



READ AND SAVE THESE INSTRUCTIONS

INSTALLATION AND OPERATION MANUAL

Desiccant dryer
Condair DA 210 - 450

Thank you for choosing Condair

Installation date (MM/DD/YYYY):

Commissioning date (MM/DD/YYYY):

Site:

Model:

Serial number:

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1 Introduction

1.1 To the very beginning

We thank you for having purchased a Condair DA 210 - 450 desiccant dryer (for short: Condair DA).

The Condair DA desiccant dryers incorporate the latest technical advances and meets all recognized safety standards. Nevertheless, improper use of the Condair DA desiccant dryer may result in danger to the user or third parties and/or damage to property.

To ensure a safe, proper, and economical operation of the Condair DA desiccant dryer, please observe and comply with all information and safety instructions contained in the present documentation as well as in the separate documentations of the components installed in the drying system.

If you have questions after reading this documentation, please contact your Condair representative. They will be glad to assist you.

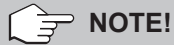
1.2 Notes on the installation and operation manual

Limitation

The subject of this installation and operation manual are the Condair DA 210 - 450 desiccant dryers in their different versions. The various options and accessories are only described insofar as this is necessary for proper operation of the equipment. Further information on options and accessories can be obtained in the respective manuals.

This installation and operation manual is restricted to the **installation, commissioning, operation, maintenance and troubleshooting** of the Condair DA desiccant dryer and is meant for **well-trained personnel being sufficiently qualified for their respective work.**

Symbols used in this manual



The catchword "NOTE" used in conjunction with the hand symbol designates important notes in this manual that require special attention.



The catchword "CAUTION" used in conjunction with the caution symbol in the circle designates notes in this operation manual that, if neglected, may cause **damage and/or malfunction of the unit or other material assets**.



The catchword "WARNING" used in conjunction with the general caution symbol designates safety and danger notes in this operation manual that, if neglected, may cause to **injury to persons**.



The catchword "DANGER" used in conjunction with the general caution symbol designates safety and danger notes in this operation manual that, if neglected, may lead to **severe injury or even death of persons**.

Safekeeping

Please safeguard this installation and operation manual in a safe place, where it can be immediately accessed. If the desiccant dryer changes hands, the documentation must be passed on to the new operator. If the documentation gets misplaced, please contact your Condair representative.

Language versions

This installation and operation manual is available in other languages. Please contact your Condair representative for information.

2 For your safety

General

Every person working with the Condair DA desiccant dryer must have read and understood this installation and operation manual before carrying out any work.

Knowing and understanding the contents of the installation and operation manual is a basic requirement for protecting the personnel against any kind of danger, to prevent faulty operation, and to operate the unit safely and correctly.

All ideograms, signs and markings applied to the Condair DA desiccant dryer must be observed and kept in readable state.

Qualification of personnel

All work described in this installation and operation manual **may only be carried out by specialist who are well trained and adequately qualified and are authorized by the customer.**

For safety and warranty reasons any action beyond the scope of this manual must be carried out only by qualified personnel authorised by the manufacturer.

It is assumed that all persons working with the Condair DA desiccant dryer are familiar and comply with the appropriate regulations on work safety and the prevention of accidents.

The Condair DA desiccant dryer may not be used by persons (including children) with reduced physical, sensory or mental abilities or persons with lacking experience and/or knowledge, unless they are supervised by a person responsible for their safety or they received instructions on how to operate the system. Children must be supervised to make sure that they do not play with the Condair DA desiccant dryer.

Intended use

The Condair DA 210 - 450 desiccant dryers are intended exclusively for **air dehumidification at atmospheric pressure** within the specified operating conditions (see [chapter 9.1 – Technical data](#)). Any other type of application, without the written consent of Condair, is considered as not conforming with the intended purpose and may lead to the Condair DA desiccant dryer becoming dangerous.

Operation of the equipment in the intended manner requires **that all the information contained in this installation and operation manual are observed (in particular the safety instructions).**

Danger that may arise from the Condair DA desiccant dryer



DANGER!
Danger of electric hazard!

The Condair DA desiccant dryer is mains powered. Live parts may be exposed when the unit is open. Touching live parts may cause severe injury or danger to life.

Prevention: Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains) and secure the unit against inadvertent power-up.



WARNING!
Risk of injury!

Inside the Condair DA desiccant dryer there are moving parts present, which can cause serious injury to hands and fingers.

Prevention: Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains) and secure the unit against inadvertent power-up.

Keep hands away from moving parts.



WARNING!
Risk of burns!

Inside the Condair DA desiccant dryer are heating element present, which can cause burns if touched.

Prevention: Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains), secure the unit against inadvertent power-up, **and wait at least 15 minutes prior to opening any service panel, allowing the heater to cool down.**

Warning signs attached to the unit

	<p>General Warning</p> <p>Draws attention to a dangerous situation that can lead to injury or serious damage to health.</p>
	<p>Electric shock</p> <p>Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains) and secure the unit against inadvertent power-up.</p>
	<p>Hot surfaces</p> <p>Hot surfaces inside the device. Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains), secure the unit against inadvertent power-up, and wait at least 15 minutes prior to opening any service panel, allowing the heater to cool down.</p>
	<p>Rotating fan blades</p> <p>Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains), secure the unit against inadvertent power-up.</p> <p>Keep hands or other body parts away from moving parts.</p>

Correct lifting and handling

Lifting or handling of components always carries an element of risk, and therefore must only be carried out by trained and qualified personnel. Ensure that any lifting operations have been fully planned and risk assessed. All equipment should be checked by a skilled and competent health & safety representative. It is the customer's responsibility to ensure that operators are trained in handling heavy goods and to enforce the relevant lifting regulations.

Preventing unsafe operation

If it is suspected that **safe operation is no longer possible**, the Condair DA desiccant dryer should immediately **be shut down and secured against accidental power-up**. This can be the case under the following circumstances:

- if the Condair DA desiccant dryer is damaged
- if the electrical installations are damaged
- if the Condair DA desiccant dryer is no longer operating correctly

All persons working with the Condair DA desiccant dryer must report any alterations to the unit that may affect safety to the owner without delay.

Prohibited modifications to the unit

No modifications must be undertaken on the Condair DA 210 - 450 desiccant dryers without the express written consent of Condair.

For the replacement of defective components use exclusively **original accessories and spare parts available** from your Condair representative.



CAUTION!

The desiccant dryer must only be used for dehumidification of air at atmospheric pressure.

Never use the desiccant dryer without the filters as the desiccant rotor can become contaminated and lose capacity.

The desiccant dryer must not be installed in areas where explosion proof equipment is required.

3 Important notes

3.1 Inspection of the delivery

After receiving:

- Inspect shipping boxes for damage. Any damages of the shipping boxes must be reported to the shipping company.
- Check packing slip to ensure all parts has been delivered. All material shortages are to be reported to your Condair supplier within 48 hours after receipt of the goods. Condair assumes no responsibility for any material shortages beyond this period
- Unpack the parts/components and check for any damage. If parts/components are damaged, notify the shipping company immediately
- Check whether the components are suitable for installation on your site according to the model key stated on the type plate

3.2 Storing/Transportation/Packaging

Storing

The Condair DA desiccant dryer must be stored in a weather-protected environment.

- Room temperature: -30°C to +40°C
- Room humidity: 0-90%RH (non condensing)

Transportation

Observe the following for transport or handling of the Condair DA desiccant dryer:

- The desiccant dryer should always stand upright on its feet.
- Never put other goods on top of the desiccant dryer.

For optimum protection always transport the unit in the original packaging and use an appropriate lifting/transporting device.



It is the customer's responsibility to ensure that operators are trained in handling heavy goods and that the operators comply with the appropriate regulations on work safety and the prevention of accidents.

Packaging

Keep the original packaging of the components for later use. In case you wish to dispose of the packaging, observe the local regulations on waste disposal. Please recycle packaging where possible.

4 Product overview

4.1 Product designation

The product designation and the most important unit data are found on the label. The label is fixed on the right side on the DA 210 - 450 desiccant dryer, next to the control panel (see example below).

