

IMPORTANT! Read and save these instructions. This manual to be left with the equipment.

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

Condair DA Series Desiccant Dryer
Condair **DA-Series**

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 Getting Started

Thank you for purchasing the Condair DA Series Desiccant Dryer.

The Condair DA Series Desiccant Dryer incorporates the latest technical advances and meets recognized safety standards. Improper use of the Condair DA Series Desiccant Dryer may result in danger to the user or third parties, and/or damage to property.

To ensure safe, proper, and efficient operation of the Condair DA Series Desiccant Dryer, please observe and comply with all information and safety instructions contained in this manual, as well as all relevant documentation of components of the installed dehumidification system.

If you have additional questions, please contact your Condair representative. They will be glad to assist you.

1.2 General

1.2.1 Limitations of the Manual

The subject of this manual is the Condair DA Series Desiccant Dryer in its different versions. The various options and accessories that are described in this manual pertain to the proper operation of the equipment. Additional information and instructions are supplied with the options and accessories. It is intended as a supplement to the installation, operation and maintenance manuals.

This manual is restricted to the installation, operation, and maintenance of the Condair DA Series Desiccant Dryer. This manual is intended for competent personnel suitably qualified for their respective tasks. The specifications are supplemented by various separate items of documentation (such as the parts list). Where necessary, appropriate cross-references are made to these publications in the specification.

1.2.2 Symbols Used in This Manual



CAUTION!

The word "CAUTION" in conjunction with the general caution symbol is used to provide safety instructions that, if neglected, may cause damage or malfunction of the unit, or damage to property.



WARNING!

The word "WARNING" in conjunction with the general warning symbol is used to provide safety instructions that, if neglected, may cause injury to personnel. Other specific warning symbols may also be used in place of the general symbol.



DANGER!

The word "DANGER" in conjunction with the general danger symbol is used to provide safety instructions that, if neglected, may cause severe injury to personnel or even death. Other specific danger symbols may also be used in place of the general symbol.

1.2.3 Storage of Manual

Keep this manual in a place where it is safe and readily accessible. If the equipment is moved to another location, please ensure that it remains with the equipment.

If the manual is lost or misplaced, please contact Condair for a replacement.

1.3 Receiving and Storage

1.3.1 Inspection

After receiving the shipment, inspect the goods as follows:

- Inspect the shipping boxes for damage. Report any shipping box damages to the shipping company without delay.
- Check the goods against the packing slip to ensure that all items have been delivered. Report any shortages to your Condair representative within 48 hours of receipt of the goods. Condair does not accept responsibilities for any shortages beyond this period.
- Unpack the parts/components and check for any damage. If parts/components are damaged, notify the shipping company immediately.
- Verify the model type on the specification label to ensure that it is suitable for your installation. Refer to ["Model Designation" on page 13](#).

1.3.2 Storage, Packaging, and Transportation

Storage

Store the Condair DA Series Desiccant Dryer in its original packaging inside a protected area that meets the following requirements until it is installed, or if it needs to be stored for an extended period of time:

- Room temperature: -34 to 104 °F (-30 to 40 °C)
- Room humidity: 0 to 90% RH (non-condensing)

Transportation

For optimum protection always transport the unit and components in their original packaging, and use appropriate lifting/transporting devices (ex. forklift).

Lifting or handling must be carried out by trained and qualified personnel. Ensure that lifting has been fully planned and assessed for possible risks, and that equipment is checked and operated by a skilled operator. It is the customer's responsibility to ensure that operators are fully trained to handle heavy goods and to enforce any applicable lifting regulations.

The unit should be protected from rain and snow, and stand upright.

Avoid placing other goods on top of the unit.

Packaging

Keep the original packaging of the unit/components for later use.

If the packaging needs to be disposed, observe local regulations on waste disposal. Please recycle packaging where possible.

1.4 Safety Precautions

IMPORTANT! Never use the dehumidifier without the filters. The filters help prevent contamination of the desiccant rotor and reduces capacity losses. Missing filters will lead to premature failure of the heaters and desiccant wheel.

The dehumidifier is **NOT** rated to be installed in rooms that require explosion-proof equipment.

The service panel on the dehumidifier should remain closed at all times, except during servicing. Disconnect the unit from the supply source before servicing the unit.

The dehumidifier is designed to meet IEC IP 44 requirements.

Regard all safety precautions described in this manual. Refer to [*"For your Safety" on page 9.*](#)

1.5 Compliance

Follow all local guidelines and regulations regarding the installation and operation of the unit; this includes (and not limited to) mounting, plumbing, water, gas, ventilation, and electrical connections.

Please consult your local Condair representative to learn more.

2 For your Safety

General

Every person who is tasked with the installation, operation and/or maintenance of the Condair DA Series Desiccant Dryer must read and understand this manual, as well as any respective installation, operation and/or maintenance manuals before performing any work. Knowing and understanding the contents of these manuals is a basic requirement for protecting personnel against any kind of danger, preventing faulty operation, and operating the unit safely and correctly.

All labels, signs and markings applied to unit must be observed, kept in a readable state, and NOT removed or altered.

Personnel Qualifications

All procedures described in this document must only be performed by personnel who are adequately qualified, familiar with the unit, well trained, and are authorized by the customer.

For safety and warranty reasons, any activity beyond the scope of this manual must only be performed by qualified personnel authorized by Condair.

The unit may not be used by persons (including children) with reduced physical, sensory, or mental abilities, or persons lacking experience and knowledge – unless they are being supervised by a person responsible for their safety, or have received proper instruction on the operation of the system.

All personnel working with the Condair DA Series Desiccant Dryer unit must be familiar with, and comply with the appropriate regulations on workplace safety and prevention of accidents.

Intended Use

The Condair DA Series Desiccant Dryer is intended exclusively for air dehumidification and product drying using Condair-approved parts within specified operating conditions (such as dehumidification of air at atmospheric pressure). Refer to [*"Technical Specification" on page 16*](#) in for details. Any other type of application, without the express written consent of Condair, is considered to be NOT conforming to its intended purpose, and may lead to dangerous operation and will void the warranty.

In order to operate the equipment in the intended manner all information contained in this manual, in particular the safety instructions, must be observed closely.

Safety Precautions that Must be Observed



DANGER! **Risk of electric shock!**

The unit is mains powered. Using the On/Off button on the touch screen to shut down the unit will not remove power from the unit. Live parts may be exposed when the access panels or doors are removed. Touching live parts may cause severe injury or even death.

Prevention: Before performing any work inside the dehumidifier, shut down the dehumidifier properly, as described in ["Shutting Down the Unit" on page 43](#). The unit must be connected to the mains only after all mounting, installation, and maintenance work has been completed, checked for correct workmanship, and the access panels/doors are closed and fastened securely. Secure the unit against accidental powerup.

Only qualified personnel should perform maintenance or repairs on the unit.

Follow any lockout procedures when servicing the unit.



WARNING! **Risk of severe burns from contact with hot vapors!**

The dehumidifier has an internal heater that heats the air to over 248 °F (120 °C), and can dispel wet air with temperatures over 176 °F (80 °C). Contact with hot vapors can result in severe burns.

Prevention: Never perform any work while the dehumidifier is operating. Shut down the dehumidifier and wait for the components to **cool down (at least 15 min)** before working on the system. Wear appropriate personal protective equipment when working near hot vapors. Refer to ["Shutting Down the Unit" on page 43](#) before fixing any leaks in the system.



WARNING! **Risk of severe burns from contact with hot surfaces!**

The components in the dehumidifier get very hot during operation. Some components in the dehumidifier can be over 248 °F (120 °C). Contact with hot surfaces can result in severe burns.

Prevention: Avoid contact with hot surfaces. Shut down the dehumidifier and allow components to cool down before working on the dehumidifier. Refer to ["Shutting Down the Unit" on page 43](#).



DANGER! **The unit contains moving parts. Putting objects or body parts into the unit can result in serious injury or damage to equipment!**

The unit contains rotating parts, such as fans and a rotor. The rotor is heated by air with a temperature between 176-248 °F (80-120 °C). Putting objects into the fan or rotor will affect the proper functioning of the unit, causing damage to the object and the equipment, and will become a safety hazard for people in the vicinity of the unit.

Prevention: Avoid placing objects and body parts into the fan, and if work must be performed, ensure that the unit is properly shut down and electrical power is removed.



CAUTION!

The desiccant dryer can only be used for dehumidification of air and product drying at atmospheric pressure.

The desiccant dryer must NEVER be used without the filters. This is to protect the rotor and heaters, and maintain capacity.

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

Preventing Unsafe Operation

All personnel working with the Condair DA Series Desiccant Dryer must immediately report to the customer any alterations or changes to the unit that may affect safety, and secure the unit against accidental power-up.

If it is suspected that the unit cannot be operated safely for any of the reasons listed below, shut it down immediately. Alterations and changes that may affect safe operation include:

- damage to the unit
- loose or damaged electrical connections
- improper operation
- leaks in the distribution system

Modifications to the Unit Prohibited

Modifications are NOT permitted on the Condair DA Series Desiccant Dryer without the express written consent of Condair.

3 Product Description

3.1 General Description

The Dehumidifier consists of a solid desiccant wheel containing hygroscopic Silica Gel that absorbs moisture from process air (air to be dried), at atmospheric pressure, with an operating temperature of 41 to 104 °F (5 to 40 °C).

Examples of applications:

- Drying temperature of sensitive products
- Drying after water damage, and during construction
- Controlling humidity in production processes
- Helps protect sensitive equipment from corrosion
- Controlling humidity in museums and archives
- Improving environment in damp areas

The Condair DA series comes in seven model sizes with two different voltages. Refer to ["Technical Specification" on page 16](#) for more information.

3.2 Model Designation

The specification label on the side of the Condair DA Desiccant Dryer shows the model type, serial number, and other ratings. Refer to the [Fig. 1](#) below.



		
		DEHUMIDIFIER E505566
MODEL: XXXXXXXXXXXXXXXXXXXX		S/N: XXXXXXXXXX
VOLTS: XXXX V	PHASE: 3	HZ: 50/60
AMPS: XXXXX AMPS		
KW: XXXXXX		DATE: XXXXXXXX
MAX: xxx AMPS Circuit Protection		MADE IN CANADA

Fig. 1: Specification label

3.3 Functional Description

The Condair DA Series Desiccant Dryer operates with two air streams; a large volume air stream (process air) and a smaller volume air stream (reactivation air) that pass through a desiccant rotor in the unit. The air streams pass through the rotor in opposing directions and are driven by fans at the process air inlet and the reactivation air inlet. These air streams are separated by dividers on the surface of the rotor, and the opposing air streams are ducted separately. Refer to [Fig. 2](#) below.

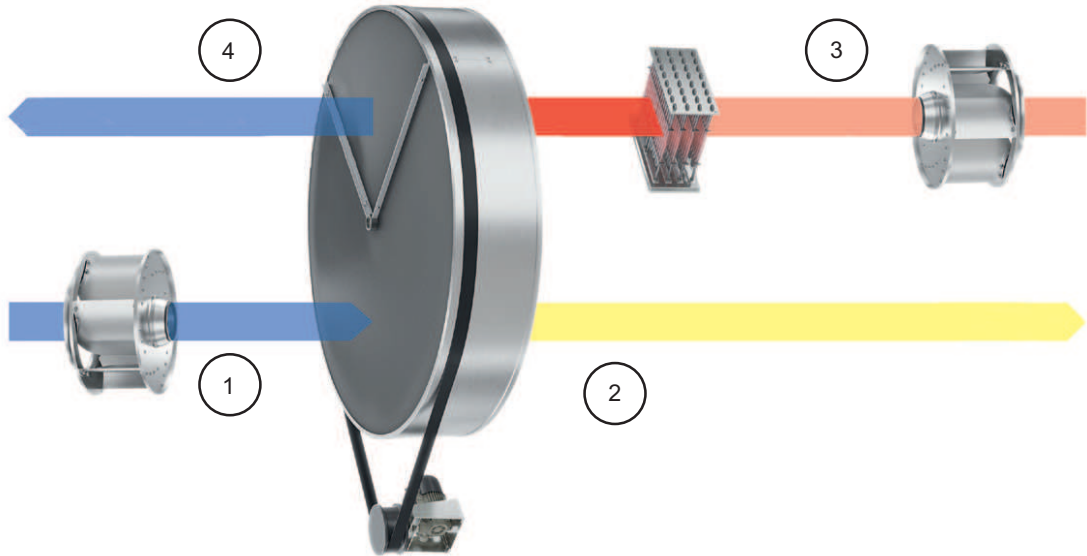


Fig. 2: Dehumidification Process

- | | |
|---------------|--------------------|
| 1 Process air | 3 Reactivation air |
| 2 Dry air | 4 Wet air |

The desiccant, embedded in a matrix on axial flutes of the rotor, contains Silica gel, a hygroscopic material, that absorbs water vapor directly from the air. As the water vapor in the process air is absorbed, the air exiting the desiccant becomes warmer and dryer, and the moisture content in the desiccant increases. The dry air leaving the rotor then enters the space that needs dehumidification.

The smaller air stream (reactivation air) is heated to +248 °F (120 °C) by an internal heater and passes through the rotor, absorbing moisture from the Silica gel, reactivating it. As such, the reactivation air has an increase in humidity. The warm, moist air is then ducted out of the building or space. The warm wet air leaving the rotor can reach +176 °F (80 °C).

Casing

The dessicant dryer is for industrial and commercial use, and can be stacked. Service to the unit can be performed by removing the access panel from the side of the unit.

The resistant double-skin housing consists of Magnelis® and RAL9006 powder coating and is insulated with 1.2 in (30 mm) thick non-combustible mineral wool.

Rotor

Dehumidification is performed by passing air over a desiccant rotor made of desiccant containing Silica Gel housed on heat-resistant sheets. These sheets are placed axially through the rotor, providing a large surface area to volume ratio for which moisture absorption may occur, and can withstand moisture-saturated air without being damaged.

The rotor rotates around a stainless steel shaft and ball bearings to provide consistent performance. A belt drive is tightly wrapped (under tension to prevent slipping) around the rim of the rotor and is driven by a pulley on a geared electric motor.

Note: The rotor will not be damaged even if the fan or the reactivation heater should fail during operation.

Note: The rotor may be used in conjunction with a pre-cooling coil.

Note: The rotor is incombustible and non-flammable, with smoke index of 0.

Rotor Seals

The rotor has two silicone/Teflon seals on the rotor casing to help protect the rotor. There are also four Teflon radial seals.

Rotor Guard

The unit is equipped with an inductive rotor guard. The rotation guard helps ensure that the rotor is rotating quickly enough. A magnet on the rotor passes by a sensor in the unit. If the magnet does not pass the sensor within 45 minutes, an alarm is activated. If the alarm is activated, the rotation guard stops the unit from dehumidifying, and deactivates the reactivation heater if the unit is restarted. If available, the rotor guard can be turned on by going to the Service level page (refer to ["Service Level Settings" on page 39](#)).

Filters

IMPORTANT! Never use the dehumidifier without the filters. Operation without a filter will result in reduced life of the unit and critical failure.

The dehumidifier has two separate panel filters; one for the process air (air to be dried) inlet, and one for the reactivation air inlet. Filters clean the air prior to entering the unit and will extend the use of the rotor.

Fans (Process and Reactivation Air)

The process air and reactivation air fans (radial) are powered by energy efficient electronically commutated (EC) motors. They are accessible for service behind the panels on the dehumidifier.

The reactivation fan in the unit will continue to operate for 6 minutes after the unit is turned off.

Reactivation Heater

The positive temperature coefficient (PTC) type reactivation heater warms air that passes from the reactivation fan to the rotor to remove moisture from the desiccant rotor. The reactivation wet air is then removed from the space.

Rotor Drive Motor

The rotor drive motor has ball bearings that drive the rotor using a drive belt and pulley system. The bearings are designed to last the life of the motor and no maintenance is required.

Electrical Panel

The electrical panel is located behind the service panel, in a separate compartment in the dehumidifier. Switches and indications are located on a touch screen on the unit.

4 Product Specifications

4.1 Technical Specification

		DA 300N	DA 400N	DA 600N	DA 800N	DA 1400N	DA 2000N	DA 2400N
Drying capacity at 68°F – 60%rh	lb/hr	7.3	11.2	15.6	22.0	29.7	31.9	44.1
Process airflow nominal	cfm	300	400	600	800	1400	2000	2400
Reactivation airflow nominal	cfm	90	130	200	235	295	325	500
Nominal external pressure process air side	in. H ₂ O	1.2	0.8	1.2	0.8	1.2	1.2	0.8
Nominal external pressure reactivation air side	in. H ₂ O	1.2	1.0	0.8	1.2	1	0.8	0.8
Admissible temperature	°F	41 - 104 (5 - 40)						
Admissible humidity	%RH	0 to 100 (non-condensing)						
Power Supply (208/3 option)	V/Ph/Hz	208/3/60						
Power consumption	kW	5.8	8.8	11.9	14.8	21.6	22.1	–
Electric power of regeneration heater	kW	4.0	7.0	10.2	13.0	17.0	18.0	–
Rated current for 208/3/60 models	A	16	24.5	33.1	41	60	61.5	–
External fuse for 208/3/60 models	A	25	35	45	60	80	80	–
Power supply (480/3 option)	V/Ph/Hz	480/3/60						
Power consumption	kW	7.9	9.6	12.9	15.6	20	23.4	31.4
Electric power of regeneration heater	kW	4.0	7.0	10.2	13.0	17.0	18.0	23.0
Rated current for 480/3/60 models	A	9.5	11.5	15.5	18.8	24.2	28.2	37.8
External fuse for 480/3/60 models	A	15	15	20	25	35	40	50
Connection diameter process air	in.	15.75						
Connection diameter dry air	in.	12.40						
Connection diameter reactivation air	in.	7.9						
Connection diameter wet air	in.	7.9						
Filter class process air		MERV 7						
Filter class reactivation air		MERV 7						
Dimension (HxWxD)	in.	38.5 x 50.6 x 39.0						
Sound Pressure level ¹⁾	Db(A)	62	62	62	63	68	69	69
Weight	lb	408	419	419	430	441	441	452

¹⁾ Maximum sound pressure level at 3.3 ft. distance, with 10 ft. applied ducting.

4.2 Control Signal

Control Signal Type	
External Control (humidistat)	0-10 VDC; at 3 V, first heating stage at 5 V, second heating stage (if applicable) Reactivation air fan speed: full speed or variable, depending on setting.
Internal Control	Humidity sensor ¹⁾ – Setpoint entered at dehumidifier control interface.

¹⁾ Humidity sensors are not included with the unit. The sensors are offered by Condair for purchase. Please contact your local Condair representative.