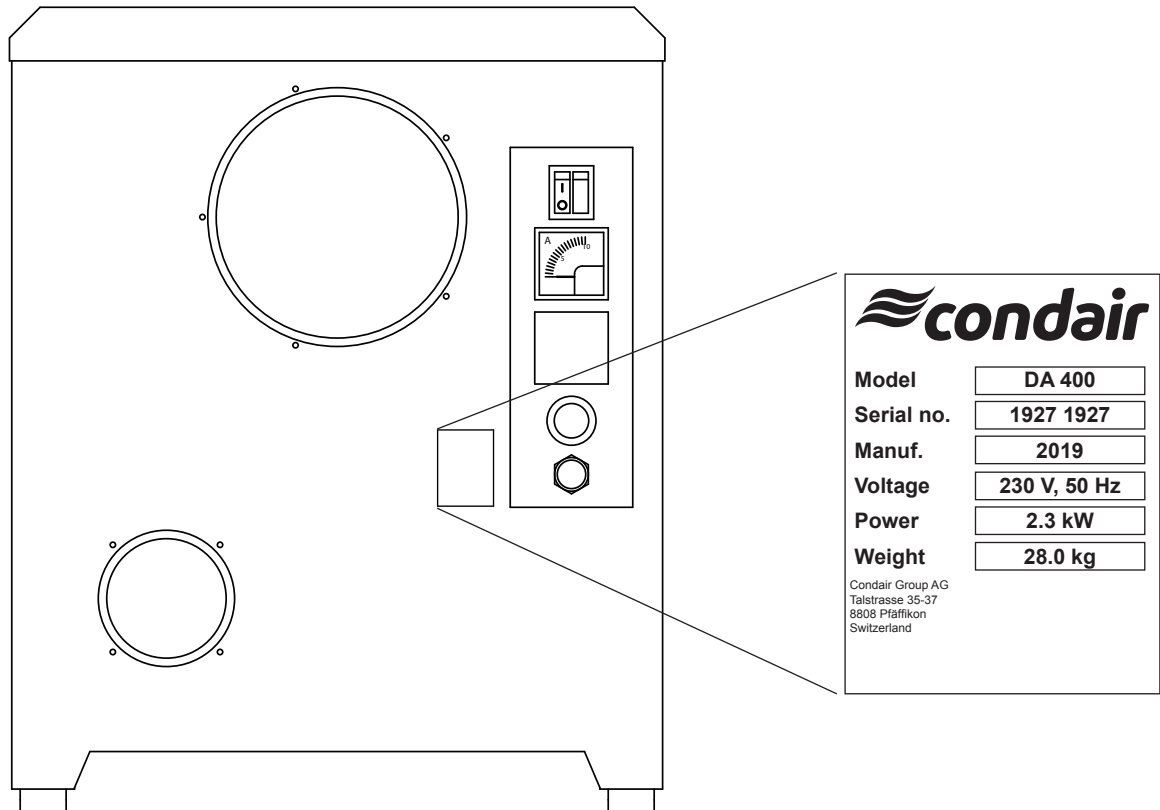


Abb. 1: Specification label

4.2 Applications

The Condair desiccant dryers is of the solid desiccant wheel type designed to dry air of atmospheric pressure. The desiccant dryer can be used for drying air of up to 100 % relative humidity (RH) with air temperatures from -30°C to +40°C.

The applications are numerous and widespread. Below are some examples:

- Controlling humidity levels in production processes.
- Drying of temperature sensitive products.
- Maintaining correct humidity in storage areas.
- Protection of equipment sensitive to corrosion.
- Controlling humidity levels in museums and archives.
- Drying after water damage and drying of buildings during construction.
- Climatic improvements in damp areas.

4.3 Method of operation

The desiccant dryer operates with two air streams. A larger air stream to be dehumidified, and a smaller air stream to exhaust the moisture out of the desiccant rotor. Two fans inside the desiccant dryer create air streams which travel through the desiccant rotor in opposite directions.

The larger air volume, the process air, passes through the slowly rotating silica gel rotor. Silica gel is a hygroscopic material adsorbing water vapour direct from the air. When passing through the rotor the humidity of the air is reduced, whilst the moisture content of the rotor material increases. On exiting the rotor the dried air is introduced into the area, or the process to be dehumidified. The adsorption process works in temperatures from -30°C to $+40^{\circ}\text{C}$.

The smaller air volume, the reactivation air, desorbs the moisture from the silica gel rotor. This reactivation air is heated by an internal heater to a temperature of approximately $+120^{\circ}\text{C}$. As the reactivation air passes through the rotor, in an opposite direction to the dry air, it will decrease the moisture content of the rotor material. The reactivation air will leave the desiccant dryer as warm, moist air, which is then exhausted out from the building.

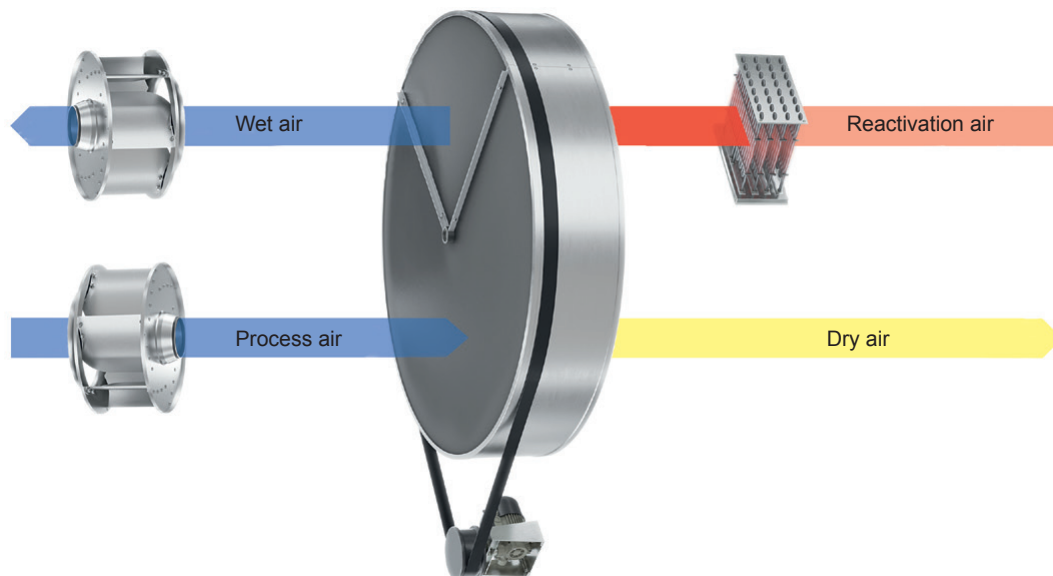


Abb. 2: Operation principle

4.4 Product description

The desiccant dryer is designed to meet the requirements of IEC protective class IP 44.

4.4.1 Casing

The casing is fabricated from 304 stainless steel. The top of the desiccant dryer has a top panel that can be removed for service access to electrical and mechanical components. All duct connections to the desiccant dryer are designed for connections to standard size spiral ducts.

4.4.2 Rotor

The desiccant dryer has a drying rotor fabricated from 82% desiccant material, 16% fibreglass and 2% acryl. The rotor has a matrix of corrugated and flat heat resistant sheets, which houses the Silica Gel desiccant agent. This matrix creates a large number of axial flutes through the rotor, which together builds up an immense surface area for moisture adsorption in a small volume. The rotor is manufactured and processed to be able to withstand moisture-saturated air without being damaged. Furthermore, the rotor will not be damaged even if the fan or the heater for reactivation should fail during operation. The rotor is according to ASTM E84 fire proof and achieved a flame-spread and smoke index of 0.

Rotor drive system

The slow rotation of the rotor is achieved by an electrical gear motor and a belt drive. The belt sits on the outer rim of the rotor and is driven by a pulley on the drive motor. An adjustable belt tension device keeps the belt in place and maintains tension to prevent belt slip. Correct operation of the drive system, and direction of rotation can be checked by opening the top panel.

The centre hub of the rotor is equipped with ball bearings. The rotor shaft is made from stainless steel. The complete rotor part can easily be removed and lifted as one piece out from the casing.

4.4.3 Filters

The desiccant dryer has two separate air filters with G3 filter class. One in the process air inlet and one in the reactivation air inlet and primarily protect the internal components of the desiccant dryer.

4.4.4 Fans for process- and reactivation air

The device is equipped with two directly driven centrifugal fans, IP54 and ISO F, installed in the device. The exact type can be found in the respective table in [chapter 10](#).

4.4.5 Heater for reactivation air

The reactivation heater is of the PTC-type (Positive Temperature Control), which can not be overheated, and gives the possibility of a stepless control for 30 - 100 % of the dehumidification capacity. This is achieved by controlling the reactivation air volume.

4.4.6 Electrical panel

The electrical components is located inside the desiccant dryer and are accessible through the top panel. Switches and indications for operation are mounted at the front of the electrical panel.

4.4.7 Operation Options

Using the operation switch on the front side of the desiccant dryer, different running options can be selected:

- 0 Dehumidifier not in operation.
- 1 Dehumidifier in operation mode.
- MAN Dehumidifier in continuous operation.
- AUTO Automatic operation by remote humidistat or other external on/off signal.

5 Installation

5.1 Installation and service access

The Condair DA 210 - 450 desiccant dryer is designed for indoor installation. The desiccant dryer should be installed horizontally.

All components in the desiccant dryer are accessible from the top of the unit. For inspection and service, a space of 500 mm must be left free above the desiccant dryer to accommodate for servicing of filters, fans and rotor.

5.2 Duct connection for permanent installation

The DA 210 - 450 desiccant dryer can be installed in the room that should to be dehumidified or in a separate room.

To obtain the best performance the outlets from the fans should be equipped with diffusers.

5.2.1 Wet air duct from the desiccant dryer

The wet air from the desiccant dryer should be exhausted to the outside. The duct should be as short as possible to minimize the chance of condensation of the wet air. This duct should slope down in angle of at least $>2^\circ$, to stop any condensed water from flowing back into the desiccant dryer. If the wet air duct is extremely long, or must be installed sloping upwards from the desiccant dryer, it should have a drainage point (3-5 mm) drilled at its lowest position.

The exhaust opening should have a coarse wire net.

A damper should be installed in the wet air duct to enable correct setting of the reactivation air volume during commissioning.

5.2.2 Reactivation air into the desiccant dryer

The reactivation air duct into the desiccant dryer should be as short as possible. The intake opening of the duct should have a coarse wire net, to stop foreign objects from entering the desiccant dryer. No insulation is needed and the duct can slope up- or downwards. In some installations, as an alternative, the reactivation air can be taken from the installation room, for this alternative no duct connection is needed.

5.2.3 Process- and dry air with the desiccant dryer installed in the dehumidified room

When the desiccant dryer is installed in the dehumidified room space it would normally take the process air direct from the room without any duct system, with only a protection net for the inlet required. The dry air outlet would normally have a duct system designed for distribution of the dry air in the building.

5.2.4 Process- and dry air with the desiccant dryer installed outside the dehumidified room

When the desiccant dryer is installed in a separate plant room all inlet and outlet openings are usually ducted.

The desiccant dryer takes the process air as ambient air or as pre-treated air from an HVAC, or alternatively as return air from the dehumidified room. The dry air from the desiccant dryer can be connected for posttreatment or ducted back to the dehumidified room, e.g. post cooler or filter.

A damper can be installed in the process air duct, enabling correct commissioning of the dry air volume. For a solution with a speed-controlled fan, please contact your Condair representative.

5.2.5 Duct connection for basement installation

If the DA desiccant dryer should be installed in the basement it is sometimes desirable to achieve a slight negative pressure in the space to prevent odours from penetrating up into the building. In these circumstances the reactivation air is taken directly from the basement and the wet air is exhausted out from the basement. This method of installation will create a small negative pressure. The ducts should be installed according to "Duct connections for permanent installation".

5.2.6 Temporary installation

With temporary installations for water damage or building drying, flexible plastic ducts would normally be used instead of the spiral duct type. The drying method differs depending on situation and construction to be dried. The complete room could be dehumidified, or just the damaged part. For the later option plastic sheet is used to cover the damaged area, and the dry air is supplied under the sheet. For both options the wet air must be exhausted out from the building via flexible duct, or alternatively connected to the general exhaust ventilation system for the building.

5.3 Electrical installation

See [chapter 11 – Electrical wiring diagrams](#).

6 Commissioning

On initial start-up, the following steps should be taken in this order:

1. Ensure that the external isolation switch is isolating the unit from the mains, or that the power plug is disconnected.
2. Select the OFF position on the main switch (orange) at the front of the desiccant dryer.
3. Open the service panel on the top of the desiccant dryer and ensure no foreign objects are left inside the unit or in the electrical compartment.
4. Check that air filters are installed and clean.
5. Rotate the fan impellers by hand and make sure they can move freely.
6. Ensure that the dry and wet air dampers are open, and that ducts are clean and free of blockages.
7. Ensure that the mains supply fuse is suitably rated and that the fuse is of a slow kind.
8. Connect the desiccant dryer to the main electrical supply by turning the isolation switch to ON, or alternatively connect the power plug to the socket.
9. Select the MAN position on the operation switch (black) of the desiccant dryer. Switch the main switch (orange) to the ON position for 3-4 seconds. Check that the rotor is slowly rotating, the fans are starting, and that the orange lamp in the main switch lights up. Turn OFF the desiccant dryer.
10. Mount the service panel and ensure it seals properly to the casing.
11. The desiccant dryer is now ready for operation.
12. Start the desiccant dryer and check that the unit is operating at the correct air volumes. An indication of correct operation is if the ammeter on the front of the desiccant dryer indicates approximately:
 - DA 210: 4 – 5 A
 - DA 400: 10 A
 - DA 450: 14,0 – 14,5 A
13. From the factory the desiccant dryer is electrically wired in such a way that when operating in AUTO mode, the controls operate the complete unit to start or stop. By shifting one terminal connection in the electrical panel the operation mode can be altered to operate the process air fan continuously. The controls will then only operate the heater on /off, depending on the signal from the humidistat or other external signal.

7 Maintenance

7.1 Important notes on maintenance

Qualification of personnel

All maintenance work must be carried out only by well qualified and trained personnel authorised by the owner. It is the owner's responsibility to verify proper qualification of the personnel.

General note


The instructions and details for maintenance work must be followed and upheld.

Only the maintenance work described in this documentation may be carried out.

Only use original Condair spare parts to replace faulty parts.

Safety

Some maintenance work requires removal of the unit covers. Please note the following:

 **DANGER!**
Danger of electric hazard!

The Condair DA desiccant dryer is mains powered. Live parts may be exposed when the unit is open. Touching live parts may cause severe injury or danger to life.

Prevention: Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains) and secure the unit against inadvertent power-up.

 **WARNING!**
Risk of injury!

Inside the Condair DA desiccant dryer there are moving parts present, which can cause serious injury to hands and fingers.

Prevention: Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains) and secure the unit against inadvertent power-up.

Keep hands or other body parts away from moving parts.

 **WARNING!**
Risk of burns!

Inside the Condair DA desiccant dryer are heating element present, which can cause burns if touched.

Prevention: Before carrying out any work set the Condair DA desiccant dryer out of operation (switch off the unit, disconnect it from the mains), secure the unit against inadvertent power-up, **and wait at least 15 minutes prior to opening any service panel, allowing the heater to cool down.**

The maintenance intervals for the desiccant dryer depend on the surrounding environment and installation site. Recommended maintenance intervals could therefore differ from one installation to another. Incorrect maintenance and service may result in reduced dehumidification capacity.

7.2 Filters

The desiccant dryer is equipped with two separate filter banks, one for the process air and the other for the reactivation air. The filters are positioned at the respective inlets and will clean the air prior to entering the desiccant dryer.

Intervals for cleaning or replacement of the filters will be determined by the amount of dust and particles in the air at the installation site.

We recommend that the filter is checked at least once a month, at least for the first year of a new installation.



CAUTION!

Never operate the desiccant dryer without the filters, as the rotor can be damaged by dust.

7.3 Rotor

The rotor is maintenance free. However should it be necessary to clean the rotor the first choice should be careful use of compressed air. With severe contamination, the rotor can be washed with water.

Cleaning with water is no routine matter; please contact your Condair representative.

Check the rotor bearing and the rotor surface once a year.

7.4 Electrical motors

The electrical motors are equipped with ball bearings. The bearings are designed to last the life of the motor and therefore no maintenance is required.

Check the motors once a year for any abnormal sound.

7.5 Heater

The reactivation electric heater does not need maintenance, but should be checked twice a year for any dust or mechanical damage to the heating rods. Clean with a soft brush, or vacuum clean with dust. Gentle use of compressed air is another alternative.

7.6 Rotor drive belt

Check the belt tensioning at regular intervals. Adjust when needed by moving the tensioning support wheel closer to the desiccant rotor.

7.7 General summary of maintenance intervals

	Filter	Rotor bearing	Motors	Rotor drive	Heater	Seals
As required	x					
Every 6th month				x	x	x
Every 12th month		x	x			

8 Troubleshooting

Malfunction	Possible cause of trouble	Corrective action
None, or reduced dehumidification capacity	Filter dirty.	Clean or replace filters.
	Electrical heater faulty.	Check fuses.
	Airflow reduced.	Check openings and dampers.
	No rotation of rotor.	Check belt tensioning or PLC alarms.
	Internal leakage in unit.	Check seals and springs.
	Altered air volumes.	Measure and check air volumes.
	Altered reactivation temperature.	Check reactivation heater.
	Air leakage.	Check panels and check seals.
Circuit breaker or fuse faulty	Fan faulty.	Check fans and motors.
	Too large air volume.	Check air volumes and dampers.
	Rotor does not rotate.	Check drive motor and drive belt.
	Reactivation heater faulty.	Check reactivation heater.
Desiccant dryer does not start	No control circuit.	Check control fuses.
	Faulty control signal.	Check external start/stop signal
	Phase fault.	Check main fuses.
	Fuse for controls faulty.	Check electrical components.
Rotor does not rotate	Drive belt is slipping.	Check belt tensioning.
	Drive belt broken or worn.	Replace drive belt.
	Rotor jammed.	Check centre shaft, rim of rotor.
	Drive motor faulty.	Replace complete gear motor.
No dry- or wet air volume	Filter dirty.	Clean or replace filters.
	Fan faulty.	Check fan, motor and impeller.
	Phase fault.	Check main fuses and phase sequence.
	Ducts blocked.	Check dampers and ducts.

9 Product specification

9.1 Technical data

		DA 210	DA 400	DA 450
Drying capacity at 20°C - 60%rh	kg/h	0.6	1.5	2.2
Nominal dry air volume	m ³ /h	210	400	450
Nominal reactivation air volume	m ³ /h	40	120	120
Nominal ext. pressure processair	Pa	Free blowing	60	Free blowing
Nominal ext. pressure reactivationair	Pa	Free blowing	Free blowing	Free blowing
Electrical connected load	kW	1.1	2.3	3.5
Electrical load – reactivation heat register	A	4.8	10.0	15.2
Operation range — temperature	°C	-30 to +40		
Operation range — humidity	%rF	0 to 100		
Voltage supply	V/Ph/Hz	230/1/50		
Connection diameter process air	mm	125	160	160
Connection diameter dry air	mm	100	160	160
Connection diameter reactivation air	mm	63	80	80
Connection diameter wet air	mm	63	80	80
Filter class process air		G3		
Filter class reactivation air		G3		
Dimensions (H x W x D)	mm	457 x 315 x 315	525.5 x 504 x 428	
Max noise level 1)	dB(A)	53.3	62.2	63.0
Weight	kg	16.5	28.0	31.0

¹⁾ Maximum value at 1 m distance, with applied ducting



NOTE!

Valid only for standard units, with standard fans, air-flows and standard reactivation heat power.