5 Specification Drawings

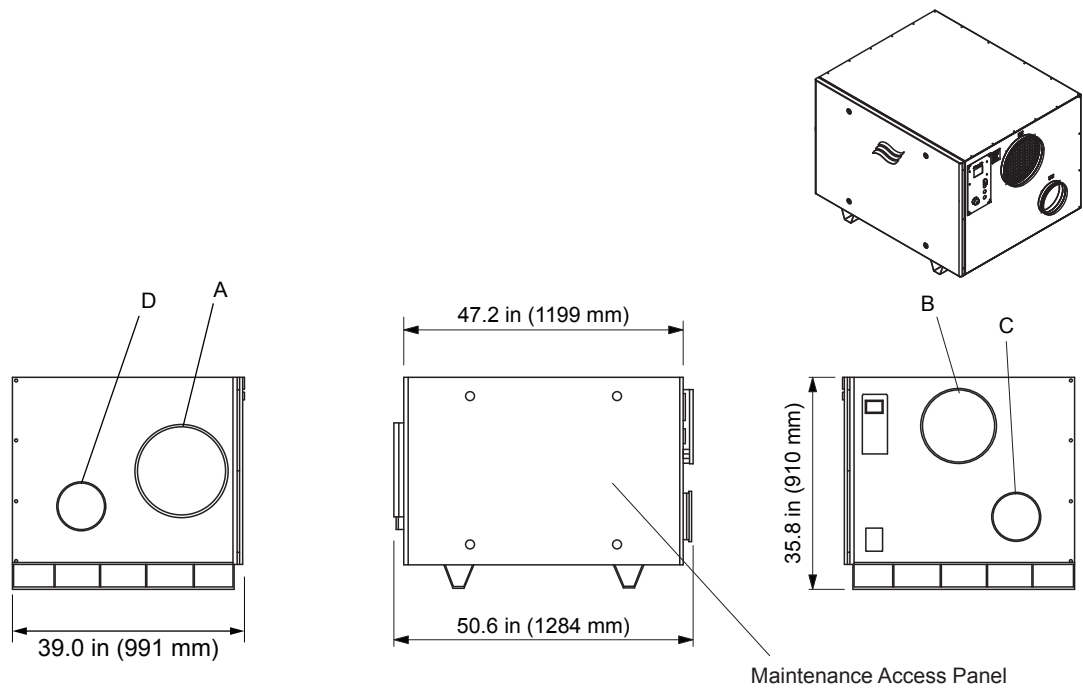


Fig. 3: Specification Drawing

- | | | |
|---|-------------------------|--------------------|
| A | Process air inlet: | Ø 15.7 in (400 mm) |
| B | Dry air outlet: | Ø 12.4 in (315 mm) |
| C | Reactivation air inlet: | Ø 7.9 in (200 mm) |
| D | Wet air outlet: | Ø 7.9 in (200 mm) |

6 Installation and Planning

6.1 General

Strictly observe and perform all installation tasks including the mounting of the unit and power supplies as described in this manual. Observe and comply with all local and national codes dealing with electrical installations. Condair does not accept any liability for installation of humidification or dehumidification equipment by unqualified personnel, or the use of equipment and parts that are not authorized by Condair.

Personnel Qualifications

All installation work must be performed only by licensed personnel authorized by the customer. It is the customer's responsibility to verify qualifications of the personnel.

Safety

Observe the following safety precautions:



DANGER!
Risk of electric shock!

The unit is mains powered. Using the On/Off button on the touch screen to shut down the unit will not remove power from the unit. Live parts may be exposed when the access panels or doors are removed. Touching live parts may cause severe injury or even death.

Prevention: Before performing any work inside the dehumidifier, shut down the dehumidifier properly, as described in ["Shutting Down the Unit" on page 43](#). The unit must be connected to the mains only after all mounting, installation, and maintenance work has been completed, checked for correct workmanship, and the access panels/doors are closed and fastened securely. Secure the unit against accidental powerup.

Only qualified personnel should perform maintenance or repairs on the unit.

Follow any lockout procedures when servicing the unit.



WARNING!
Risk of severe burns from contact with hot vapors!

The dehumidifier has an internal heater that heats the air to over 248 °F (120 °C), and can dispel wet air with temperatures over 176 °F (80 °C). Contact with hot vapors can result in severe burns.

Prevention: Never perform any work while the dehumidifier is operating. Shut down the dehumidifier and wait for the components to **cool down (at least 15 min)** before working on the system. Wear appropriate personal protective equipment when working near hot vapors. Refer to ["Shutting Down the Unit" on page 43](#) before fixing any leaks in the system.



WARNING!
Risk of severe burns from contact with hot surfaces!

The components in the dehumidifier get very hot during operation. Some components in the dehumidifier can be over 248 °F (120 °C). Contact with hot surfaces can result in severe burns.

Prevention: Avoid contact with hot surfaces. Shut down the dehumidifier and allow components to cool down before working on the dehumidifier. Refer to ["Shutting Down the Unit" on page 43](#).

**WARNING!**

The unit contains moving parts. Putting objects or body parts into the unit can result in serious injury or damage to equipment!

The unit contains rotating parts, such as fans and a rotor. The rotor is heated by air with a temperature between 176-248 °F (80-120 °C). Putting objects into the fan or rotor will affect the proper functioning of the unit, causing damage to the object and the equipment, and will become a safety hazard for people in the vicinity of the unit.

Prevention: Avoid placing objects and body parts into the fan, and if work must be performed, ensure that the unit is properly shut down and electrical power is removed.

**CAUTION!**

The desiccant dryer can only be used for dehumidification of air and product drying at atmospheric pressure.

The desiccant dryer must **NEVER** be used without the filters. This is to protect the rotor and heaters, and maintain capacity.

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

6.1.1 Installation Overview

The Condair DA Desiccant Dryer is designed for indoor installation and can be installed, with ducts, in the room to be dehumidified or in a separate room. The installation requires a duct to remove wet air from the Condair DA Desiccant Dryer, an air duct for the reactivation air, a duct for the dry air outlet (recommended, especially for distribution), and connection to the mains supply (with disconnect switch).

IMPORTANT! The reactive air supply and exhaust duct needs to be routed outside the space to be dehumidified to prevent negative pressure.

6.2 Ambient Requirements

The location of the dehumidifier is dependent on the space to be dehumidified and the distance wet and reactivation air must travel to or from the dehumidifier. It is recommended that the wet air duct and reactivation air duct be as short as possible to minimize heat losses in the ducts.

The Condair Condair DA Desiccant Dryer must be placed:

- Indoors 41 to 104 °F (5 to 40 °C).
- In a location that allows it to be inspected and serviced. Refer to ["Clearance Requirements" on page 20](#).
- Horizontally, on its legs, and bolted (recommended) to the floor.

6.3 Clearance Requirements

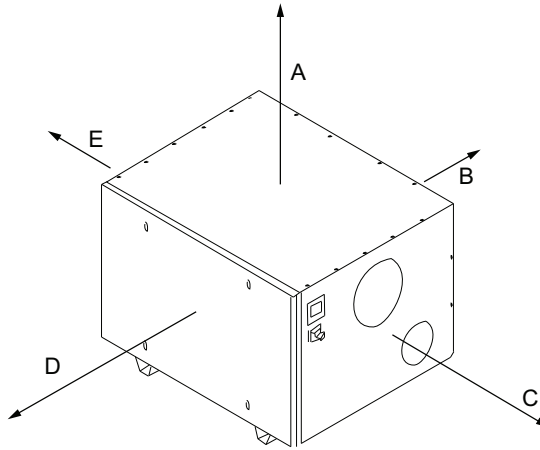


Fig. 4: Clearances

Table 1: Clearances for Condair Condair DA Desiccant Dryers (all units). Refer to [Fig. 4](#) above.

A	B	C	D	E
0 in (0 mm)	0 in (0 mm)	15.7 in (400 mm)	39.4 in (1000 mm)	0 in (0 mm)

6.4 Site Requirements

Prepare the Condair DA Series Desiccant Dryer for installation by ensuring the following site requirements are satisfied. Report any discrepancies to your Condair representative.

Ensure that the installation of the Condair DA Series Desiccant Dryer is compliant with all applicable local regulations and codes.

6.4.1 Air Supply Requirements

Filters in the dehumidifier unit help preserve the longevity of the unit and helps prevent dangerous situations. The unit uses a heater for reactivation air and a silica gel rotor, so care must be taken to reduce or prevent contaminants from entering the unit. Such contaminants may include sugar or wood "dust", or flammable vapors.

For specific situations and filters, please contact your Condair representative.

6.4.2 Power Supply Requirements

- Mains powered
- Electrical disconnect switch

6.5 Installation

The Condair DA Desiccant Dryer may be installed in the dehumidified room, or in a separate room. To obtain the best performance, equip diffuser to fan outlets.

IMPORTANT! Ensure that the rooms supplying air to the dehumidifier and rooms requiring dry air from the dehumidifier are properly vented to reduce formation of pressure imbalance. Install dampers in the process air duct to correct the dry air volume.

6.5.1 Installing the unit in the room to be dried

In this set-up, the unit is placed in the room needing dehumidification.

- Process air may come from the room itself, or from another source or location. Does not require duct if coming from the room itself. Requires a duct if coming from elsewhere.
- Dry air enters the room from the unit. Does not require duct.
- Wet air leaves the unit to another location or outside. Requires duct out of the room.
- Reactivation air may come from the room itself, or from another location. Does not require duct if coming from the room itself.

IMPORTANT! The intake and exhaust must be at least 6 ft (2 m) apart and installed in a way to prevent exhausted air from being directed into the intake. For example, use 90° hoods oriented away from each other.

6.5.2 Installing the unit in a separate room

In this set-up, the room that is housing the unit and the room needing dry air are separate.

- Process air may come from the room housing the unit, or from another source or location (including the room needing dry air). Does not require duct if coming from the room housing the unit. Requires a duct if coming from elsewhere.
- Dry air is ducted to the desired room. Requires a duct.
- Reactivation may come from the room housing the unit, or from another location (including the room needing dry air). Does not require duct if coming from the room housing the unit. Requires a duct if coming from elsewhere.
- Wet air leaves the unit to another location or outside. Requires duct out of the room housing the unit.

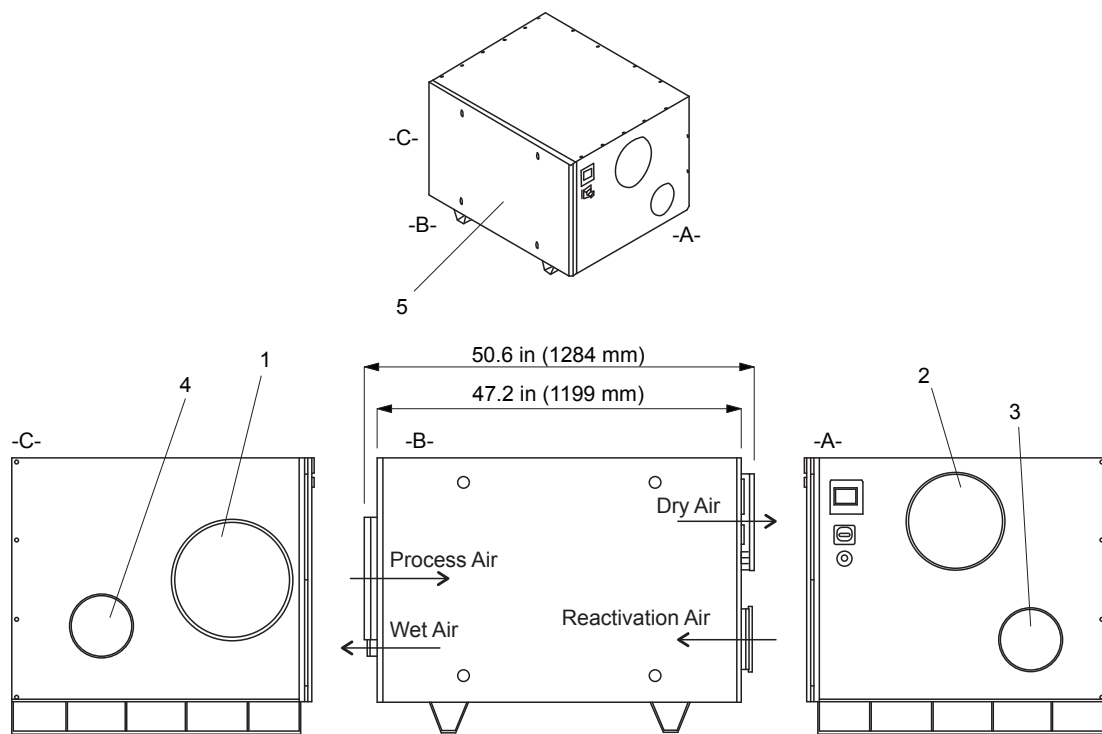


Fig. 5: Connections for the Unit

- 1 Process air connection Ø 15.7 in (400 mm), see ["Connecting the Process Air Duct Inlet" on page 24](#)
- 2 Dry air connection Ø 12.4 in (315 mm)
- 3 Reactivation air connection Ø 7.9 in (200 mm), see ["Connecting the Reactivation Air Duct Inlet" on page 25](#)
- 4 Wet air connection Ø 7.9 in (200 mm), see ["Connecting the Wet Air Duct Outlet" on page 25](#)
- 5 Service panel

6.5.3 Dampers and Air Balancing Schematic

Important: All units are delivered with process and reactivation air fans set to operate at nominal RPM and flow rate at maximum allowed inlet and outlet duct pressures. It is recommended to adjust the airflows as per the submittal approved by the engineers to ensure correct unit operation and performance.

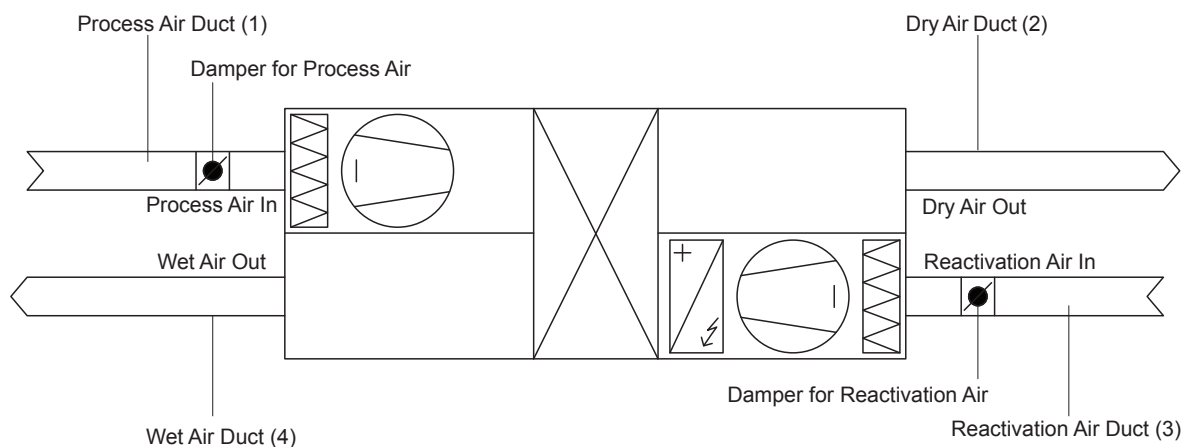


Fig. 6: Example of Damper Locations and Air Balancing setup

- 1 **Process Air:** There are two methods for achieving the require airflow:
 - a. Add a manually set damper to the process air duct, as illustrated in [Fig. 6](#). The damper must be adjusted to achieve the appropriate air volume in CFM, as measured with suitable anemometers.
 - b. The EC fan is factory wired with a link "J5" installed between terminals 4 & 5 shown in [Appendix A-3: Wiring Diagrams](#) to operate at nominal RPM and flow rates at nominal allowed combined inlet and outlet pressure (see table in [Section 4.1](#)). The link "J5" can be replaced with an external independent 0-10V signal from an external fan controller or 10-turn 500-ohm potentiometer (see ["Connection of External Controls for Process Air EC Fan" on page 29](#)). Regardless of the method used, it is crucial to calibrate the fan to ensure that the required CFM is achieved.
- 2 **Dry Air:** The ducts should be selected to have the minimum possible pressure drop (see table in [Section 4.1](#) for nominal external pressure for process and reactivation air side), also to prevent unnecessary positive pressure building up in the dry air chamber inside the unit.
- 3 **Regeneration Air:** There are two methods for adjusting the airflow:
 - a. Add a manually set damper in the regeneration air duct, as illustrated in [Fig. 6](#) above. The damper needs to be adjusted to achieve the appropriate air volume in CFM, as measured with suitable anemometers.
 - b. The EC fan is factory wired with a link "J6" installed between terminal blocks 10 & 12 shown in [Appendix A-3: Wiring Diagrams](#) to operate at nominal RPM and flow rates at nominal allowed combined inlet and outlet pressure (see table in [Section 4.1](#)). The link "J6" can be replaced with an external independent 0-10V signal from an external fan controller or 10-turn 500-ohm potentiometer (see ["Connection of External Controls for Regeneration Air EC Fan" on page 30](#)). Regardless of the method used, it is crucial to calibrate the fan to ensure that the required CFM is achieved.
- 4 **Wet Air:** The wet air duct should be insulated and the ducts should be selected to have the minimum possible pressure drop at nominal allowed combined inlet and outlet pressure (see table in [Section 4.1](#)). In this duct, there is a risk of condensation. To prevent a collection of condensate, this duct should slop down in angle of at least $>2^\circ$ or have a condensate drain on its lowest point (p-trap with condensate well). If the unit is equipped with full modulating capacity, there is an increased risk of condensate. In this case, we recommend using corrosion resistant ducts.

6.5.4 Safety

Observe all safety precautions and comply with local installation codes. Refer to ["For your Safety" on page 9](#).

6.5.5 Mounting the Dehumidifier

Refer to ["Mounting Requirements"](#) for mounting requirements.

The Condair DA Desiccant Dryer comes equipped with legs and is intended to be mounted indoors and on the floor. It is recommended to bolt the legs down to the floor.

Mounting considerations:

- Ensure that there is enough clearance around the unit for ducting and servicing. Refer to ["Clearance Requirements" on page 20](#).
- Ensure that the unit is horizontal and on a level surface.
- Ensure that the unit is secured (ex. bolted).

6.5.6 Connecting the Process Air Duct Inlet

Typical installations of the Condair DA Desiccant Dryer do not require a process air duct to the unit because the unit is installed in the space needing dehumidification. Instead, air into the dehumidifier is taken from the space directly.

Diameter of the Process Air Connection: 15.7 in (400 mm)

Considerations for the Process Air Connection:

- Units installed in the dehumidified room should be installed with a protection net for the process air inlet.
- Use rivets or mounting screws to ensure that the duct connection is secure.
- For units installed in a separate room, use a duct to supply the unit with process air. Follow local guidelines.

Note: A damper may be installed in the process air duct to allow the correct commissioning of the dry air volume.

6.5.7 Connecting the Reactivation Air Duct Inlet

Reactivation air enters the dehumidifier and passes through a heater. The air is heated and then passes through a section of the rotor, where moisture from the Silica Gel is released into the air stream and removed from the system. Because of the moisture content of the exiting reactivation air, condensation may form and should be removed. Refer to ["Connecting the Wet Air Duct Outlet" on page 25](#).

Typical set-ups, where the Condair DA Desiccant Dryer is installed in the dehumidified room, do not require a duct connection for the reactivation air. In these installations, the air is taken from the space. A coarse wire net is recommended to filter out debris and other small objects from entering the unit.

Diameter of the Reactivation Air connection: 7.9 in (200 mm)

Considerations for the reactivation air duct:

- Ensure that the duct feeding the unit is as short as possible.
- Use rivets or mounting screws to ensure that the duct connection is secure.
- Ensure that a filter (coarse wire net) is used at the inlet to prevent foreign objects from entering the dehumidifier and internal heater.
- The duct may be sloped upwards. Prevent objects from falling into the duct.
- Install a condensate drain at the exit.

6.5.8 Connecting the Wet Air Duct Outlet

Wet air leaving the Condair DA Desiccant Dryer comes from the reactivation air that has passed through the internal heater and desiccant rotor.

IMPORTANT! The reactivation air leaving the desiccant rotor is hot and can reach temperatures of over 176 °F (80 °C).

Diameter of Wet Air Connection: 7.9 in (200 mm)

Considerations for the wet air duct:

- Wet air from the desiccant dryer should be exhausted to the outside.
- A coarse wire net should be installed at the exhaust opening to prevent entry from animals and large debris.
- The duct should be as short as possible.
- Condensate could form in the duct; slope the duct downwards to prevent condensate from returning to the dehumidifier. The downward slope should have an angle of 2° or more.
- Prevent standing water. Condensate could form in the duct if it is long, or slopes upwards. A drainage hole ~0.15-0.25 in (4-6mm) may be drilled at the duct's lowest position. Alternatively, a drain line may be installed in the duct. Contact your Condair representative for information on proper draining.
- Place warning signs at the outlet, or where applicable. The wet air temperature may reach above 176 °F (80 °C).
- Use rivets or mounting screws to secure the duct connection to the unit.
- Insulate the wet air duct system.