9.2 Dimensions Condair DA 210

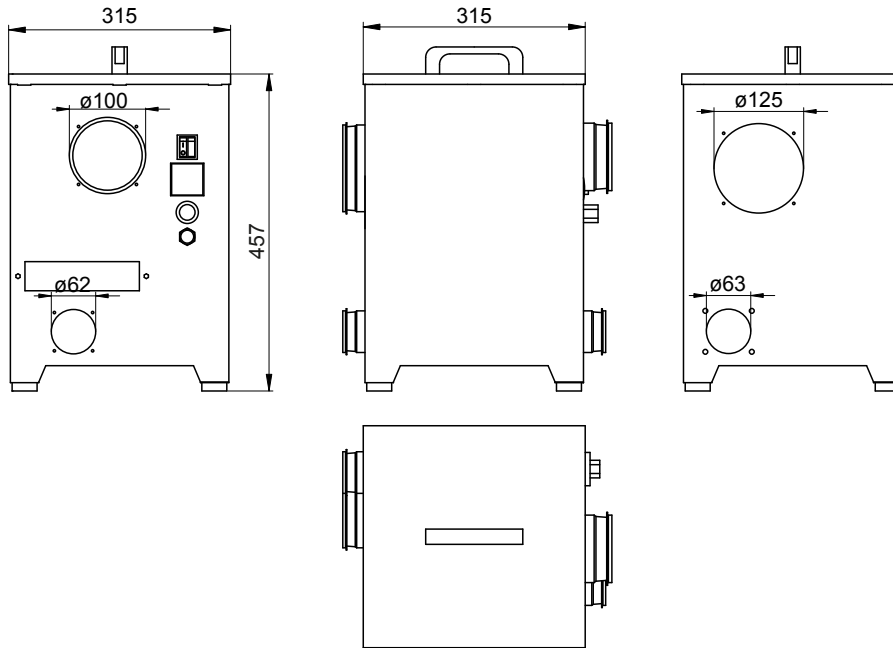


Abb. 14: Dimensions Condair DA 210 (dimensions in mm)

9.3 Dimensions Condair DA 400 - 450

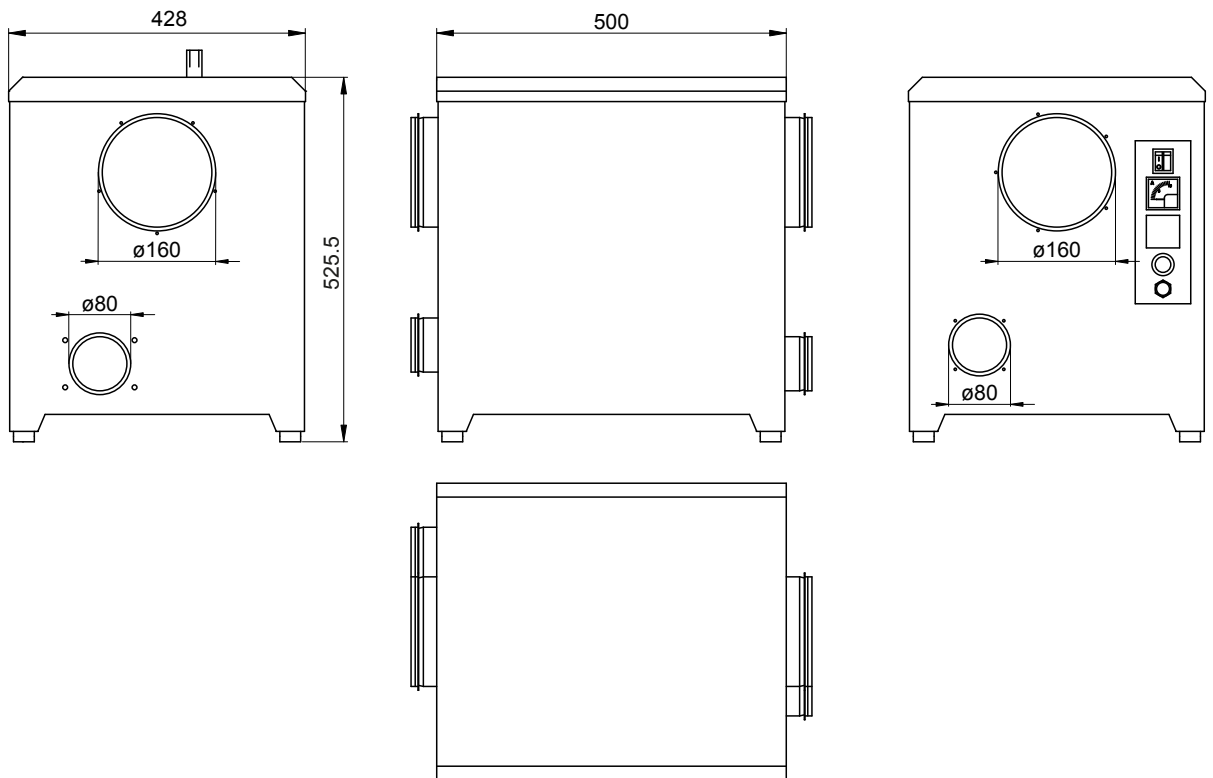
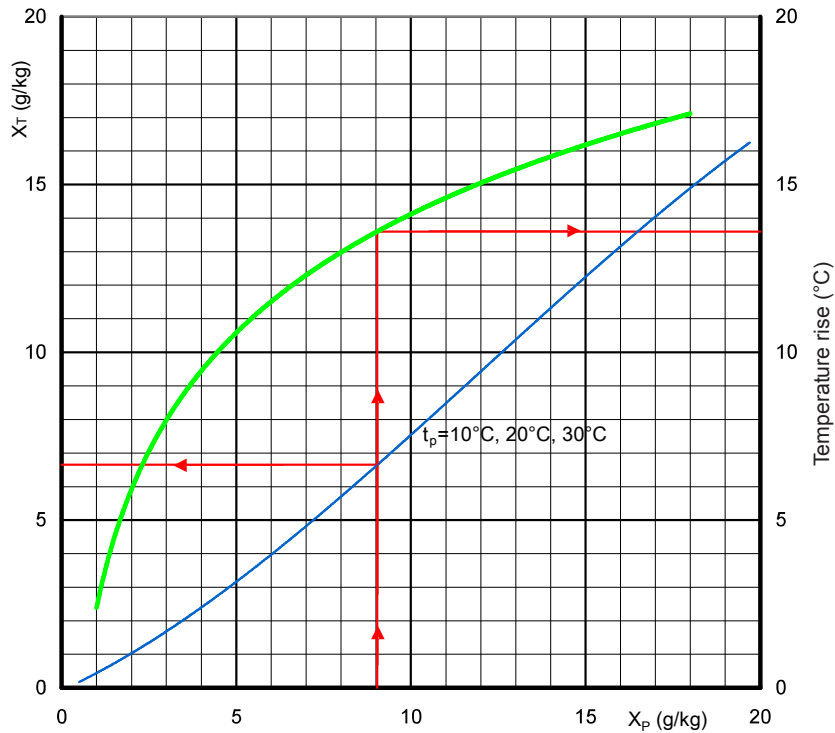


Abb. 15: Dimensions Condair DA 400 - 450 (dimensions in mm)

9.4 Performance charts Condair DA 210



Example:

Given process air: $X_p = 9,0$ g/kg, $t_p = +20^\circ\text{C}$

Dry air: $X_T = 6.6$ g/kg, $t_T = 20 + 13.6 = 33.6^\circ\text{C}$

X_p = Absolute humidity process air

X_T = Absolute humidity dry air

t_p = Temperature process air

t_T = Temperature dry air

Abb. 16: Performance chart DA 210

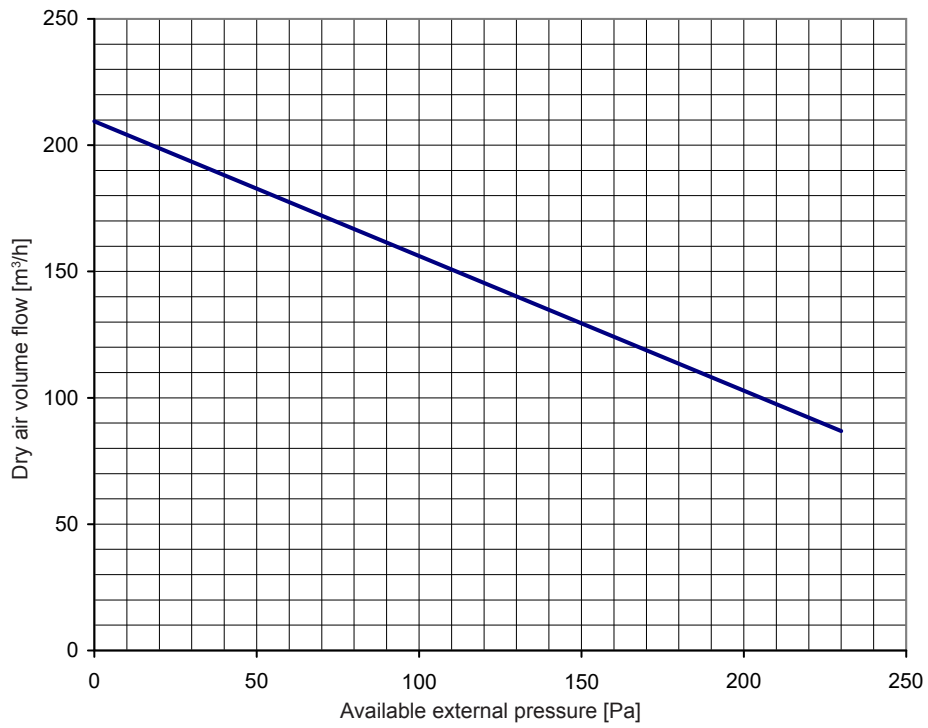


Abb. 17: Dry air volume flow Condair DA 210

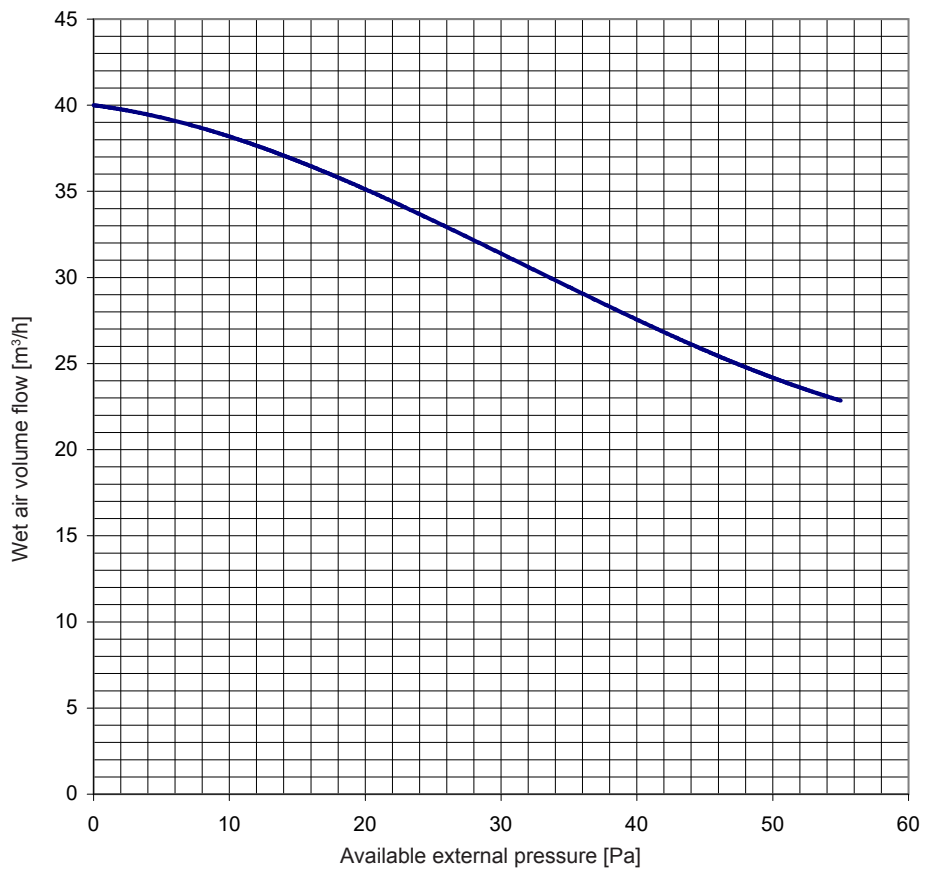
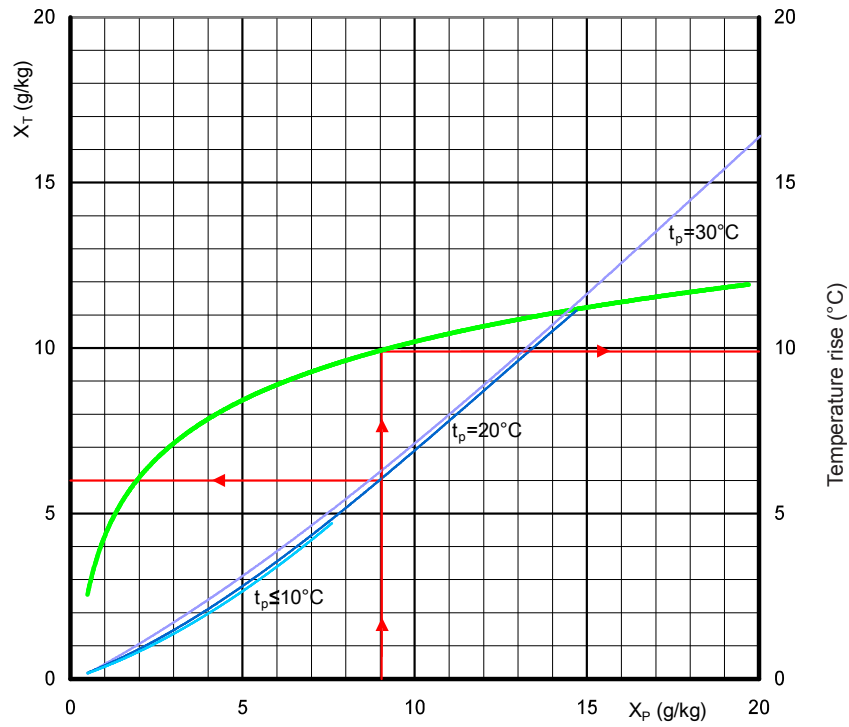


Abb. 18: Wet air volume flow Condair DA 210

9.5 Performance charts Condair DA 400



Example:

Given process air: $X_p = 9.0$ g/kg, $t_p = +20^\circ\text{C}$

Dry air: $X_T = 6.0$ g/kg, $t_T = 20 + 9.9 = 29.9^\circ\text{C}$

X_p = Absolute humidity process air

X_T = Absolute humidity dry air

t_p = Temperature process air

t_T = Temperature dry air

Abb. 19: Performance chart DA 400

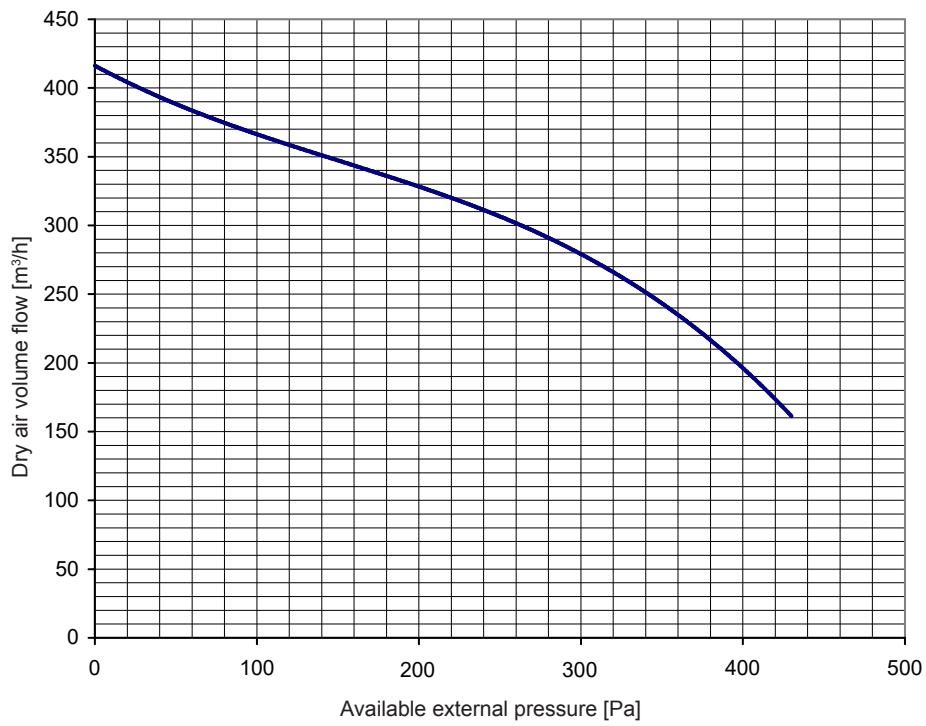


Abb. 20: Dry air volume flow Condair DA 400

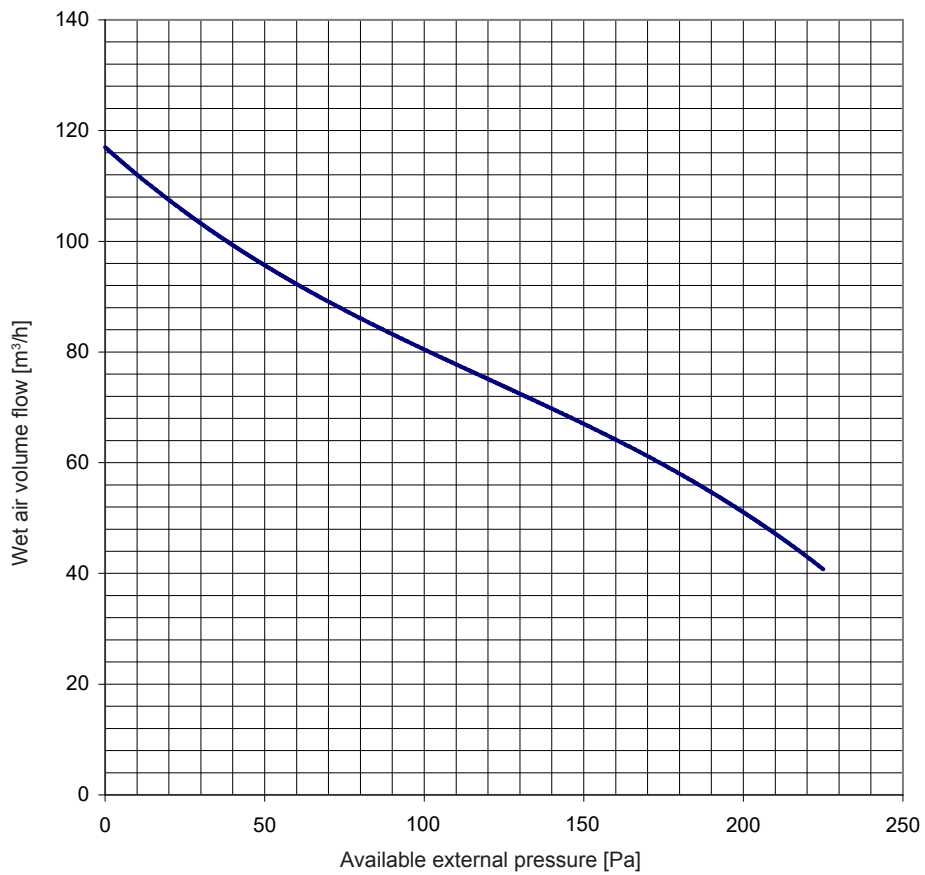
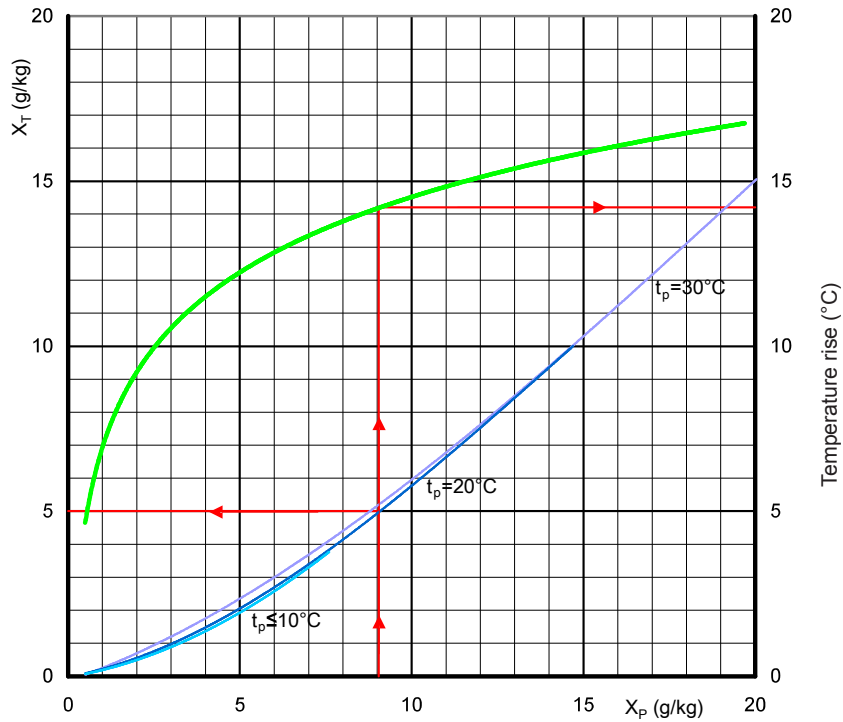