6.5.9 Installing the Electrical Connections

Refer to ["Model Designation" on page 13](#) and ["Power Supply Requirements" on page 20](#) for the electrical requirements. All wiring must be in accordance with local electrical codes.

Safety

The electrical installation work requires removal of the door panels in the humidifier. Observe the following safety precautions:



DANGER!
Risk of electric shock!

The unit is mains powered. Using the On/Off button on the touch screen to shut down the unit will not remove power from the unit. Live parts may be exposed when the access panels or doors are removed. Touching live parts may cause severe injury or even death.

Prevention: Before performing any work inside the dehumidifier, shut down the dehumidifier properly, as described in ["Shutting Down the Unit" on page 43](#). The unit must be connected to the mains only after all mounting, installation, and maintenance work has been completed, checked for correct workmanship, and the access panels/doors are closed and fastened securely. Secure the unit against accidental power-up.

Only qualified personnel should perform maintenance or repairs on the unit.

Follow any lockout procedures when servicing the unit.

- All electrical installation work must be performed only by a licensed electrician authorized by the customer. It is the customer's responsibility to verify qualifications of the personnel.
- The electrical installation must be performed according to the wiring diagrams in this manual, the instructions in this section, as well as applicable national and local codes.
- All cables must lead into the unit, via appropriate cable glands or grommets, and be properly supported.
- Make sure the cables are secured, and do not rub on any components or become a tripping hazard.
- Observe national and local codes for maximum cable length and required wire sizes for cables.

Ensure that the external isolation/disconnect switch is open and the unit is disconnected from mains, and the unit is switched to the Off position before proceeding.

Refer to the ["Appendix A-3: Wiring Diagrams" on page 60](#).

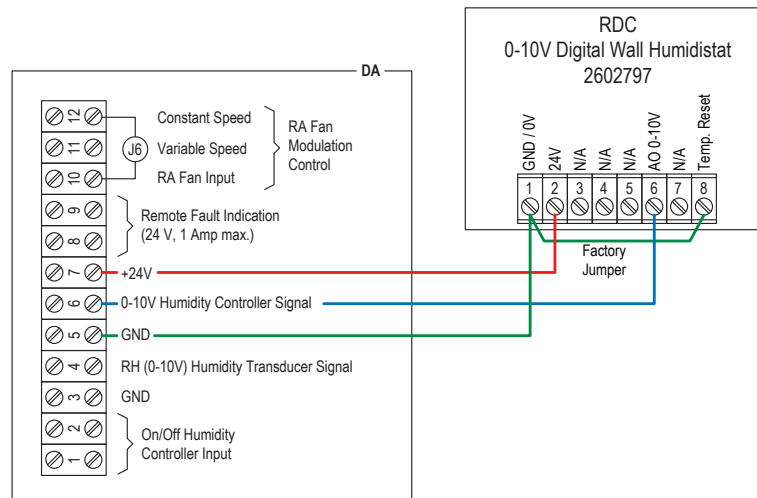
Once the unit is connected to the main power supply, check that all three phases, at terminals L1, L2, and L3, are live, and the unit is on standby (the standby light on the touch screen is lit and the machine is not dehumidifying).

6.5.9.1 Electrical Connections Checklist

- ☐ Power supply meet the voltage and current requirements shown on the specification label? Refer to ["Model Designation" on page 13](#).
- ☐ All cables fastened securely?
- ☐ All electrical connections meet applicable codes?
- ☐ Electrical installation meet the applicable national and local codes?

6.5.10 Installation Work External Controls Connections

Connecting a demand signal



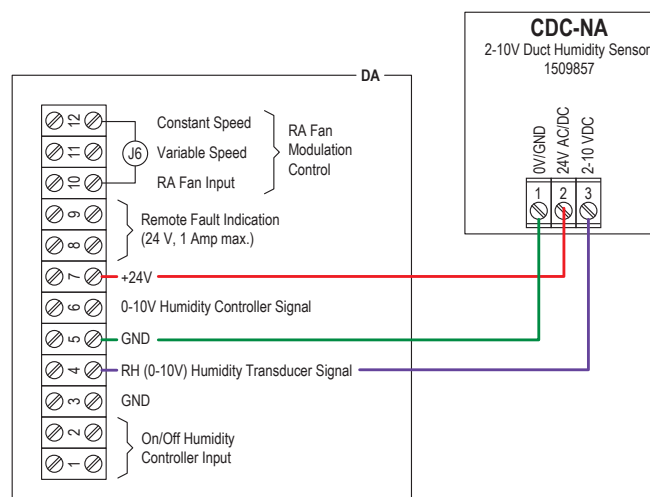
The signal cable of an external controller demand signal (if the internal P/PI controller is used) is to be connected according to the wiring diagram to terminal "5" (GND), "7" (+24V) and "6" (0-10V Humidity Controller Signal) of the dehumidifier terminal block inside the control panel compartment.

The connecting cable must be led through a cable gland into the control panel compartment.

Note: For modulating control do not connect any wires to terminal 1 & 2 of the dehumidifier.

Note: This configuration package is offered by Condaire (P/N 2602797) factory programmed for dehumidification. Please contact your local Condaire representative.

Connecting a humidity sensor



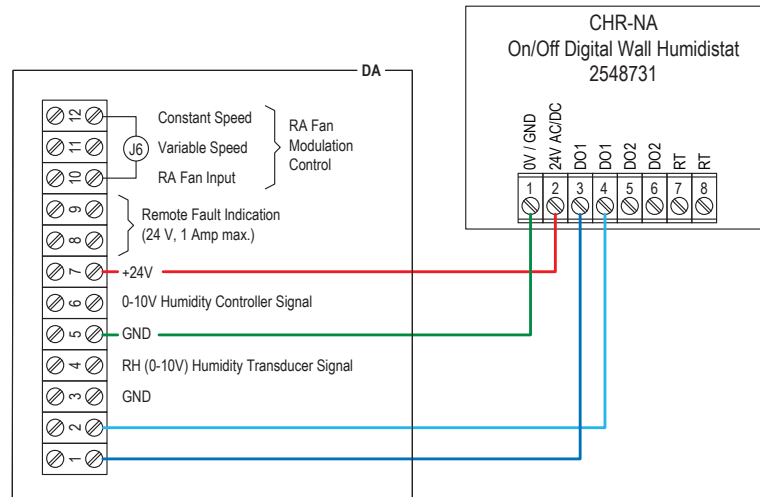
The signal cable of a humidity sensor is to be connected according to the wiring diagram to terminal "5" (GND), "7" (+24V) and "4" (Humidity Transducer Signal RH(0-10V)) of the dehumidifier terminal block inside the control panel compartment.

The connecting cable be led through a cable gland into the control panel compartment.

Note: For modulating control do not connect any wires to terminal 1 & 2 of the dehumidifier.

Note: This configuration package is offered by Condaire (P/N 2597926). This package will require programming for dehumidification. Please contact your local Condaire representative.

Connecting 24V On/Off humidistat

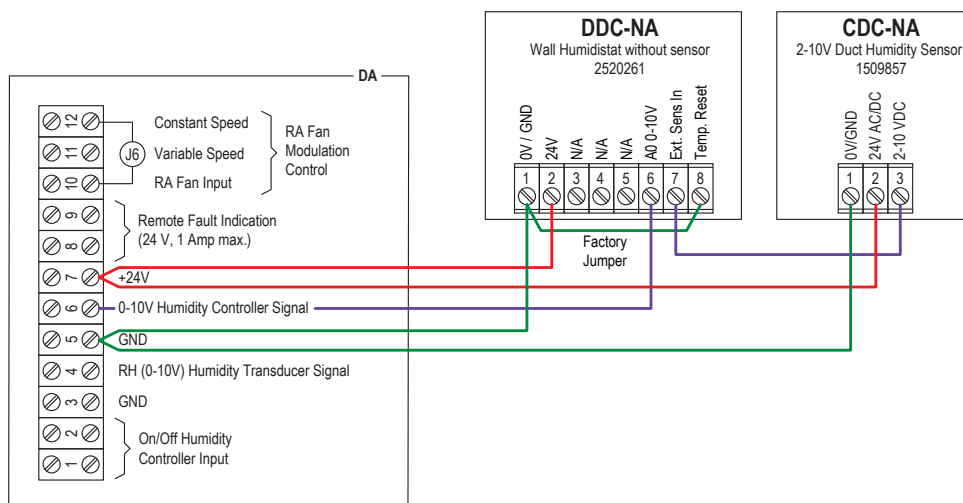


The signal cable of 24V On/Off humidistat is to be connected according to the wiring diagram to the terminals "1" and "2" (On/Off Humidity Controller Input), "5" (GND) and "7" (+24V) of the control terminal block inside the control panel compartment.

The connecting cable must be led through a cable gland into the control panel compartment.

Note: This configuration package is offered by Condair (P/N 2597934). Please contact your local Condair representative.

Connecting 0-10V humidistat with remote duct sensor



The signal cable of an external controller or of a humidity sensor (if the internal P/PI controller is used) are to be connected according to the wiring diagram to terminal "5" (GND), "6" (0-10V Humidity Controller Signal) of the control terminal block inside the control panel compartment.

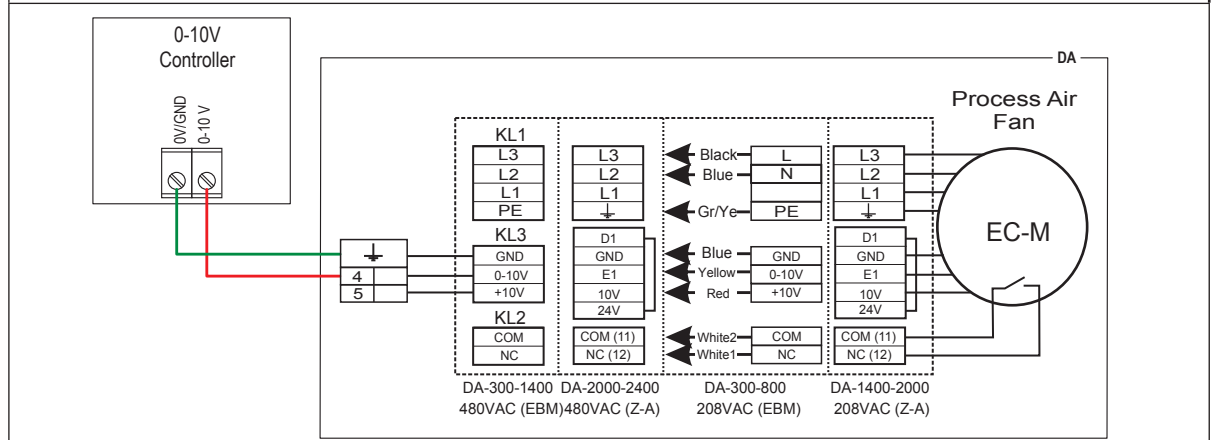
The connecting cable must be led through a cable gland into the control panel compartment.

Note: This configuration package is offered by Condair (P/N: 2602796). Please contact your local Condair representative."

6.5.11 Connection of External Controls for Process Air EC Fan

Note: Only adjust the speed of the fan to achieve the nominal CFM. The dehumidification output should be controlled by the humidistat connected to the control terminal.

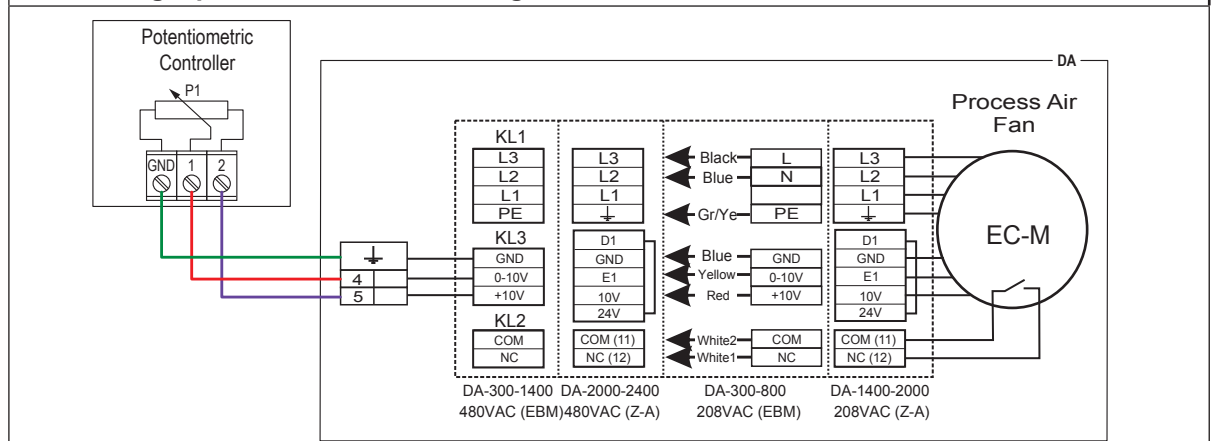
Connecting a 0-10V control signal



The signal cable of an external 0-10V controller is to be connected according to the wiring diagram to terminal "4" and "GND" of the process air fan terminal block inside the control panel compartment.
Important: Factory installed link "J5" between terminals "4" and "5" must be removed.

The connecting cable must be led through a cable gland into the control panel compartment.

Connecting a potentiometric control signal



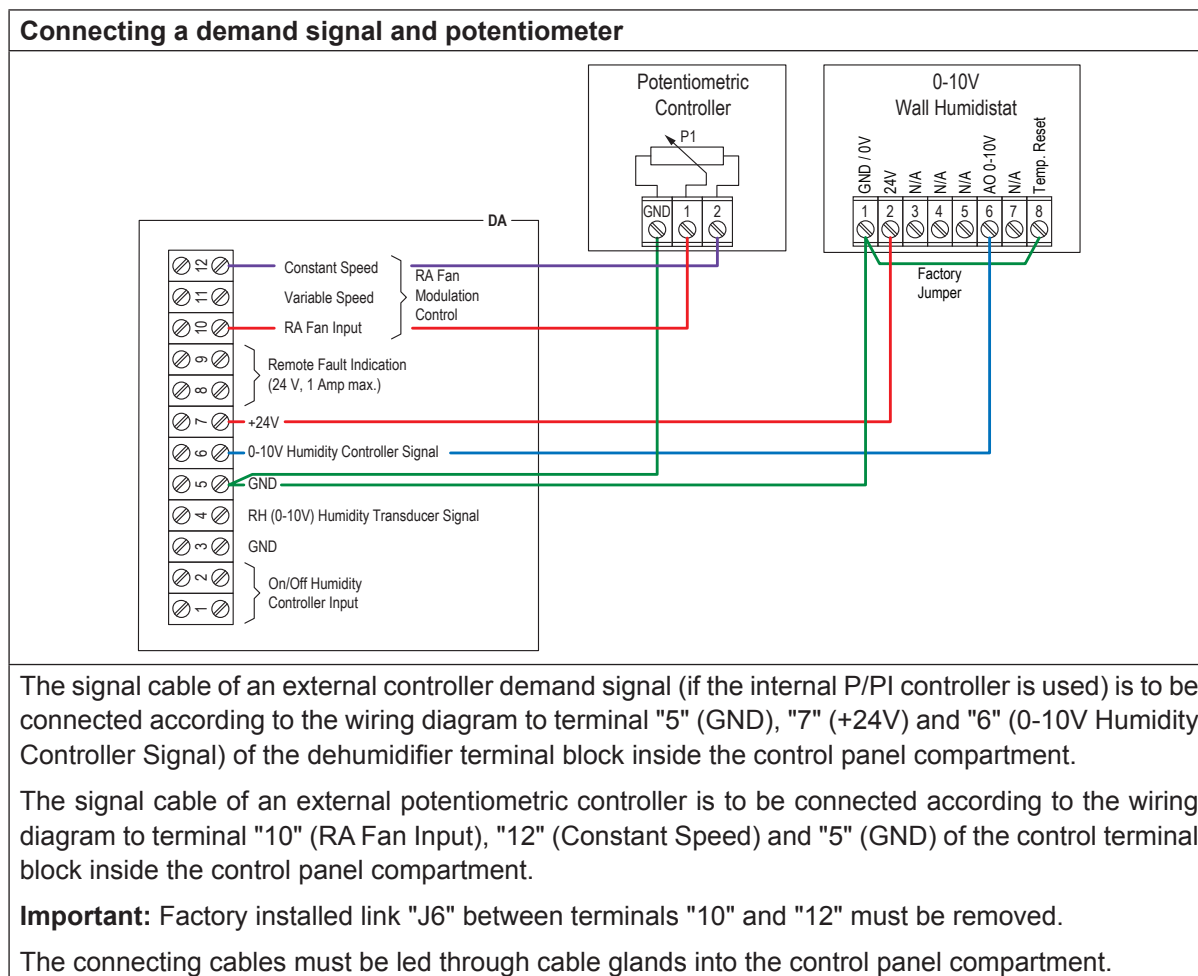
The signal cable of an external potentiometric controller is to be connected according to the wiring diagram to terminal "4", "5" and "GND" of the process air fan terminal block inside the control panel compartment.

Important: Factory installed link "J5" between terminals "4" and "5" must be removed.

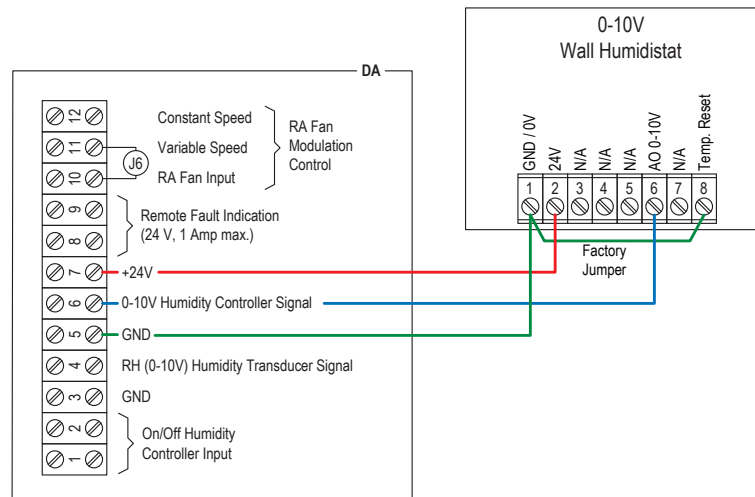
The connecting cable must be led through a cable gland into the control panel compartment.

6.5.12 Connection of External Controls for Regeneration Air EC Fan

Note: In the below setup potentiometer should only be used to achieve the nominal airflow.



Modulating the reactivation air fan based on the demand signal (true modulation)



The signal cable of an external controller demand signal (if the internal P/PI controller is used) is to be connected according to the wiring diagram to terminal "5" (GND), "7" (+24V) and "6" (0-10V Humidity Controller Signal) of the dehumidifier terminal block inside the control panel compartment.

Factory installed link "J6" between terminals "10" and "12" must be removed and connected between terminal "11" and "10".

The connecting cable must be led through the cable glands into the control panel compartment.

7 User Interface

7.1 Control Software

The programmable logic controller (PLC) in the Condair DA Desiccant Dryer features a touchscreen, LCD display, that allows you to control the dehumidifier, runtime meters, and alarms. The controller also features functions to protect the rotor from excess rotation, functions to safely cool the internal heater, and functions that control dehumidity through an external 0-10 V humidity sensor or control signal.

7.1.1 Navigation Elements

The graphic interface comprises of several pages that allow you control the unit or navigate to other pages in the software.

To activate the touch screen, simply tap on the display. This will reveal the Main page. From there, you may access the Operation, I/O's, or Menu page. The general structure of the software is shown in [Fig. 7](#) below.

The display will automatically turn off after 15 minutes. Touch the screen to turn the display on.

Note: The display remains on while an alarm is active.

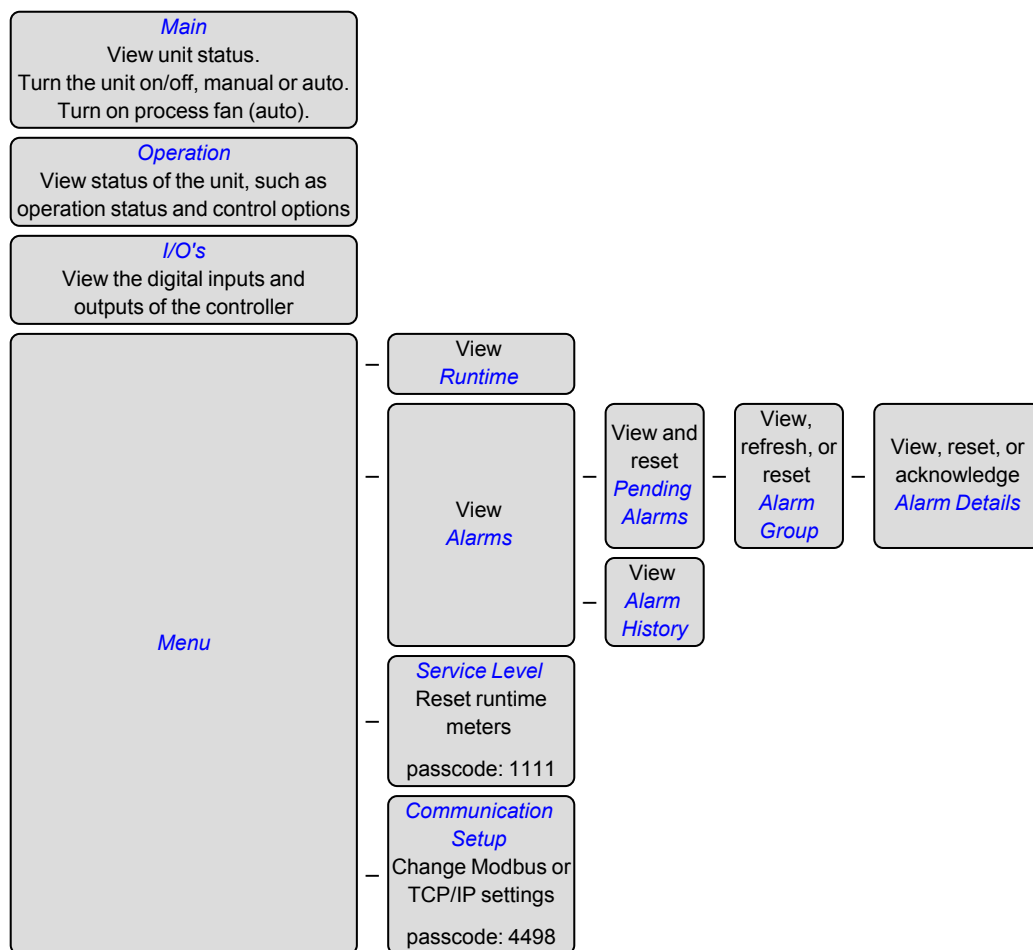


Fig. 7: GUI Layout

7.1.2 Main Page

The Main page shows the unit status and three buttons that allow you to turn the unit on/off, set the unit to manual or automatic mode, and set the process fan to run continuously.

There are three status lights on the Main page:

- **Operation** - turns green when the unit is turned on and the unit is dehumidifying.
- **Stand by** - turns orange while the unit is on, AND the unit is NOT dehumidifying.
- **Alarm** - turns red or yellow while an alarm is active. This light will remain on until the alarm(s) is acknowledged and reset. Refer to ["Reset Alarms" on page 45](#).



Unit On/Off

Turn the unit ON or OFF.

Manual/Auto

MANUAL: Run the unit continuously.

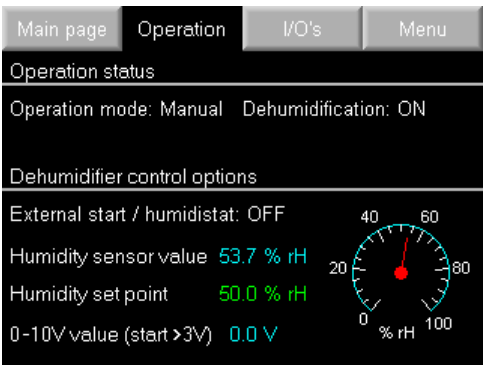
AUTO: Unit is run with a humidity control signal, or an external on/off signal.

Cont. P. A. Fan

Run the process air fan continuously. Allows the air to circulate, even if no dehumidification is required.

7.1.3 Operation Page

The Operation page shows the operational status of the unit and the available control options.



Operation Status

Operation mode shows the unit in AUTO or MANUAL mode. If dehumidification is ON, the unit is operational. If OFF, the unit is in Stand by.

This information can also be seen on the Main page.

Dehumidifier Control Options

If a humidity sensor is connected, the unit starts when the sensed humidity is greater than the setpoint humidity (default setpoint: 50%).

If there is no sensor, the humidity sensor value will read 0%. If a 0-10 V signal is used to control the humidity, the first heating stage occurs when the control signal exceeds 3 V. At 5 V, the second heating is activated (if applicable). The reactivation fan runs at full speed.

7.1.4 I/O Input Outputs Page

The I/O's page shows the current digital inputs and outputs in the controller.

The inputs and outputs are indicated with 1's and 0's.

- 1 = On (or Auto)
- 0 = Off

Note: These inputs/outputs differ based on the unit size and version.

Main page	Operation	I/O's	Menu
Digital inputs		Digital outputs	
0 Rotation guard		1 React. heater step 1	
0 React. heater fuse		1 React. heater step 2	
0 Process air fan fuse		1 Process air fan	
0 Re. air fan/Drive motor fuse		1 React. air fan	
0 OH2 Overheat protect.		1 Rotor drive motor	
0 P.a. fan thermal		0 Ext. alarm indication	
0 Filter guard			
0 Ext. start/humidistat			
0 Ext. emergency stop			
0 React. air fan thermal			

Digital Inputs

Rotation guard
Reactivation heater fuse
Process air fan fuse
Reactivation air fan/Drive motor fuse
OH2 Overheat protection
Process air fan thermal
Filter guard
External start/humidistat
External emergency stop
Reactivation air fan thermal

Digital Outputs

Reactivation heater step 1
Reactivation heater step 2
Process air fan
Reactivation air fan
Rotor drive motor
External alarm indication

7.1.5 Menu Page

The Menu page shows the unit's component runtime, alarms, software version, time and date. Accessing the Service level screen and the Communication Setup screen allows you to reset the service timer and set up how the unit communicates

Main page	Operation	I/O's	Menu
		Runtime	
		Alarms	
Service level		Communication setup	
Password (4 digit)		Password (4 digit)	
PLC-35 Condair ver. 19.01.15		16:57:41	18/01/19

Runtime - view how long components in the unit have been on. See ["Runtime" on page 35](#).

Alarms - view alarm history and details, acknowledge, and reset acknowledged alarms. See ["Alarms" on page 36](#).
Service Level - (requires password) reset runtime meters. See ["Service Level Settings" on page 39](#).

Communication Setup - (requires password) communicate via Modbus, TCP/IP, or remotely. See ["Communication Settings" on page 40](#).

7.1.5.1 Runtime

The Runtime page shows the active time of components in the Condair DA Desiccant Dryer, as well as the total dehumidifier runtime, and hours since maintenance.

Main page	Operation	Runtime	Menu
Runtime in hours			
Dehumidifier runtime		1	
Process air fan runtime		1	
React. air fan runtime		1	
Drive motor runtime		1	
Since process filter change		1	OK
Since react. filter change		1	OK
Since new rotor seals		1	OK

Here, you can find the runtime (in hours) for the:

- Dehumidifier
- Process air fan
- Reactivation air fan
- Drive motor

You can also find out the time (in hours) since maintenance of the following components:

- Process air filter
- Reactivation air filter
- Rotor seals

Note: The runtime meters for maintenance (bottom three) can be reset from the Service Level page. Refer to ["Service Level Settings" on page 39](#).

7.1.5.2 Alarms

Alarms alert you to any complications with the operation of the unit. While an alarm is active, the alarm status light on the Main page will display a red or yellow light, depending the urgency. Urgent alarms are shown with red, and non-urgent alarms are shown with yellow.

Issues causing urgent alarms may cause damage to the unit, so the dehumidifier ceases operation. Non-urgent alarms do not cease operation of the unit.

The button <Pending alarms> opens a page showing all the alarms that are pending. The button <Alarm history> opens a page showing the alarm history.

If an urgent alarm occurs, the unit will stop running. The unit can be restarted, but without the functions connected to the cause of the alarm. The alarm will remain active until the cause of the alarm has been taken care of. A non-urgent alarm will not stop the unit.

To remove the alarm, once the issue is resolved; the alarm must be acknowledged under the Pending alarm submenu. Then turn off and restart the unit.

Main page	Operation	Alarms	Menu
URGENT ALARM		NON URGENT ALARM	
React. heater fuse		Check proc. air filter	
Process air fan fuse		Check react. air filter	
React. air fan/Drive motor fuse		Check rotor seal	
OH2 Overheat protect.		React. air fan thermal	
Rotor guard		Filter guard	
Proc. air fan thermal			
Pending alarms		Alarm history	

The Alarms page shows Urgent or Non-Urgent alarms (see ["Pending Alarms" on page 37](#), and ["Alarm History" on page 38](#)).

Urgent alarms indicate an issue with components critical to proper functioning of the unit.

These items include:

- Reactivation air heater
- Process air fan / dry air fan
- Reactivation air fan / wet air fan
- Drive motor
- Process air fan thermal protection
- Reactivation air fan thermal protection (when available)
- High temperature limit (when available)
- OH2 Overheat protection

Non-urgent alarms indicate possible issues that may affect the performance of the unit.

These components include:

- Process air filters
- Reactivation air filters
- Rotor seals
- Reactivation air temperature thermostat (stops the reactivation heaters when active)
- Filter guard

Pending Alarms

Access your list of all pending alarms by tapping on the Pending Alarms button on the Alarms page.



On this page, you can see the number of active issues of urgent and non-urgent alarms.

- *Details* button (🔍) - See the alarms in the group. Press the button again to see the specific alarm's details.
- *ESC* - Return to the previous page.
- *Reset* - Resets all inactive alarms in the group.
- *Refresh* - Reloads the page.

Alarms in Group and Alarm Details

You can view the alarms in either urgent or non-urgent groups. The Alarms in Group page shows a brief overview of the alarms in the group.

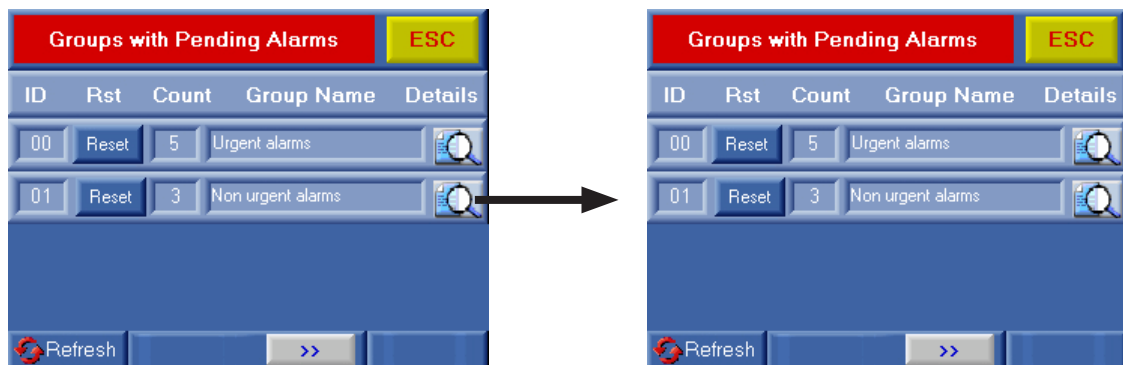
This information includes the alarm's:

- *ID* - Identification number
- *Time On* - When the alarm was triggered
- *Ack* - Acknowledged: (Y)es or (N)o
- *Alarm Name* - Name of the alarm

Pressing the *Details* button (🔍) next to an alarm brings you to the Alarm Details page, where you press *Ack* to acknowledge the alarm.

Pressing *Reset* will reset the alarm, only if the cause for the alarm is NOT active.

IMPORTANT! Reset an alarm after it has been acknowledged.



Alarm History

Alarm history shows information about old alarms. It shows the time the alarm occurred and was resolved, the time elapsed before acknowledgment and when it was reset. Use the left and right arrows on the touchscreen to go between alarm entries.

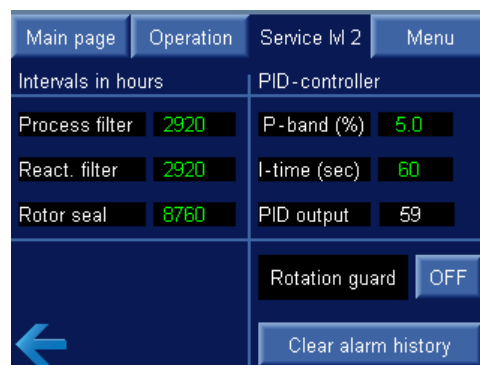
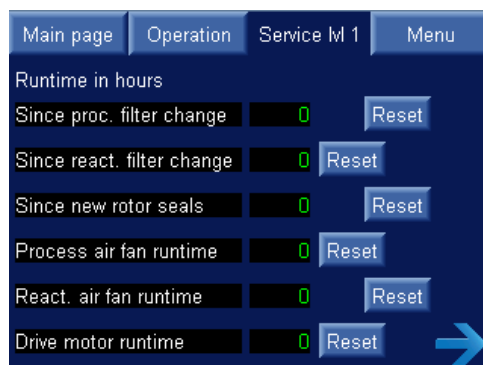
Priority	Low	Alarm History	ESC
Group	00	Urgent alarms	
ID	004	Fault drive motor	
Trigger Rise Time	30/01/06 02:45	Duration	
Trigger Fall Time	30/01/06 02:50		00:05:00
Ack. Time	30/01/06 03:39		00:52:18
Reset Time	00/00/00 00:00		
		<<	>>

To clear the alarm history, go to the second service level page (see ["Service Level Settings" on page 39](#), requires password) and press *Clear alarm history*.

7.1.5.3 Service Level Settings

Password: 1111

There are two service level pages. The second service level page is accessed by pressing the arrow button (➡) at the bottom of the screen.



The first service level page shows the runtime meters and runtime reset buttons for the following components (in hours):

- Time since process air filter was changed.
- Time since reactivation air filter was changed.
- Time since rotor seals were replaced.
- Process air fan runtime.
- Reactivation air fan runtime.
- Drive motor runtime.

The second service level page shows the adjustable interval period for the process air filter, reactivation air filter, and the rotor seal, before an alarm is activated.

If you are using a humidity sensor, the page also shows the PID controller settings:

- *P-band* - range above and below the humidity setpoint.
- *I-time* - controls the speed of the controller.
- *PID output* - displays the dehumidification demand between 0-100 (stop = 0, start = 30).

IMPORTANT! The PID settings should not be changed. Consult your Condair representative.

In addition to this, the second service level page shows buttons that will allow you to clear the alarm history (refer to ["Reset Alarms" on page 45](#)), and turn on/off the rotor rotation guard (if available).

7.1.5.4 Communication Settings

Password: 4498

The Communication Settings page displays settings for Modbus TCP/IP and RS485 connections, as long as a communication card is installed.

Note: The Modbus data points are located here: ["Appendix A-4: Communication" on page 64](#).

The screenshot shows a web interface with a dark blue background and light blue buttons. At the top, there are four tabs: 'Main page', 'Operation', 'Setup level', and 'Menu'. Below the tabs, there are two main sections. The first section is titled 'RS485 settings if such a card is installed.' and contains a 'Modbus Network ID' field with the value '35' displayed in green. Below this, there is a prompt 'RS485 settings (select only one & press save).' followed by six buttons: '9600,8,N,1', '19200,8,N,1', '57600,8,N,1', '9600,8,E,1', '19200,8,E,1', and '57600,8,E,1'. To the right of these buttons is a 'SAVE RS485' button. The second section is titled 'Modbus TCP/IP settings' and contains three rows of settings: 'IP Address:' with values '192', '168', '0', '150'; 'Gateway:' with values '192', '168', '0', '1'; and 'Subnet:' with values '255', '255', '255', '0'. To the right of these rows is a 'Save TCP/IP' button.

Modbus Network ID

Default: 35

RS 485

Choose between six different combinations, then save.

Modbus TCP/IP

Enter the IP Address, Gateway, and Subnet, then save.

8 Operation

8.1 General

Personnel Qualifications

The Condair DA Series Desiccant Dryer must only be operated by personnel who are adequately qualified, competent, and are authorized by the customer.

Safety

Observe the following safety precautions.



DANGER!
Risk of electric shock!

The unit is mains powered. Using the On/Off button on the touch screen to shut down the unit will not remove power from the unit. Live parts may be exposed when the access panels or doors are removed. Touching live parts may cause severe injury or even death.

Prevention: Before performing any work inside the dehumidifier, shut down the dehumidifier properly, as described in ["Shutting Down the Unit" on page 43](#). The unit must be connected to the mains only after all mounting, installation, and maintenance work has been completed, checked for correct workmanship, and the access panels/doors are closed and fastened securely. Secure the unit against accidental powerup.

Only qualified personnel should perform maintenance or repairs on the unit.

Follow any lockout procedures when servicing the unit.



WARNING!
Risk of severe burns from contact with hot vapors!

The dehumidifier has an internal heater that heats the air to over 248 °F (120 °C), and can dispel wet air with temperatures over 176 °F (80 °C). Contact with hot vapors can result in severe burns.

Prevention: Never perform any work while the dehumidifier is operating. Shut down the dehumidifier and wait for the components to cool down (at least 15 min) before working on the system. Wear appropriate personal protective equipment when working near hot vapors. Refer to ["Shutting Down the Unit" on page 43](#) before fixing any leaks in the system.



WARNING!
Risk of severe burns from contact with hot surfaces!

The components in the dehumidifier get very hot during operation. Some components in the dehumidifier can be over 248 °F (120 °C). Contact with hot surfaces can result in severe burns.

Prevention: Avoid contact with hot surfaces. Shut down the dehumidifier and allow components to cool down before working on the dehumidifier. Refer to ["Shutting Down the Unit" on page 43](#).

**DANGER!**

The unit contains moving parts. Putting objects or body parts into the unit can result in serious injury or damage to equipment!

The unit contains rotating parts, such as fans and a rotor. The rotor is heated by air with a temperature between 176-248 °F (80-120 °C). Putting objects into the fan or rotor will affect the proper functioning of the unit, causing damage to the object and the equipment, and will become a safety hazard for people in the vicinity of the unit.

Prevention: Avoid placing objects and body parts into the fan, and if work must be performed, ensure that the unit is properly shut down and electrical power is removed.

**CAUTION!**

The desiccant dryer can only be used for dehumidification of air and product drying at atmospheric pressure.

The desiccant dryer must **NEVER** be used without the filters. This is to protect the rotor and heaters, and maintain capacity.

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

8.2 Starting Up

Ensure that the proper commissioning has been performed, and the Condair DA Desiccant Dryer is connected to the mains power supply. Refer to ["First-time Commissioning" on page 55](#).

To start the Condair DA Desiccant Dryer:

1. Tap on the touchscreen to see the main page. The unit should be on Standby.
2. Under Unit On/Off, tap the switch button to ON.
3. Determine if the dehumidifier should run off of a signal, or run continuously.
 - Tap the Manual/Auto switch button to *MAN* or *AUTO*.
 - » *MAN* - (manual) run the dehumidifier continuously.
 - » *AUTO* - (automatic) run the dehumidifier on a control or on/off signal.
4. Determine if the process fan should run continuously (in automatic mode).
 - Tap the Cont. P. A. Fan (Continuous Process Air Fan) switch button to *OFF* or *ON*.
 - » *ON* - the process fan will run continuously while the unit is in Automatic mode.
 - » *OFF* - the process fan energizes only when dehumidification is needed.