Abb. 21: Wet air volume flow Condair DA 400

9.6 Performance charts Condair DA 450



Example:

Given process air: $X_p = 9,0$ g/kg, $t_p = +20^\circ\text{C}$

Dry air: $X_T = 6.0$ g/kg, $t_T = 20 + 14.2 = 34.2^\circ\text{C}$

X_p = Absolute humidity process air

X_T = Absolute humidity dry air

t_p = Temperature process air

t_T = Temperature dry air

Abb. 22: Performance chart DA 450

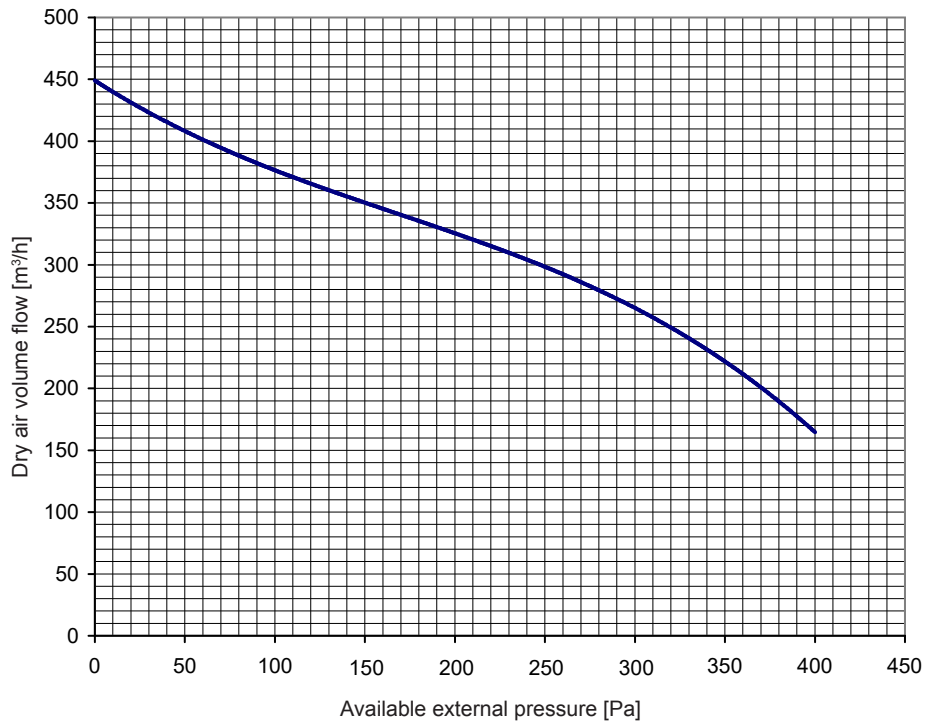


Abb. 23: Dry air volume flow Condair DA 450

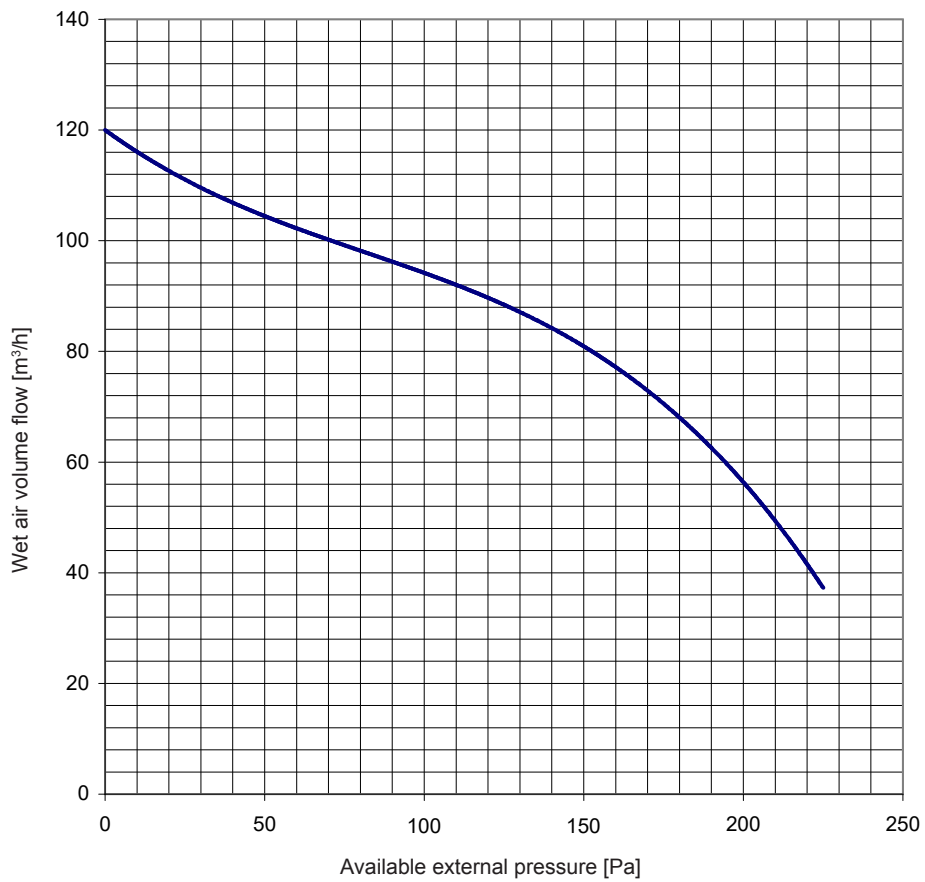


Abb. 24: Wet air volume flow Condair DA 450

10 Spare parts

10.1 Spare parts Condair DA 210

Part	Part No.	Technical specification	Numbers installed	Numbers of recommended spare parts
Drive motor		Gearmotor 230-240 V 50 Hz 3 rpm low temp grease	1	1
Belt pulley		HTD 20-5M-09 for timing belt	1	
Drive belt		800-5M-09 timing belt	1	
Process air fan		G2E 140-AE77-B9	1	
Capacitor for process air fan		2 µF 400 V	1	
Reactivation air fan		G2E-085-AAD1-05	1	
Capacitor reactivation air fan		1 µF 400 V		
Heating element		HF213U44D1 - 230V	1	1
Wet air duct		Heat resistant flexcord Ø63		
Rotor		Rotor 210	1	
Process air filter		AAF R29 EN779:G3 210 x 250 mm	1	3
Reactivation air filter		AAF R29 EN779:G3 150 x 160 mm	1	3
Switch		2x1 pol. electric switch	1	
Cable		H07RNF/3 x 1,5	1	

10.2 Spare parts Condair DA 400

Part	Part No.	Technical specification	Numbers installed	Numbers of recommended spare parts
Drive motor		Gearmotor 230-240 V 50 Hz 4 rpm low temp grease	1	1
Capacitor for drive motor		0,22 µF 700V	1	
Belt pulley		HTD 5M, Z=20	1	
Drive belt		HTD 1270-5M09	1	
Process air fan		G2E 160-AY47-01	1	
Capacitor for process air fan		6 µF 400 V	1	
Capacitor for reactivation air fan		G2E 120-AR77-90	1	
Heating element		HRKK04/50/22 - 230 V	2	1
Wet air duct		Heat resistant flexcord Ø80		
Rotor		Rotor 400	1	
Process air filter		CM360 220 x 420 mm	1	3
Reactivation air filter		CM360 220 x 195 mm	1	3
Switch		2x1 pol. electric switch	1	
Ammeter		RQ48E 15A	1	
Cable		H07RNF/3 x 2,5	1	