8.3 Shutting Down the Unit

IMPORTANT! The Condair DA is mains powered. Disconnect the dehumidifier from the mains power supply before opening any service panels. Ensure that the external disconnect switch has removed the unit from the mains power supply.

To shut down the Condair DA Desiccant Dryer:

1. Touch the LCD screen to display the Main Page of the dehumidifier. On the touch screen, tap the Unit On/Off button to turn the unit OFF.

Note: If the unit has been running, the reactivation air fan will continue to run for 6 minutes to purge excess heat.

8.4 Configuring the Control Software

Insert communication modbus table and forward to instructions for write-able settings:

- Analog Setpoint - humidity setpt for hum sensor
- On/Off (see shutting down/starting)
- Turn on cooling fan
- Set unit to automatic or manual
- Allow process fan to run continuously

8.5 Resetting Alarms

Refer to ["Reset Alarms" on page 45](#).

9 Maintenance

9.1 General

Strictly observe all safety precautions, and perform only those maintenance tasks described in this manual. Refer to ["For your Safety" on page 9](#).

Use only original Condair replacement parts.

All maintenance work must be performed only by licensed personnel authorized by the customer. It is the customer's responsibility to verify qualifications of the personnel.

The maintenance work may require removal of the cover on the unit.

9.2 Maintenance List

The maintenance intervals for the dehumidifier depend on the environment. As such, the maintenance frequency will differ between units, so regular inspections should be performed until a suitable maintenance interval is created. Incorrect service and maintenance may reduce the efficiency of the unit.

Perform the following maintenance tasks at the (suggested) intervals specified in ["Maintenance List" on page 44](#) on the next page. For the components referenced in the table, refer to ["Condair DA Spare Parts List" on page 49](#).

Table 2: Maintenance List

Task/Component	Frequency	Description
Filters	Monthly, or as needed	<p>Check the filters for debris and dust, and replace them as necessary. Blockages in the filter may result in pressure drops across the filter. Clogged filters will lead to failure of the heater and desiccant rotor.</p> <p>A service reminder alarm will activate after a set time to check the filters regularly.</p> <p>NEVER operate the unit without the filters. Dust can damage the desiccant rotor and heater, and reduce the efficiency of the unit.</p>
Rotor (and bearings)	Annually	<p>Inspect the rotor for damage, dust, or any other debris. Use compressed air to clean the rotor.</p> <p>Direct the compressed air in the opposite direction of process air flow to prevent particles from embedding further into the desiccant rotor.</p> <p>For severe levels of debris and dust, consult your Condair representative, then (optional) use water to wash the rotor.</p> <p>The rotor bearings and rotor surface should also be inspected for any damages. Contact Condair for a replacement if necessary.</p>
Rotor Drive Belt	Bi-annually	<p>Check the tension of the drive belt and readjust the tension as needed. The unit comes with an internal belt tension device so readjustment of the belt is only required bi-annually.</p> <p>Tension: 15° deflection.</p> <p>Note: The belt will stretch over time.</p> <p>Do NOT over tighten the belt. This may cause damage to the drive motor.</p>

Task/Component	Frequency	Description
Rotor Seals	Bi-annually	Inspect the seals on the rotor for damage and correct positioning. The seals should slide along with the rotation of the rotor. A service reminder alarm will activate after a set time to check the rotor seals regularly.
Heater	Bi-annually	Inspect the heater, including heating elements, for damage.
Motors	Annually	Inspect the motor and ball bearings for damage, or any unexpected sounds or vibrations.

9.3 Resetting the Service Reminder

Reset Runtime Hours

The dehumidifier alerts you when a filter or seal need to be changed, or when the interval runtime hours for the fans and motor exceed a factory defined threshold. The threshold values for runtime hours may be changed, but only after consulting your Condair representative. For more information about runtime hours, refer to ["Service Level Settings" on page 39](#).

To reset runtime hours:

Menu page > Service Level (password: 1111) > Reset

Reset Alarms

Only reset applicable alarms after performing maintenance, or when complications are resolved. For more information about alarms, refer to ["Alarms" on page 36](#).

Reset the alarm directly if the cause of the alarm has been fixed.

Acknowledge an alarm to remove it from the pending list, if the cause of the alarm is fixed.

When an issue is acknowledged and reset (provided the cause of the alarm is fixed), the alarm will be removed from the pending alarm list.

To acknowledge an alarm:

Menu page > Alarms > Pending Alarms > Details  > Details  > Ack

To reset an alarm, tap on the Reset button when viewing your pending alarms.

10 Troubleshooting

Troubleshooting of the Condair DA Series Desiccant Dryer must only be performed by qualified and competent personnel. Electrical repairs must only be performed by a licensed electrician authorized by the customer, or by Condair service technicians.

Troubleshooting the Condair DA Series Desiccant Dryer may require the user to access the inside of the unit, to the control cabinets, which may expose the user and equipment to hazards described in ["For your Safety" on page 9](#).

10.1 General Troubleshooting

Most operation warning and fault conditions are caused by improper installation, or by not adhering to the suggested best practices for installation of the dehumidifier and system components. Hence, a full fault diagnosis always requires a thorough examination of the entire system (hose connections, control systems, etc.).

General guidelines for troubleshooting are described below. For detailed troubleshooting of auxiliary system components, refer to their respective manuals.

Nothing happens when the On/Off switch is turned On.
No control circuit, or fuse for the controls is faulty. Check the electrical components, including control and main fuses.
Internal circuit breaker has tripped. Check the internal circuit breaker in the dehumidifier.
Faulty control signal. Check the external signal.
Overheat Protection Alarm (OH2) Check the reactivation air filters, fan, airflow, and duct obstructions. Once the issue has been resolved the switch needs to be manually reset.
Phase fault. Check main fuses, breaker, and phase sequence.

Rotor is not moving.
Drive belt is damaged, worn, or slipping. Check the belt and ensure there are no damages, and the belt is not worn. Check the tension of the belt, 15° deflection. The drive belt may need to be replaced.
Drive motor is faulty. Replace the gear motor.
Rotor is jammed. Check the rotor and ensure there are no obstructions at the rim of the rotor and rotor shaft. Ensure that the rotor shaft is undamaged.

No dry air, or no wet air volume is produced.
Internal breakers are flipped. Check the internal breakers.
Filters or ducts are blocked. Check and clean the filters. Replace them if necessary. Check the dampers and ducts, and remove any obstructions.
Phase fault. Check the main fuses and phase sequence.
Faulty fans. Check the fans, motor, and impeller for any damages or obstructions.
Dehumidification capacity reduced, or at zero.
Airflow is reduced. The airflow could be reduced due to clogged filters, leaks in the unit or seals, or altered air volumes. Ensure that the air volumes are measured correctly, and check dampers, openings, ducts, and filters for blockages. Replace filters if necessary. Reduced airflow lowers the drying capacity for the space. Check the internal and external seals, internal springs, and outside panels for air leakage.
Reactivation or process air fans are not working. Check the fans if they are engaged. Verify contactor operation for heaters and fans.
Electrical heater is faulty, or the reactivation temperature has been changed. Check the reactivation heater and check the fuses.
Rotor is not rotating. Check the rotor shaft and rotor rim for blockages or damage. Check the drive belt for wear and proper tension.
Circuit breaker or fuses are faulty.
Air volume is too large. Check the air volumes and dampers. Correct as necessary.
Faulty fans. Check the fans, motor, and impeller for any damages or obstructions.
Rotor is not rotating. Check the rotor shaft and rotor rim for blockages or damage. Check the drive belt for wear and proper tension, 15° deflection.
Electrical heater is faulty, or the reactivation temperature has been changed. Check the reactivation heater and check the fuses.
Contactor seizing. Check the reactivation heater, and check the volume of airflow entering the reactivation side. There is a delay between the heater stages to ensure there is no high current inrush that occurs during startup.

The reactivation air temperature leaving the unit is high (above 200 °F)
<p>Rotor speed no correct.</p> <p>Check the rotation of the rotor and ensure that there are no obstructions on the rim or shaft of the rotor. Any blockages can impede the flow of air through the unit and reduce its output.</p>
<p>Reactivation heat power not turned on.</p> <p>Check that the reactivation heaters are turned on during the cycle.</p>
<p>Airflow of the regeneration air too high.</p> <p>Reduction in airflow reduces the air velocity, allowing the air to remove more moisture from the rotor. This reduction in airflow can be accomplished by adjusting the damper or using a control signal/potentiometer. It's essential to ensure that the airflow is not reduced significantly, as this can result in reduced performance or even damage to the unit.</p>

11 Condair DA Spare Parts List

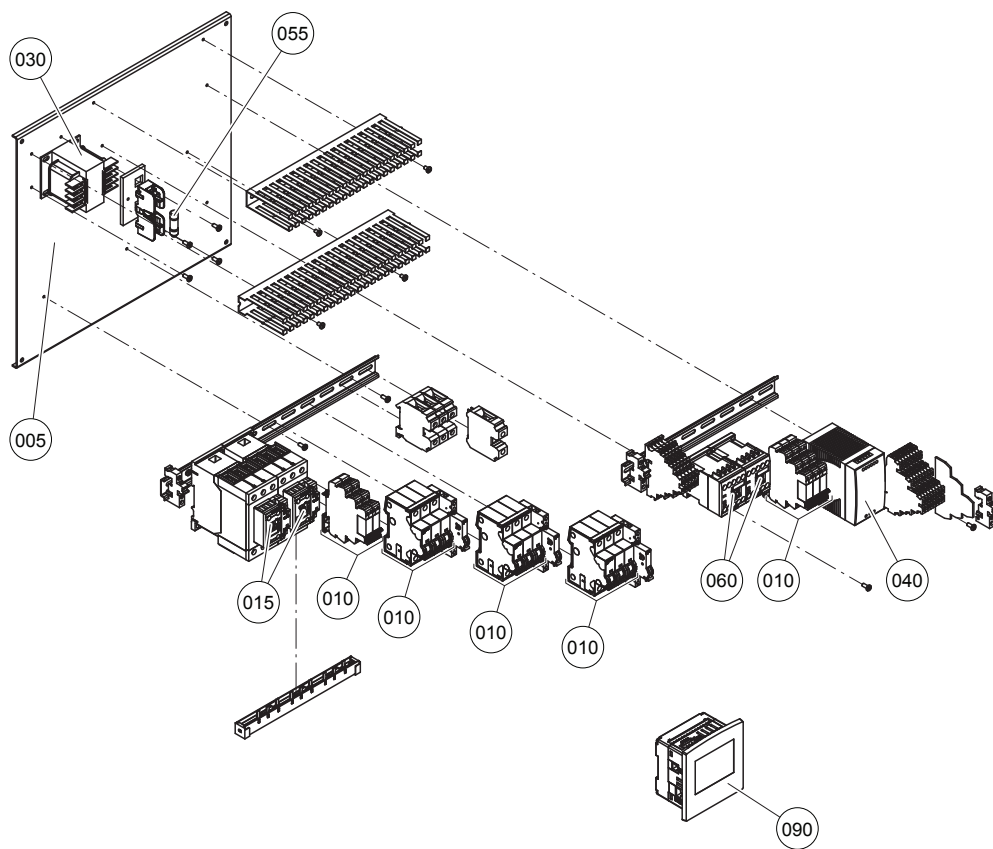


Fig. 8: Spare Parts (Refer to ["Condair DA 300N-800N Parts List" on page 51](#) and ["Condair DA 1400N - 2400N Parts List" on page 53](#))

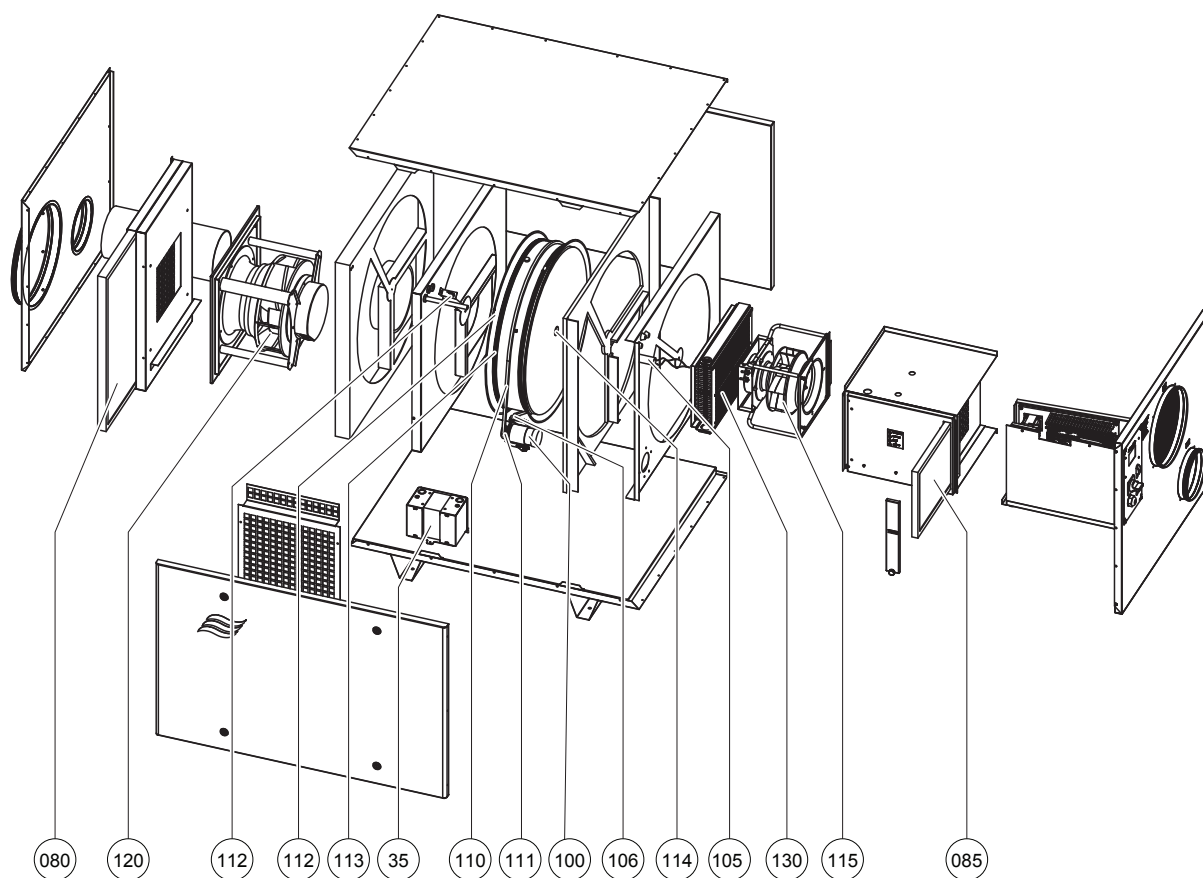


Fig. 9: Spare Parts (Refer to ["Condair DA 300N-800N Parts List" on page 51](#) and ["Condair DA 1400N - 2400N Parts List" on page 53](#))

Table 3: Condair DA 300N-800N Parts List

Item No.	Item Description	Condair DA Model								Part Number
		300N		400N		600N		800N		
		208V/3~	480V/3~	208V/3~	480V/3~	208V/3~	480V/3~	208V/3~	480V/3~	
010	SP MCB, DIN rail, 4 Amps	1	1	1	1	1	1	1	1	2594703
	SP MCB, DIN rail, 13 Amps	1	2	1	2	1	1	1	1	2594704
	SP MCB, DIN rail, 15 Amps	1								2594705
	SP MCB, DIN rail, 16 Amps						1			2594706
	SP MCB, DIN rail, 20 Amps								1	2594707
	SP MCB, DIN rail, 25 Amps			1						2594708
	SP MCB, DIN rail, 32 Amps									2594709
	SP MCB, DIN rail, 63 Amps									2594710
	SP MCB, DIN rail, 40 Amps					1		1		2594732
	015	Contactor, 80AAC1 DIN, 24VDC coil							1	
Contactor, 40AAC1 DIN, 24VDC coil		1	2	1	2	1	2	1	2	2594712
020	Relay module, 24VDC DIN Rail	3	3	3	3	3	3	3	3	2594735
030	Transformer, 208/416: 12/24VAC 50VA	1		1		1		1		2595400
	Transformer, 240/480: 12/24VAC 50VA		1		1		1		1	2595403
035	SP Transformer, 600/480: 240VAC 750VA (Replaces PN: 2595352)	1		1		1		1		2604525
040	Power Supply_AC_DC Converter 24V 96W	1		1		1		1		2595406
	Power Supply_AC_DC Converter 24V 40W		1		1		1		1	2595734
055	SP Fuse Kit, Dehumidifier 480V, (S2) (Replaces PN: 2601283)	1	1	1	1	1	1	1	1	2604526
060	Contactor, 18AAC1 DIN, 24VDC coil	2	2	2	2	2	2	2	2	2594711
080	DA Process Air Filter Kit	1	1	1	1	1	1	1	1	2595407
085	DA Reactive Air Filter	1	1	1	1	1	1	1	1	2594714
090	DA Series Logic Controller	1	1	1	1	1	1	1	1	2594715
100	Drive Motor w Gearbox, Capacitor	1	1	1	1	1	1	1	1	2602554
105	Capacitor, Drive Motor, Dehum	1	1	1	1	1	1	1	1	2594742
106	Belt Tensioner, Dehumidifier	1	1	1	1	1	1	1	1	2602223
107	Rotation Guard Sensor with Magnet	1	1	1	1	1	1	1	1	2602230
110	Drive Belt DA 300/400/600	1	1	1	1	1	1			2602555
	Drive Belt DA 800/1400/2000/2400							1	1	2594718
111	Pulley, Belt Drive DA 300/400/600	1	1	1	1	1	1			2595351
	Pulley, Belt Drive DA 800/1400/2000/2400							1	1	2602222
112	Peripheral Seal DA 300/400/600	1	1	1	1	1	1			2602224
	Peripheral Seal DA 800/1400/2000/2400							1	1	2602225
113	Clamp for Peripheral Seal 300/400/600	1	1	1	1	1	1			2602226
	Clamp for Peripheral Seal 800/1400/2000/2400							1	1	2602227

Item No.	Item Description	Condair DA Model								Part Number
		300N		400N		600N		800N		
		208V/3~	480V/3~	208V/3~	480V/3~	208V/3~	480V/3~	208V/3~	480V/3~	
114	Radial Seal DA 300/400/600	1	1	1	1	1	1			2602228
	Radial Seal DA 800/1400/2000/2400							1	1	2602229
115	SP Fan, Reac. Air, DA 800 480V (S2) (Replaces PN: 2601285)								1	2604530
	SP Fan, Reac. Air, DA 800 208V							1		2601288
	SP Fan, Reac. Air, DA 600 480V, (S2) (Replaces PN: 2601286)						1			2604529
	SP Fan, Reac. Air, DA 600 208V					1				2594720
	SP Fan, Reac. Air, DA 400 480V, (S2) (Replaces PN: 2594720)				1					2604528
	SP Fan, Reac. Air, DA 400 208V			1						2601387
	SP Fan, Reac. Air, DA 300 480V, (S2) (Replaces PN: 2594731)		1							2604527
	SP Fan, Reac. Air, DA 300 208V	1								2601249
120	SP Fan, Poc. Air, DA 800 480V								1	2601251
	SP Fan, Poc. Air, DA 800 208V							1		2601258
	SP Fan, Poc. Air, DA 600 480V						1			2601253
	SP Fan, Poc. Air, DA 600 208V					1				2601259
	SP Fan, Poc. Air, DA 400 480V				1					2601254
	SP Fan, Poc. Air, DA 400 208V			1						2601260
	SP Fan, Poc. Air, DA 300 480V		1							2601255
	SP Fan, Poc. Air, DA 300 208V	1								2601261
125	Rotor, Dehumidifier DA 800-2000							1	1	2601263
	Rotor, Dehumidifier DA 300-600	1	1	1	1	1	1			2601262
130	SP Heater Bank, DA600-800, 500V (Replaces PN: 2601272)						1		1	2604797
	SP Heater Bank, DA 800, 208V							1		2601268
	SP Heater Bank, DA 600, 208V					1				2601267
	SP Heater Bank, DA 400, 500V (Replaces PN: 2601271)				1					2604796
	SP Heater Bank, DA 300, 500V (Replaces PN: 2601270)		1							2604795
	SP Heater Bank, DA 300-400, 208V	1		1						2601265
N/S	SP Switch, Overtemp DA	1	1	1	1	1	1	1	1	2612923

N/S = item not shown

Table 4: Condair DA 1400N - 2400N Parts List

Item No.	Item Description	Condair DA Model						Part Number
		1400N		2000N		2400N		
		208V/3~	480V/3~	208V/3~	480V/3~	208V/3~	480V/3~	
010	SP MCB, DIN rail, 4 Amps	1	1	1	1		1	2594703
	SP MCB, DIN rail, 13 Amps	1	1	1	1		1	2594704
	SP MCB, DIN rail, 15 Amps							2594705
	SP MCB, DIN rail, 16 Amps							2594706
	SP MCB, DIN rail, 20 Amps							2594707
	SP MCB, DIN rail, 25 Amps		1					2594708
	SP MCB, DIN rail, 32 Amps				1			2594709
	SP MCB, DIN rail, 63 Amps	1		1				2594710
	SP MCB, DIN rail, 40 Amps						1	2594732
015	Contactor, 80A AC1 DIN, 24VDC coil	1		1				2594733
	Contactor, 40A AC1 DIN, 24VDC coil	1	2	1	2		2	2594712
020	Relay module, 24VDC DIN Rail	3	3	3	3		3	2594735
030	Transformer, 208/416: 12/24VAC 50VA	1		1				2595400
	Transformer, 240/480: 12/24VAC 50VA		1		1		1	2595403
035	SP Transformer, 600/480: 240VAC 750VA (Replaces PN: 2595352)		1		1		1	2604525
040	Power Supply_AC_DC Converter 24V 96W	1		1				2595406
	Power Supply_AC_DC Converter 24V 40W		1		1		1	2594734
055	SP Fuse Kit, Dehumidifier 480V, (S2) (Replaces PN: 2601283)	1	1	1	1		1	2604526
060	Contactor, 18A AC1 DIN, 24VDC coil	2	2	2	2		2	2594711
080	DA Process Air Filter Kit	1	1	1	1		1	2595407
085	DA Reactive Air Filter	1	1	1	1		1	2594714
090	DA Series Logic Controller	1	1	1	1		1	2594715
100	Drive Motor w Gearbox, Capacitor	1	1	1	1		1	2602554
105	Capacitor, Drive Motor, Dehum	1	1	1	1		1	2594742
106	Belt Tensioner, Dehumidifier	1	1	1	1		1	2602223
107	Rotation Guard Sensor with Magnet	1	1	1	1		1	2602230
110	Drive Belt DA 800/1400/2000/2400	1	1	1	1		1	2594718
111	Pulley, Belt Drive DA 800/1400/2000/2400	1	1	1	1		1	2602222
112	Peripheral Seal DA 800/1400/2000/2400	1	1	1	1		1	2602225
113	Clamp for Peripheral Seal 800/1400/2000/2400	1	1	1	1		1	2602227
114	Radial Seal DA 800/1400/2000/2400	1	1	1	1		1	2602229
115	SP Fan, Reac. Air, DA 2400 480V, (S2)						1	2604793
	SP Fan, Reac. Air, DA 2000 480V, (S2)				1			2604792
	SP Fan, Reac. Air, DA 2000 208V			1				2594740
	SP Fan, Reac. Air, DA 1400 480V, (S2) (Replaces PN: 2594719)		1					2604791
	SP Fan, Reac. Air, DA 1400 208V	1						2601288

Item No.	Item Description	Condair DA Model						Part Number
		1400N		2000N		2400N		
		208V/3~	480V/3~	208V/3~	480V/3~	208V/3~	480V/3~	
120	SP Fan, Poc. Air, DA 2400 480V						1	2604794
	SP Fan, Poc. Air, DA 2000 480V				1			2604800
	SP Fan, Poc. Air, DA 2000 208V			1				2601256
	SP Fan, Poc. Air, DA 1400 480V		1					2601250
	SP Fan, Poc. Air, DA 1400 208V	1						2601257
125	Rotor, Dehumidifier DA 2400						1	2601264
	Rotor, Dehumidifier DA 800-2000	1	1	1	1			2601262
130	SP Heater Bank, DA2400, 500V						1	2604799
	SP Heater Bank, DA1400-2000, 500V (Replaces PN: 2601282)		1		1			2604798
	SP Heater Bank, DA 1400-2000, 208V	1		1				2601269
N/S	SP Switch, Overtemp DA	1	1	1	1	1	1	2612923

N/S = item not shown

11.1 Obtaining Spare Parts

Obtain additional spare parts from your local Condair Agent, or through www.CondairParts.com.

12 Commissioning

12.1 General

The Condair DA Series Desiccant Dryer must be commissioned and operated only by personnel who are adequately qualified and familiar with the Condair DA Series Desiccant Dryer. It is the customer's responsibility to verify the qualifications of personnel.

12.2 First-time Commissioning

The unit must always be commissioned for the first time by a service technician from your Condair representative, or by personnel who are well trained and authorized by the customer. For this reason, this manual only provides an outline, and not the details of the commissioning protocol.

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 and that the main switch on the desiccant dryer is set in the OFF position.
2. Open the service panel of the desiccant dryer and ensure that no foreign objects are left inside the unit or in the electrical compartment.
3. Ensure that the process and reactivation air dampers are open, and that ducts are clean and free of blockages.
4. Check that air filters are installed and clean.
5. Access the fan chambers by removing the panels/safety grids, rotate the fan impellers by hand and make sure they can move freely. After checking the fans, mount the service panels/safety grids back on the unit.
6. Ensure that the mains supply fuse is suitably rated.
7. Mount the main service panel on the desiccant dryer.
8. Connect the desiccant dryer to the main electrical supply by turning the external isolation switch to ON, and check all three phases are live. Terminal L1, L2, L3 in the desiccant dryer.
9. Check to see that the lamp on the PLC called STAND BY is lighting up, but that the machine doesn't start.
10. Start the desiccant dryer for a short moment (approx. 1 minute) by turning the switch on the PLC to the ON respectively MAN position or by pressing "unit on" and "Manuel / Auto" on the PLC. Check that there is no apparent vibration while the fans are ramping up to full speed. Also check that the green operation lamp on the PLC lights up.
11. Stop the desiccant dryer by turning the ON/OFF switch on the PLC to OFF.
12. The reactivation air fan will continue to work for 6 minutes after the unit has been turned OFF on the PLC.
13. The desiccant dryer is now ready for operation.
14. Start the desiccant dryer and check that the unit is operating at the correct air volumes and air pressures by taking measurements in the dry air and wet air ducts.
15. If requested check the dehumidification performance by measuring humidity in the dry air outlet from the desiccant dryer. Compare the result with the performance charts.
16. The dehumidifier is now ready for operation.

Ensure the following:

- Dampers (in reactivation air and process air ducts) are open.
- Ducts are clean and unobstructed.
- There are no foreign objects in the unit (including electrical cabinet).
- Air filters are clean and installed properly.
- Fans can rotate freely. Fans can be accessed by removing the safety panels from the fan housing. Ensure that the safety panels are reinstalled.
- Rotor belt tension is at 15° deflection. The belt will stretch over time, so tension should be adjusted during maintenance.
- Check the pressure at the inlet and outlet ducts of process air side.
- Check rotation direction of the rotor (wiring capacity incorrectly can reverse the rotation).
- Ensure that the service hatch for the reactivation air section is properly sealed to prevent any air leakage.
- Check the power consumption of the overall unit using an amp clamp. The power consumption value should match the unit specification label.
- Check to confirm that the air entering the unit is not contaminated or polluted.
- Inspect the area underneath the rotor for any powder duct. If any is present, please use a brush to remove it from the inside of the unit.

13 Decommissioning

13.1 General

If the Condair DA Series Desiccant Dryer needs to be replaced or removed from service for disposal, strictly follow the instructions in this section.

Personnel Qualifications

All decommissioning work must be performed only by a qualified service technician authorized by the customer. It is the customer's responsibility to verify proper qualifications of the personnel.

Safety

Refer to ["For your Safety" on page 9](#) .

13.2 Removing Unit from Service

Remove the unit from service for disposal, or long-term storage, as follows. Use a qualified service technician.

1. Disconnect the humidifier from the power source.
2. Disconnect the control signal inputs (including any power and security loop connections) from the terminal strips in the humidifier.
3. Remove the Condair DA Series Desiccant Dryer from its mounting surface.
4. If the unit is to be disposed, refer to ["Disposing or Recycling the Unit"](#) below.

13.3 Disposing or Recycling the Unit

The Condair DA Series Desiccant Dryer and its components must NOT be disposed in domestic waste, and should be brought to an authorized collection point. If required, dispose in accordance with local regulations at authorized collection facilities.

If you have any questions, please contact the appropriate local authorities, or your local Condair representative.

14 Appendix A

14.1 Appendix A-1: Installation Checklist

Mounting

- ☐ Unit installed in a suitable location? Refer to ["Ambient Requirements" on page 19](#).
- ☐ Unit installed with suitable clearances? Refer to ["Clearance Requirements" on page 20](#).
- ☐ Mounting surface is stable and capable of supporting the full operating weight of the unit? Refer to ["Technical Specification" on page 16](#).
- ☐ Unit is level?
- ☐ Unit is fastened securely?

Electrical Connection

- ☐ Power supply meet the voltage and current requirements shown on the specification label? Refer to ["Model Designation" on page 13](#).
- ☐ All cables fastened securely?
- ☐ All electrical connections meet applicable codes?
- ☐ Electrical installation meet the applicable national and local codes?

14.2 Appendix A-2: Maintenance Checklist

Follow all safety precautions. Refer to ["For your Safety" on page 9](#). Shut down the unit before performing maintenance procedures. Refer to ["Shutting Down the Unit" on page 43](#). Do NOT ignore alarms. Refer to ["Troubleshooting" on page 46](#).

Refer to ["Maintenance List" on page 44](#) and "Maintenance Procedures" for descriptions on maintenance procedures.

Table 5: Maintenance Log

Component	Frequency Dates	Last Performed (DD/MM/YY) and Initials					
Filters	Monthly or as needed						
Rotor (and bearings)	Annually - contact Condair representative						
Rotor Drive Belt	Bi-annually						
Rotor Seals	Bi-annually						
Heater	Bi-annually - visually inspect the heater. Replace if necessary. Contact Condair representative.						
Motors	Annually						
Comments:							

14.3 Appendix A-3: Wiring Diagrams

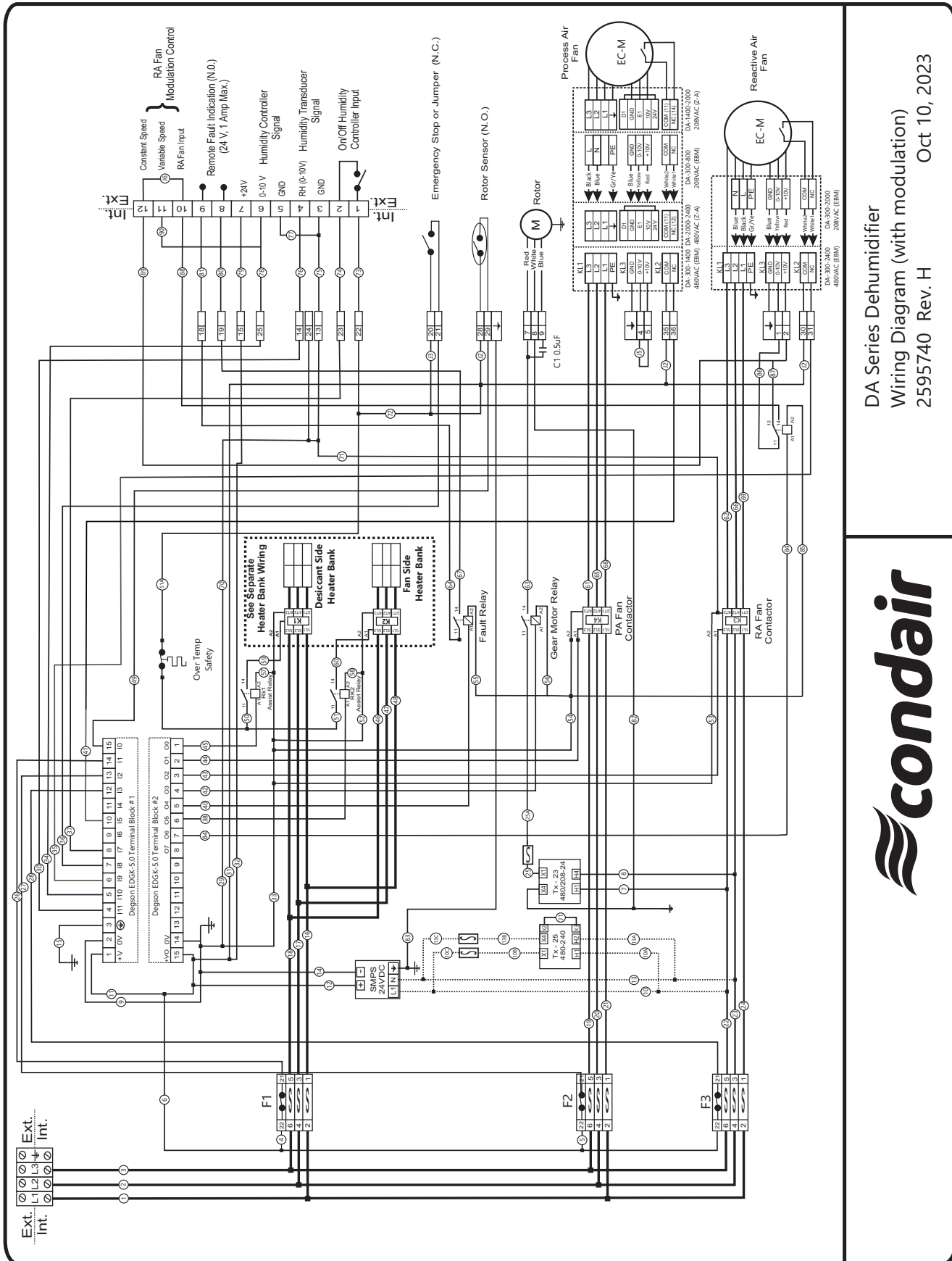
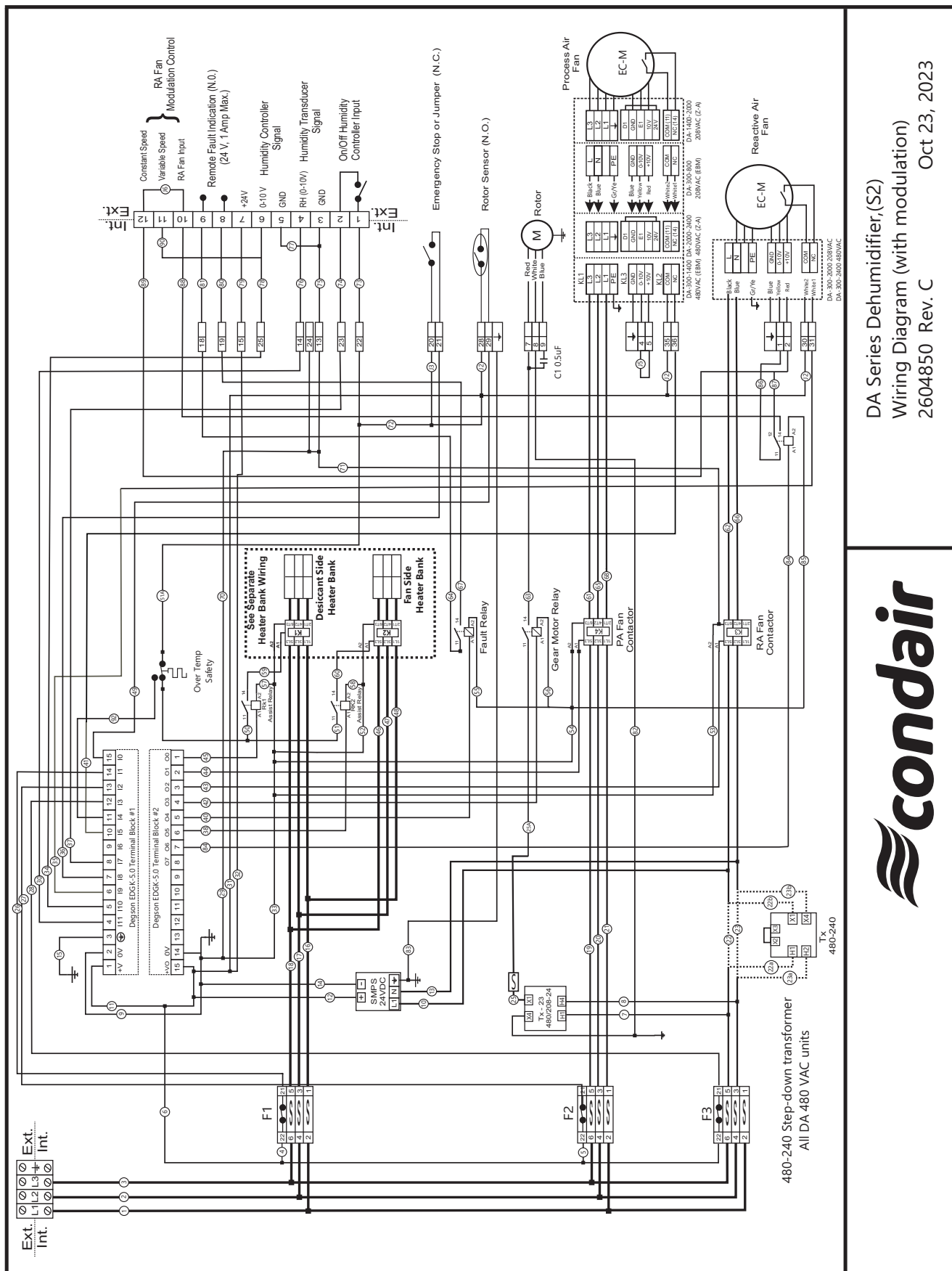


Abb. 1: Wiring Diagram for DA Series Dehumidifiers 208V - Refer to the wiring diagram on the actual unit