10.3 Spare parts Condair DA 450

Part	Part No.	Technical specification	Numbers installed	Numbers of recommended spare parts
Drive motor		Gearmotor 230-240 V 50 Hz 3 rpm 7,8 W, low temp grease	1	1
Capacitor for drive motor		0,5 μ F	1	
Belt pulley		HTD 5M, Z=20	1	
Drive belt		HTD 1270-5M09	1	
Process air fan		G2E 160-AY47-01	1	
Capacitor for process air fan		6 μ F 400 V	1	
Reactivation air fan		G2E 120-AR77-90	1	
Heating element		HRKK04/50/22 - 230 V	2	1
Wet air duct		Heat resistant flexcord \varnothing 80	1	
Rotor		Rotor 450	1	
Process air filter		AAF R29 EN779:G3 220 x 420 mm	1	3
Reactivation air filter		AAF R29 EN779:G3 220 x 195 mm	1	3
Switch		2x1 pol. electric switch	1	
Ammeter		25A	1	
Cable		H07RNF/3 x 2,5	1	

11 Electrical wiring diagrams

11.1 Electrical wiring diagram Condair DA 210

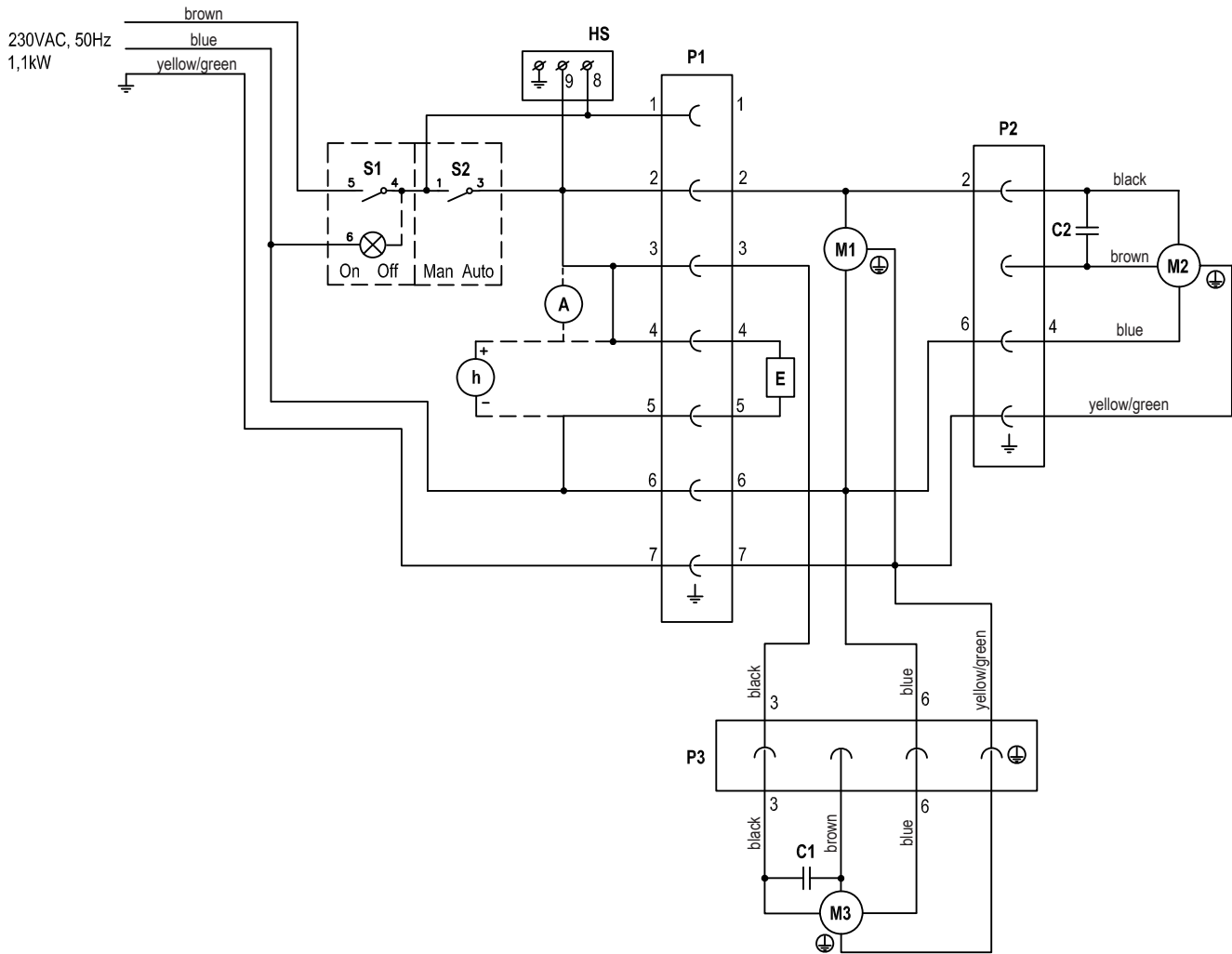


Abb. 25: Electrical wiring diagram Condair DA 210

Pos.	Component	Type	Number	Manufacturer
M1	Gear motor 230 V, 50 Hz, 3 rpm	823055BJ	1	Crouzet AB
M2	Radial fan, G2E 140-AE77-B9	46701140	1	EBM
C1	Capacitor, 1 µF 400 V		1	EBM
C2	Capacitor, 2 µF 400 V		1	EBM
M3	Radial fan, G2E-085-AA01-05		1	EBM
S1/S2	Toggle switch 2x1-pol. bl/or	255036	1	Orbitus Ind.komp.
A	Ammeter		*	Tälje mätinstrum.
E	Heater, 230 V	HF213U44D1	1	Victon Ltd.
P1	Terminal male 7-pin		1	Weidmüller AB
P1	Terminal, female 7-pin		1	Weidmüller AB
P2/P3	Terminal male 4-pin		2	Weidmüller AB
P2/P3	Terminal female 4-pin		2	Weidmüller AB
-	Blind panel, 48 x 48	11110	1	Tälje mätinstrum.
-	Blind plug, 22,0-25,5 mm	P208/4	1	OEM Component
-	Cord, H07RNF/3G1.5/3,5m	2440032	1	OEM Component
h	Runtime meter		*	
HS	Humidistat plug connection		*	

* Option

Optional operation method when controlled by humidistat

If continuous operation of the fan is requested, and the humidistat should control only a reactivation heater, shift wire 2-2 from terminal P1:2 to terminal P1:1.

Connection of an optional ammeter

An optional ammeter is connected to terminals P1:3 and P1:4 instead of the cable.

Connection of humidistat and air cooled condensator

Connect the humidistat to terminals P4:8-9.

Connect the condenser fan to terminals P1:3 and P1:6.

11.2 Electrical wiring diagram Condair DA 400

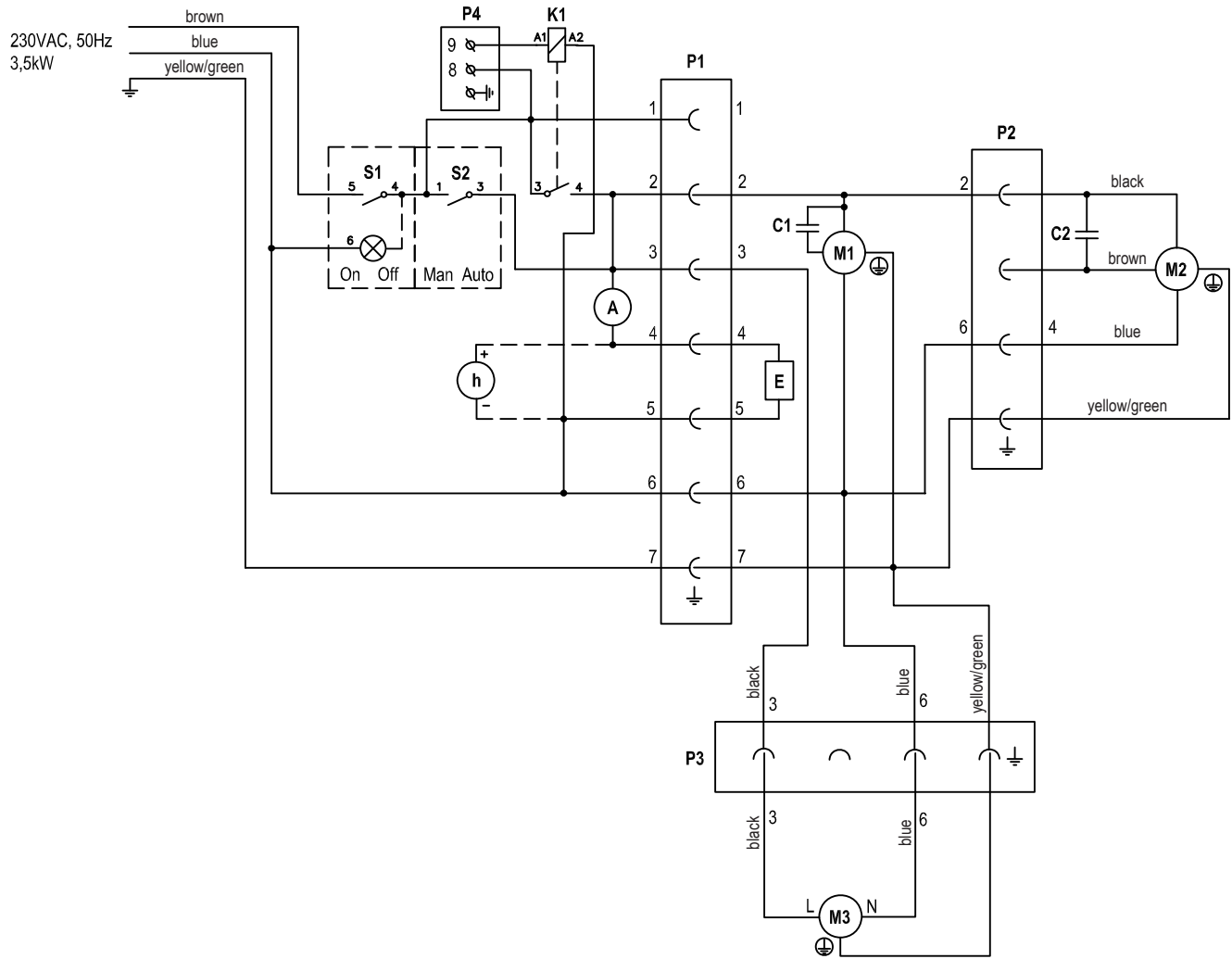


Abb. 26: Electrical wiring diagram Condair DA 400

Pos.	Component	Type	Number	Manufacturer
M1	Gear motor 230 V, 50 Hz, 4 rpm	823055BJ	1	Crouzet AB
M2	Radial fan, R2E 160-AY47-01	46701140	1	ebmpapst
C1	Capacitor, 0,1 µF 400 V		1	ebmpapst
C2	Capacitor, 6 µF 400 V		1	ebmpapst
M3	Radial fan, G2E 120-AR77-90		1	ebmpapst
S1/S2	Toggle switch 2x1-pol. bl/or	255036	1	Orbitus Ind.komp.
K1	Relay 230 V 30 A	RMC 05730	1	Schrack
A	Ammeter	RQ48E 15A	*	Tälje mätinstrum.
E	Heater, 230 V	HRKK04/50/22	1	DBK
P1	Terminal male 7-pin	PC 4/7-ST-7, 62	1	Phoenix Contact
P1	Terminal, female 1-pin	PCVK 4-7, 62	7	Phoenix Contact
P2/P3	Terminal male 4-pin	sls 5.08/4B sn or	2	Weidmüller AB
P2/P3	Terminal female 4-pin	sls 5.08/4 sn or	2	Weidmüller AB
P4	Terminal block 2-pin	MA2,5/5	1	-
-	Blind panel, 48 x 48	11110	1	Tälje mätinstrum.
-	Blind plug, 22,0-25,5 mm	P208/4	1	OEM Component
-	Cord, H07RNF/3 x 2.5/3,5m	2440032	1	OEM Component
h	Runtime meter		*	
HS	Humidistat plug connection		*	

* Option

Optional operation method when controlled by humidistat

If continuous operation of the fan is requested, and the humidistat should control only a reactivation heater, shift wire 2-2 from terminal P1:2 to terminal P1:1.

Connection of humidistat and air cooled condensator

Connect the humidistat to terminals P4:8-9.

Connect the condenser fan to terminals P1:3 and P1:6.

11.3 Electrical wiring diagram Condair DA 450

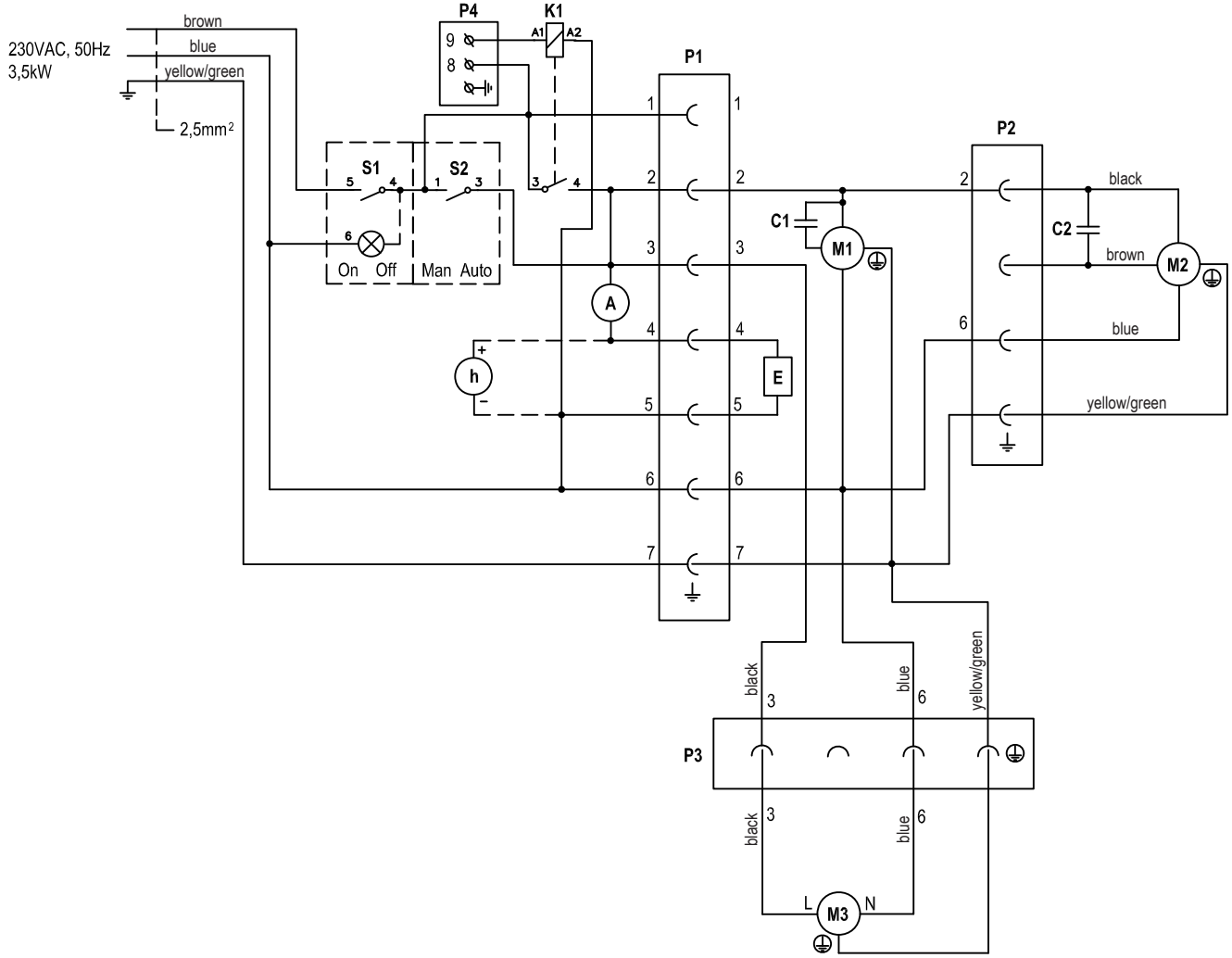


Abb. 27: Electrical wiring diagram Condair DA 450

Pos.	Component	Type	Number	Manufacturer
M1	Gear motor 230 V, 50 Hz, 3 rpm, 7,8 W	SGM65/30-4	1	Rotek
M2	Radial fan, R2E 160-AY47-01	46701140	1	ebmpapst
C1	Capacitor, 0,5 µF 400 V	-	1	-
M3	Radial fan, G2E 120-AR77-90		1	ebmpapst
S1/S2	Toggle switch 2x1-pol. bl/or	255036	1	Orbitus Ind.komp.
K1	Relay 230 V 30 A	RMC 05730	1	Schrack
A	Ammeter	25A IP54	*	Tälje mätinstrum.
E	Heater, 230 V	HRKK04/50/22	2	DBK
P1	Terminal male 7-pin	PC 4/7-ST-7, 62	1	Phoenix Contact
P1	Terminal, female 1-pin	PCVK 4-7, 62	7	Phoenix Contact
P2/P3	Terminal male 4-pin	sls 5.08/4B sn or	2	Weidmüller AB
P2/P3	Terminal female 4-pin	sls 5.08/4 sn or	2	Weidmüller AB
P4	Terminal block 2-pin	MA2,5/5	1	-
-	Blind panel, 48 x 48	11110	1	Tälje mätinstrum.
-	Blind plug, 22,0-25,5 mm	P208/4	1	OEM Component
-	Cord, H07RNF/3 x 2.5/3,5m	2440032	1	OEM Component
h	Runtime meter		*	
HS	Humidistat plug connection		*	

* Option

Optional operation method when controlled by humidistat

If continuous operation of the fan is requested, and the humidistat should control only a reactivation heater, shift wire 2-2 from terminal P1:2 to terminal P1:1.

Connection of humidistat and air cooled condensator

Connect the humidistat to terminals P4:8-9.

Connect the condenser fan to terminals P1:3 and P1:6.

12 EU declaration of conformity

EU declaration of conformity

Condair Group AG
Talstrasse 35-37
8808 Pfäffikon SZ
Switzerland

declare under own responsibility that the product:

Condair Dehumidifier DA 160, DA 250, DA 440, DA 210, DA 400 and DA 450

which is detailed in this declaration complies to the following harmonized European standards and technical specifications:

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 61000-6-3:2007/A1:2011/AC:2012	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
EN 61000-6-2:2005/C1:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-3-2:2014	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3:2013	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

according to conditions in directive:

2006/42/EC	Machinery Directive
2009/125/EC	Ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW
2014/30/EU	Electromagnetic Compatibility (EMC) Directive

Pfäffikon 2018-12-12

The manufacturer:



Condair Group AG
Robert Merki



CONSULTING, SALES AND SERVICE:



CH94/0002.00

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The Condair logo features a stylized graphic of three wavy lines to the left of the word 'condair' in a bold, lowercase, sans-serif font.