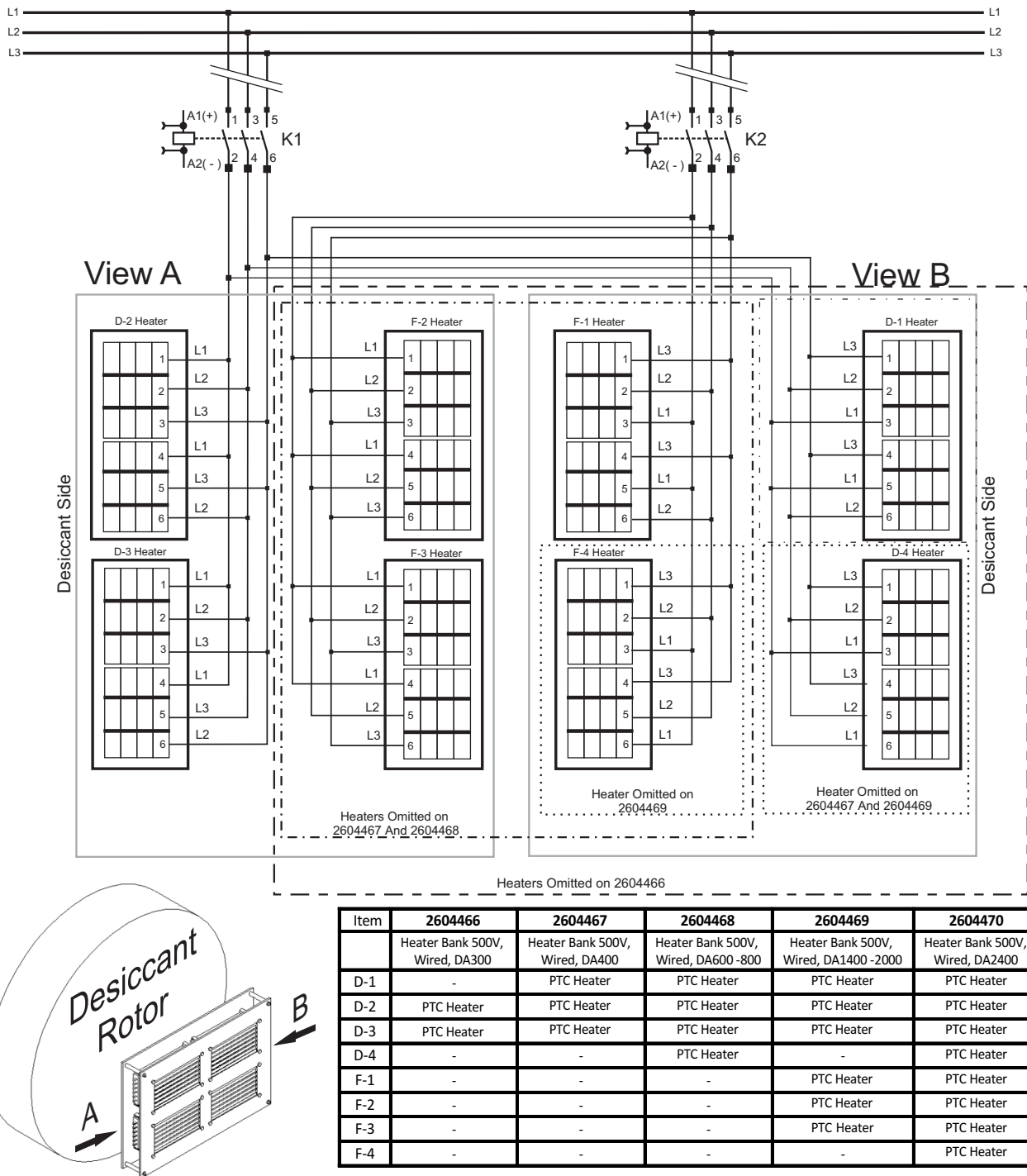
DA Series Dehumidifier (S2)
Wiring Diagram (with modulation)
2604850 Rev. C

Oct 23, 2023



Abb. 2: Wiring Diagram DA Series Dehumidifiers 480V (S2) - Refer to the wiring diagram on the actual unit

**500 VAC Dehumidifier
Heater Bank Wiring
(Supplement to Wiring Diagram 2604850)**



condair

DA 500VAC HEATER BANK,(S2)

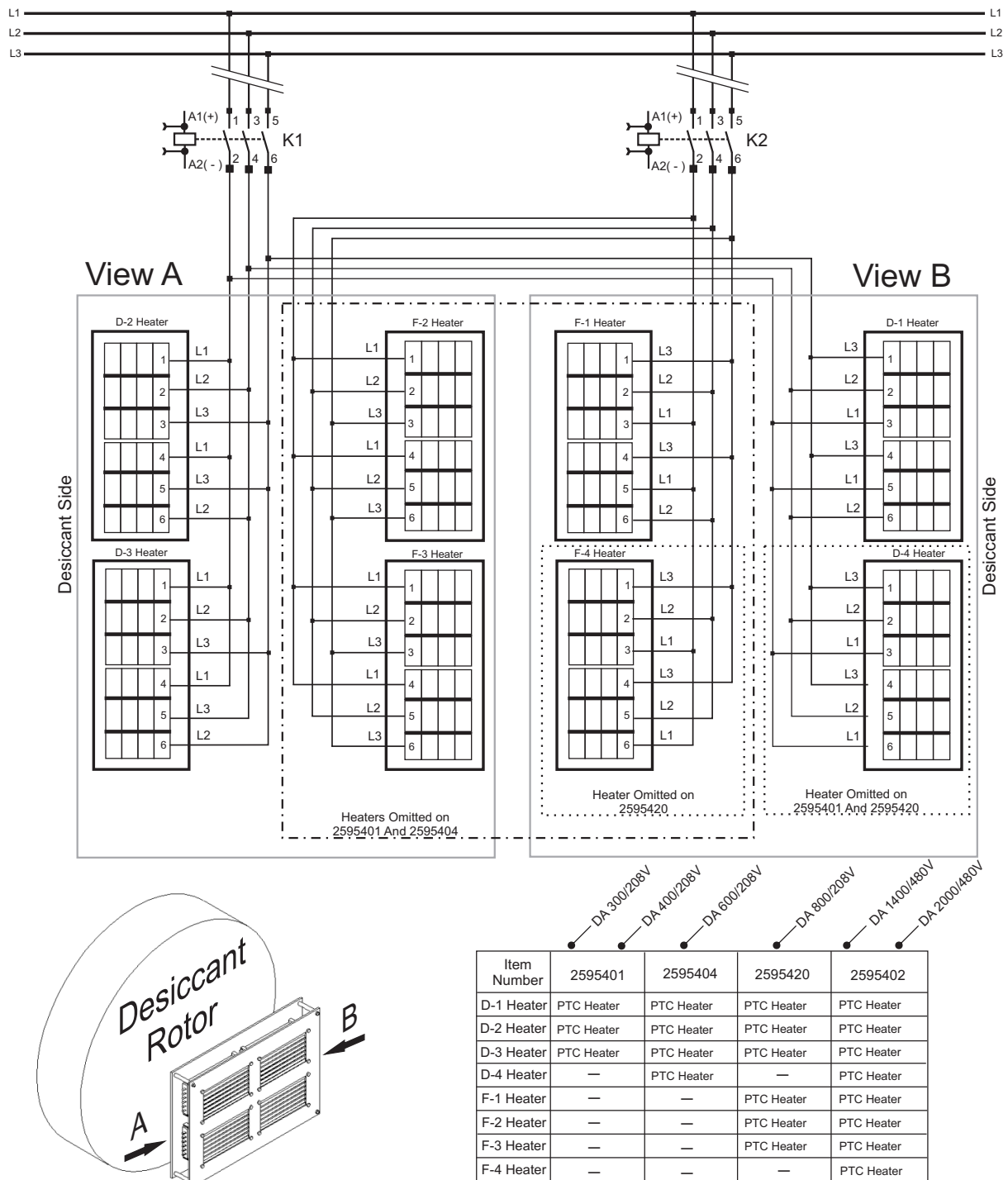
Wiring Diagram

2604480 Revision: B

Date: 02/21/2023

Fig. 10: DA 500VAC (S2) Heater Bank Wiring Diagram

208 VAC Dehumidifier Heater Bank Wiring (Supplement to Wiring Diagram 2595740)



condair

DA 208VAC HEATER BANK

Wiring Diagram

2597584 Revision: B

Date: 02/21/2023

Fig. 11: DA 208VAC Heater Bank Wiring Diagram

14.4 Appendix A-4: Communication

14.4.1 Modbus

The Condair DA Desiccant Dryer can be ordered with optional Modbus TCP/IP or Modbus RS485 network cards installed in the unit's PLC. Connections can be made with an Ethernet (RJ45) or RJ11 cable.

Note: The Condair DA Desiccant Dryer supports Modbus RTU with RS 232 interfaces.

Table 6: RS 232 Pin Interfaces

Pin #	RS 232 (Port 1)	Notes
1	Not connected	Signals are related to the controller's 0V; the same 0 V is used by the power supply. The serial port is not isolated. If the controller is used with a non-isolated external device, avoid potential voltage that exceeds $\pm 10V$. Maximum cable length 50 ft (15 m).
2	0V	
3	TDX signal	
4	RDX signal	
5	0V	
6	Not connected	

14.4.1.1 RS485 Connection

Connect using RJ11 connector provided (Blue Wire: RS485 A+, White/Blue: RS485 B-).

By default, the RS485 signals are terminated by two wire ferrules coming from the RJ11 connector.

Note: RJ45 connector can be used instead.

Table 7: RS 485 Connection

Wire	Color	Notes
RS485 A+	Blue	The ground is connected in the shielding of the RJ11 twisted pair connector. Use a shielded twisted pair wire. Use a 2-wire splicing connector to connect the two ferrules from RJ11 (or other similar connector) to extend the cables. Maximum cable length 4000 ft (1200 m).
RS485 B-	White/Blue	

PLC Software Configuration

1. Power up the PLC.
2. Navigate to **Menu > Communication Setup**
3. Enter the user level password: 4498
4. Enter a Modbus slave ID. The default is 35.
5. Navigate to RS485 settings. Select one of the following serial communication options.
 - 9600 Baud, 8 bits, No Parity, 1 Stop Bit
 - 9600 Baud, 8 bits, Even Parity, 1 Stop Bit
 - 19200 Baud, 8 bits, No Parity, 1 Stop Bit
 - 19200 Baud, 8 bits, Even Parity, 1 Stop Bit
 - 57600 Baud, 8 bits, No Parity, 1 Stop Bit
 - 57600 Baud, 8 bits, Even Parity, 1 Stop Bit
6. Enter the Modbus Network ID (range is 0 to 999).
7. Press SAVE

14.4.2 TCP/IP Network Settings

Connect a CAT V RJ45 Ethernet cable (shielded twisted pair) to Port 2 on the PLC.

1. Power up the PLC
2. Navigate to **Menu > Communication Setup**
3. Enter the user level password: 4498
4. The display will note the installation of an Ethernet card. Navigate to Modbus TCP/IP settings.
5. Enter the IP address, default gateway, and subnet mask.
6. Validate the network connection.
 - a. Connect an RJ45 Ethernet cable from the PLC port to a computer.
 - b. Open the command prompt terminal (enter "cmd" from the start menu).
 - c. Enter "ping" and the IP address you created in step 5.
Ex. > **ping 192.168.0.150**
 - d. If there are lost packets, there is no connection. Check the Ethernet connection and IP address and try again.

14.4.3 Modbus Datapoints

Table 8: Analog and Misc. Datapoints

RS232, ID: 35 Bitude: 9600, Parity: None, Stop bits: 1						MBA	MBE	Format
Holding Register	Coil Status	Read/ Write	INFO	Text / Info	Var.			
Analog inputs								
70		R		Humidity sensor	% RH	0	100	##
76		R		0-10V dehumidification control	VDC	0.0	10.0	##.#
Analog setpoint								
9		R/W		Humidity setpoint for humidity sensor	% RH	50	-	##
Misc								
	2	R/W	1=On	Unit on/off	1/0	-	-	-
	3	R	1=On	Urgent alarm	1/0	-	-	-
	4	R	1=On	Non urgent alarm	1/0	-	-	-
	13	R/W	1=On	Cooling time react. Air fan	1/0	-	-	-
	15	R/W	1=Auto	Unit automatic/manual mode	1/0	-	-	-
	27	R/W	1=On	Continuous process air fan	1/0	-	-	-

Table 9: Input and Output Datapoints

RS232, ID: 35 Bitude: 9600, Parity: None, Stop bits: 1						MBA	MBE	Format
Holding Register	Coil Status	Read/ Write	INFO	Text / Info	Var.			
Digital inputs (Read)								
	24576	R	1=On	Rotation guard sensor	1/0	-	-	-
	24577	R	1=On	Circuit breaker, react. Heater	1/0	-	-	-
	24578	R	1=On	Circuit breaker, process air fan	1/0	-	-	-
	24579	R	1=On	Circuit breaker, react. Air fan/Drive motor	1/0	-	-	--
	24580	R	1=On	Overheating protection OH2	1/0	-	-	-
	24581	R	0=On	Proc. air fan, thermal protection/ alarm	1/0	-	-	--
	24582	R	1=On	Filter guard (option)	1/0	-	-	-
	24583	R	1=On	External start/Humidistat	1/0	-	-	-
	24584	R	0=On	External stop/Stop button	1/0	-	-	-
	24585	R	0=On	React. Air fan, thermal protection/ alarm	1/0	-	-	-
Digital outputs (Read)								
	16384	R	1=On	React. Heater step 1	1/0	-	-	-
	16385	R	1=On	Process air fan	1/0	-	-	-
	16386	R	1=On	React. Air fan	1/0	-	-	-
	16387	R	1=On	Drive motor	1/0	-	-	-
	16388	R	1=On	Alarm indication	1/0	-	-	-
	16389	R	1=On	React. Heater step 2	1/0	-	-	-
	16390	R	1=On	React. air fan 10V control relay	1/0	-	-	-

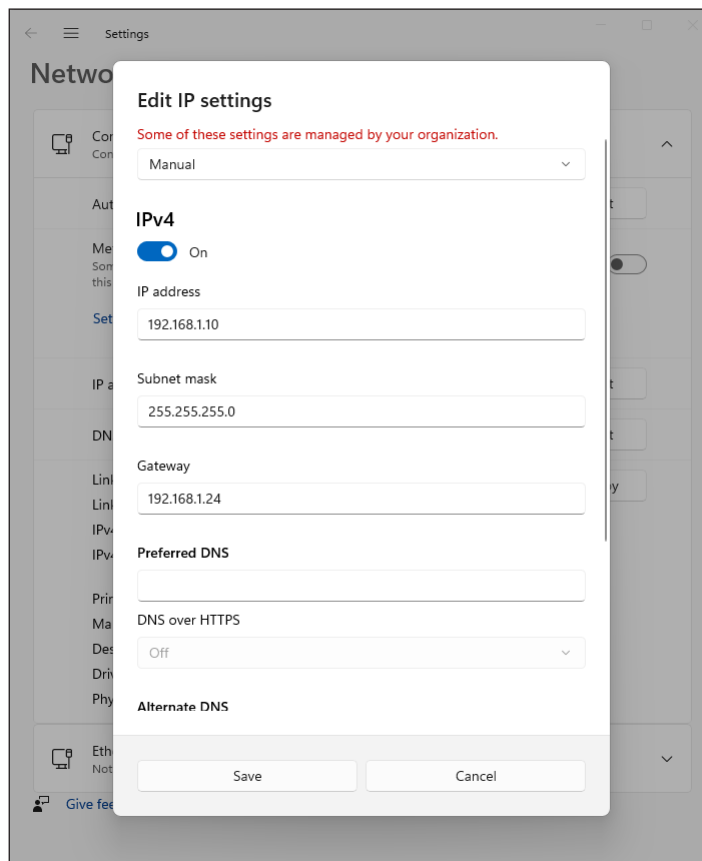
14.4.4 BACnet

The Condair DA Desiccant Dryer can be ordered with optional FieldServer gateway card factory installed to translate DA Desiccant Dryers Modbus TCP (fixed IP) into four optional protocols with configurable IP, node and other settings.

14.4.4.1 Network Settings

When factory installed, CAT 5 Ethernet cable is connected from the PLC to gateway at ETH1 port. Connect a CAT 5 Ethernet cable to ETH2 on the gateway module which will be connected to the Building Management System (BMS)

1. Power up the unit.
2. On the PLC User Interface navigate to Menu > Communication Setup.
3. Enter the user level password: 4498
4. The display will note the installation of an Ethernet card. Navigate to Modbus TCP/IP settings.
5. Note the default PLC IP address, gateway, subnet mask and the Modbus network ID.
6. Use a PC to validate the network connection.
 - a. Connect an RJ45 Ethernet cable from gateway port (ETH2) to a computer.
 - b. Use network settings to configure the computer's ethernet IP settings to connect to the Gateway.
 - c. Configure PC address to same subnet as IP address of gateway (see label on gateway), set default gateway to IP address of the gateway.



Note: Above image shows network settings for Windows 11

- d. Using a web browser enter the IP address and login with the following credentials.

Username: **admin**

Password: **See label at the gateway (or scan QR code)**

14.4.4.2 Configure the Gateway

- Under the Configuration Parameters, select/change the communication for either IP or MSTP network:

BACnet IP	BACnet MSTP
<ul style="list-style-type: none"> Select "1" in Protocol Selector Click Submit Click System Restart Select/Adjust Desired Parameters Click Submit Click System Restart 	<ul style="list-style-type: none"> Select "2" in Protocol Selector Click Submit Click System Restart Select/Adjust Desired Parameters Click Submit Click System Restart

- Add DA Device - Under Active Profiles – Click **<Add>**.

- Enter values below depending on type of connection (BACnet IP or BACnet MSTP):

BACnet IP	BACnet MSTP
<ul style="list-style-type: none"> • Enter Node ID as 1 • Select BAC_IP_DA • Parameters Ip_address: 192.168.0.150 TCP_id: Enter the PLC's Modbus Network ID that was noted above • Click System Restart 	<ul style="list-style-type: none"> • Enter Node ID: Enter the PLC's Modbus Network ID that was noted above • Select BAC_MSTP_NA • Click Submit • Click System Restart

Example after entering values (example is for BACnet IP)

Active profiles

Nr	Node ID	Current profile	Parameters
1	1	MOD_TCP_to_BAC_IP_DA	ip_address : 192.168.0.150 tcp_id : 35

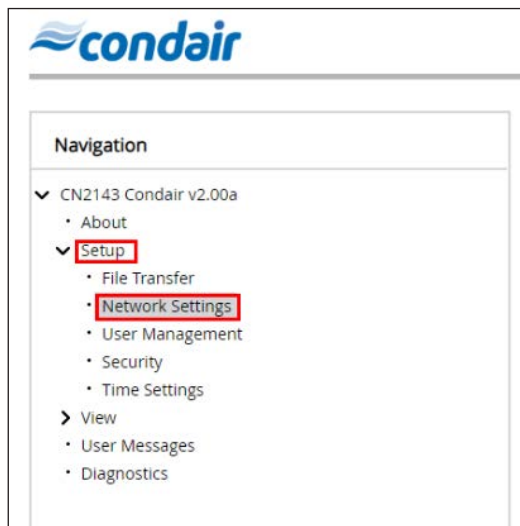
Buttons: Add, Remove

Footer: HELP (?), Clear Profiles and Restart, System Restart, Diagnostics & Debugging, fieldserver

- The gateway configuration is complete.

14.4.4.3 Changing IP Addresses/ Troubleshooting

- Connect computer and login to gateway as described in point 6 above.
- Click Diagnostics & Debugging
- Click Setup > Network Settings



- In Network settings you can assign an IP address for ETH1 (For PLC and Gateway Network) or ETH2 (For PC or BACnet network), set up a rule for the output ethernet port.

Network Settings

ETH 1 ETH 2 Routing

☐ Enable DHCP

IP Address
192.168.0.24

Netmask
255.255.255.0

Gateway
192.168.0.1

- Set ETH1 IP address to connect to PLC or set ETH2 IP address to connect to the laptop (BMS).

ETH 1 ETH 2 Routing

Mode
WAN LAN

☐ Enable DHCP

IP Address
192.168.3.100

Netmask
255.255.255.0

Gateway
192.168.3.1

- Default routing priority is set to ETH2 and should not be changed. In case of communication issues check that this is set correctly.

ETH 1 ETH 2 Routing

Set up the IP routing rules of your FieldServer for internet access and access to other networks.

If you want to reach another device that is not connected to the local network, you can add a rule to determine on which gateway the device must be routed to.

Interface	Destination Network	Netmask	Gateway IP Address	Priority ?
ETH 2	Default	-	192.168.3.1	255

+ Add Rule

Cancel Save

BACnet Object Table

Object name	Object ID	Read/Write	Text / Info	Value
Analog Inputs				
ANALOG INPUT 0	001	R	Humidity sensor	0.0 – 100.0 % rH
ANALOG INPUT 1	002	R	0-10V Dehum Control	0.0 – 10.0 V
Analog Outputs				
ANALOG OUTPUT 0	003	R/W	Humidity Setpoint	50.0 % rH
Digital Value				
BINARY VALUE 0	004	R/W	Unit on/off	1=On
BINARY VALUE 1	007	R	Cooling time react. Air fan	1=On
BINARY VALUE 2	008	R	Unit automatic/manual mode	1=On
BINARY VALUE 3	009	R/W	Continuous process air fan	1=On
Digital Inputs				
BINARY INPUT 0	005	R	Urgent Alarm	1=On
BINARY INPUT 1	006	R	Non-Urgent Alarm	1=On
BINARY INPUT 2	010	R	Rotation Guard Sensor	1=On
BINARY INPUT 3	011	R	Circuit Brk React Heater	1=On
BINARY INPUT 4	012	R	Circuit Brk Process Air Fan	1=On
BINARY INPUT 5	013	R	Circuit Brk React Air Fan/ Drive Mtr	1=On
BINARY INPUT 6	014	R	Overheating Protection OH2	1=On
BINARY INPUT 7	015	R	Proc Air Fan Thermal Protect Alarm	0=On
BINARY INPUT 8	016	R	Filter Guard	1=On
BINARY INPUT 9	017	R	External Start Humidistat	1=On
BINARY INPUT 10	018	R	External Stop Stop Button	0=On
BINARY INPUT 11	019	R	React Air Fan Thermal Protect Alarm	0=On
BINARY INPUT 12	020	R	React Heater Step 1	1=On
BINARY INPUT 13	021	R	Process Air Fan	1=On
BINARY INPUT 14	022	R	React Air Fan	1=On
BINARY INPUT 15	023	R	Driver Motor	1=On
BINARY INPUT 16	024	R	Alarm Indication	1=On
BINARY INPUT 17	025	R	React Heater Step 2	1=On
BINARY INPUT 18	026	R	React Air Fan 10V Control Relay	1=On

15 Appendix B: Additional instructions pre- and post-cooling modules

15.1 Before you begin

The following additional instructions provides guidelines for the installation, operation, and maintenance of Condair-supplied pre- and post-cooling modules when paired with Condair DA Series desiccant dryers to ensure proper performance and longevity. Please observe and comply with all information and safety instructions contained in this sections, as well as all relevant documentation of components of the installed dehumidification system.

If you have additional questions, please contact your Condair representative. They will be glad to assist you.

15.2 Notes on the additional instructions

15.2.1 Limitation

These additional instructions are restricted to the **installation, operation, and maintenance of Condair supplied pre- and post-cooling modules for use with Condair DA desiccant dryers** and is meant for **well-trained personnel being sufficiently qualified for their respective work**.

15.2.2 For your safety

General

Every person, who is in charge of the installation and maintenance of the cooling modules must have read and understood these additional instructions before carrying out any work.

Knowing and understanding the contents of these additional instructions is a basic requirement for protecting personnel against any kind of danger, preventing faulty operation, and operating the equipment safely and correctly.

Qualification of personnel

The installation and maintenance of the cooling modules **may only be carried out by a qualified party or individual who is authorized by the customer**.

It is assumed that all persons working with the cooling modules are familiar and comply with the appropriate regulations on work safety and the prevention of accidents.

Cold-water supply lines must only be designed and executed by qualified personnel considering the respective relevant local regulations.

Intended use of the pre- and post-cooling modules

The cooling modules are intended exclusively for use with the corresponding Condair DA desiccant dryer for dehumidification processes within specified operating conditions.

Any other type of application, without the written consent of Condair, is considered as not conforming with the intended purpose and may lead to hazardous operation of the cooling modules and will void any warranty.

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

**WARNING!**

Protective equipment such as safety glasses, steel toe boots, and gloves are recommended during the installation and routine maintenance of the cooling module.

**WARNING!**

The cooling coil fins have sharp edges. Always wear protective gloves when working with coils.

15.3 Receiving and Storage

15.3.1 Inspection

Inspect the received shipment as follows:

- Inspect the shipping box for damage. Report any shipping box damage to the shipping company without delay.
- Check the received items against the packing slip to ensure that all items have been delivered. Report any shortages to your Condair representative within 48 hours of receipt of the items. Condair does not accept responsibility for any material shortages beyond this period.
- Unpack the items and check for any damage. If items are damaged, notify the shipping company immediately.
- The standard delivery includes the cooling modules as ordered packed in cardboard boxes. Please note that Condair does not supply as part of the delivery of the cooling module, the cooling coil valves, temperature sensor, and controller required to operate the coil. Please contact your Condair representative for the size of valve that will be required for your specific site operation.
- Verify the specification label of the product to ensure that it is suitable for your installation.

15.3.2 Storage and transportation

Storing

Until installation, store the cooling modules in their original packaging in a protected area meeting the following requirements:

- Room temperature: 41 ... 104 °F (5 ... 40 °C)
- Room humidity: 10 ... 75 %RH

Transportation

For optimum protection always transport the cooling modules in their original packaging and use appropriate lifting/transporting devices.

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.

15.4 Product Overview

15.4.1 General description

Condair DA Series desiccant dryers can be supplied with chilled water pre-and post-cooling modules to improve the dehumidification process. These are fluid coils consisting of copper tubes and water connections with aluminum fins mounted in a stainless-steel casing and supplied with a drain pan. Condair supplies cooling modules that have been optimized for operation with the corresponding DA desiccant dryer. Refer to [Section 15.4.3](#) for more information.

15.4.2 Functional description

Chilled water enters the cooling module through the water inlet located at the bottom of the cooling module. As it flows through the coil tubes, it picks up the heat of the air moving across the fins. The water leaves the coil through the return water connection at the top of the cooling module.

All Condair coils are sized for operation with chilled water at a supply temperature of 43 °F (6 °C) and a return temperature of 53 °F (13 °C). If your site's chilled water system has different supply and return temperatures, please contact Condair before installation to verify and certify the performance of the cooling module.

15.4.2.1 Pre-cooling module

The pre-cooling module is installed upstream of the dehumidifier and will reduce the process air moisture content before it enters the desiccant dryer. The air leaving the pre-cooling coil is drier, cooler and is at or very close to saturation (100 %RH). This latent cooling process creates condensate that is collected in the drain pan of the cooling module.

Note: Any ductwork installed after the pre-cooling module and the dehumidifier must incorporate a suitable condensate trap.

15.4.2.2 Post-cooling module

The post-cooling module is installed downstream of the dehumidifier and its sole purpose is to remove sensible heat to lower the temperature of the supply air to meet the desired room air temperature.

Note: The post-cooling coil is intended to adjust the temperature of the air only. The coil must not generate condensate, otherwise the dehumidification process will not be controlled accurately.

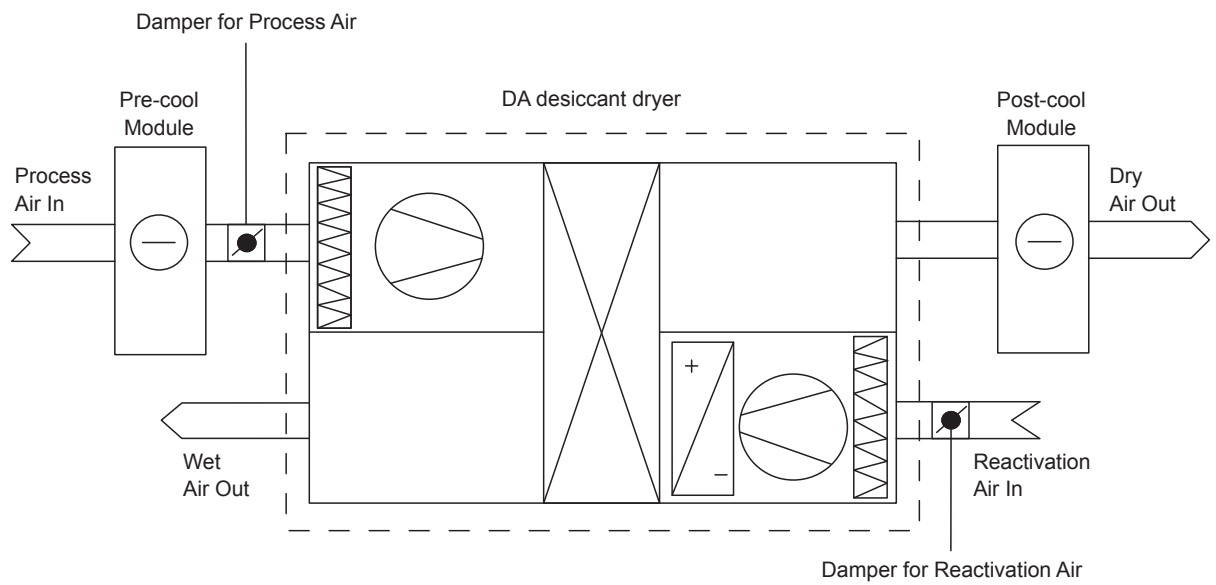


Fig. 12: DA desiccant dryer and cooling modules functional diagram

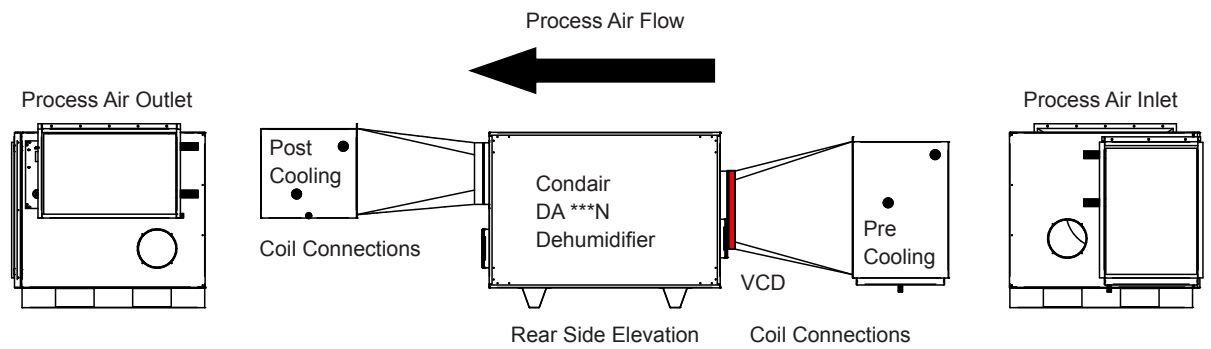


Fig. 13: Installation layout of the cooling modules with the DA desiccant dryer

15.4.3 Product specifications

15.4.3.1 Pre-cooling module

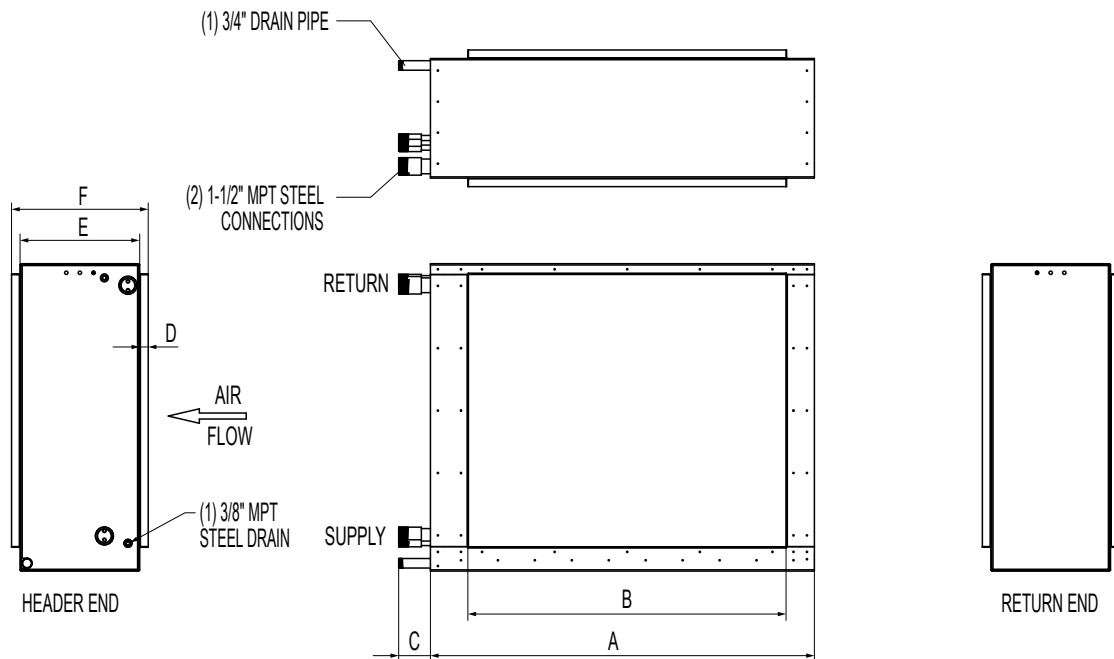


Fig. 14: Pre-cooling module drawing

Table 10: Condair DA Series pre-cooling modules

DA model	Pre-cooling modules								
	Max. cooling capacity kW	Height (A) In	Length (B) In	Length (C) In	Depth (D) In	Dept (E) In	Dept (F) In	MPT/ Actual OD	MPT / Actual OD
								Supply	Return
DA 300N	7.0	29.31	22	3.5	1	13.19	15.06	1.5 / 1.9	1.5 / 1.9
DA 400N	12.0	29.31	22	3.5	1	13.19	15.06	1.5 / 1.9	1.5 / 1.9
DA 600N	17.0	29.31	22	3.5	1	13.19	15.06	1.5 / 1.9	1.5 / 1.9
DA 800N	17.0	29.31	22	3.5	1	14.19	16.06	1.5 / 1.9	1.5 / 1.9
DA1400N	34.0	29.31	22	3.5	1	16.69	18.56	1.5 / 1.9	1.5 / 1.9
DA2000N	34.0	42.31	35	3.5	1	15.19	17.06	1.5 / 1.9	1.5 / 1.9
DA2400N	48.0	42.31	35	3.5	1	15.69	17.56	1.5 / 1.9	1.5 / 1.9

15.4.3.2 Post-cooling module

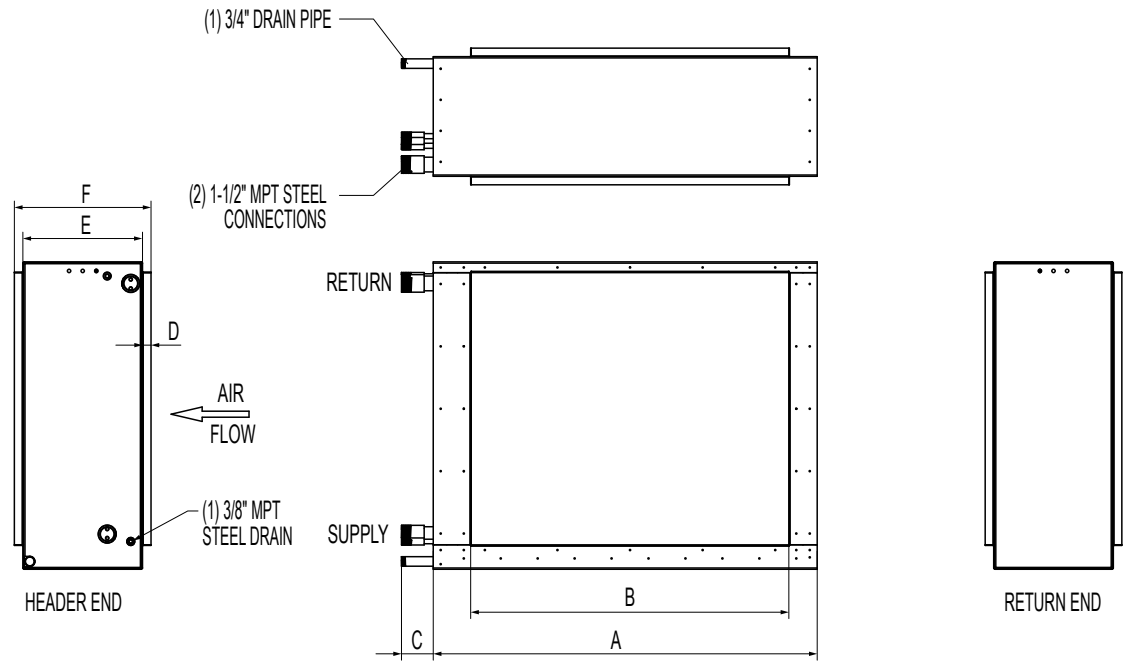


Fig. 15: Post-cooling module drawing

Table 11: Condair DA Series post-cooling modules

DA model	Post-cool modules								
	Max cooling capacity kW	Height (A) In	Length (B) In	Length (C) In	Depth (D) In	Dept (E) In	Dept (F) In	MPT/ Actual OD	MPT / Actual OD
								Supply	Return
DA 300N	2.3	22.31	14	3.5	1	13.19	15.06	1.5 / 1.9	1.5 / 1.9
DA 300N	11.0	31.31	24	3.5	1	13.19	15.06	1.5 / 1.9	1.5 / 1.9
DA 400N	11.0	31.31	24	3.5	1	13.19	15.06	1.5 / 1.9	1.5 / 1.9
DA 600N	15.0	31.31	24	3.5	1	13.19	15.06	1.5 / 1.9	1.5 / 1.9
DA 800N	21.0	31.31	24	3.5	1	13.19	16.06	1.5 / 1.9	1.5 / 1.9
DA1400N	36.0	39.31	32	3.5	1	13.19	18.56	1.5 / 1.9	1.5 / 1.9
DA2000N	50.0	42.31	35	3.5	1	13.19	17.06	1.5 / 1.9	1.5 / 1.9
DA2400N	56.0	42.31	35	3.5	1	13.19	17.56	1.5 / 1.9	1.5 / 1.9

15.5 Installation

15.5.1 Location requirements

- Install the pre-cooling module in the large process air inlet duct ideally within 2 meters (6 ft) of the DA unit. For installations where this distance cannot be achieved, please contact your Condair representative before installation.
- Install the post-cooling module in the large process air outlet duct ideally within 2 meters (6 ft) of the DA unit. For installations where this distance cannot be achieved, please contact your Condair representative before installation.
- Install the cooling module in a location that allows proper air distribution across the cooling coil face to maintain the performance of the cooling coil: the variation of the airflow across the coils should remain below 20%.
- Maintain proper clearance between the cooling module and other structures such as fans and filter racks. As well, avoid installing the cooling module near bends and turns in the ductwork.
- Install a drain line trap on the condensate outlet of the cooling module: the trap should be sized for the system duct pressure.

15.6 Installation procedure

The cooling coil is arranged to provide counter-flow: the air flows in the direction opposite to the water flow inside the coil. Failing to pipe the cooling module in counter-flow will reduce the performance of the cooling module. Condair supplied cooling modules are left-hand coils (see [Fig. 16](#)).

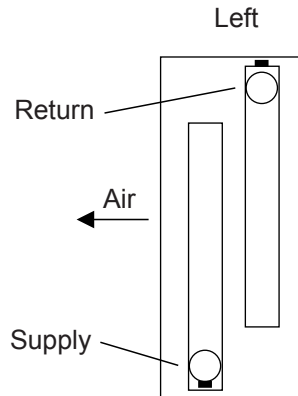


Fig. 16: Cooling module connection locations

If you are unsure about any portion of the installation, contact your Condair representative for assistance.

1. Carefully remove the coil from the shipping package to avoid damage to the finned surface area.
2. Use an appropriate fin comb to straighten any bent or damaged fins.
3. Condair recommends cleaning the coil with a commercially available coil cleaner before installation. Refer to the Maintenance section for cleaning recommendations.
4. The cooling module must be mounted level to ensure proper draining. Level the cooling module for a horizontal airflow with horizontal tubes application. See [Fig. 17](#) below.

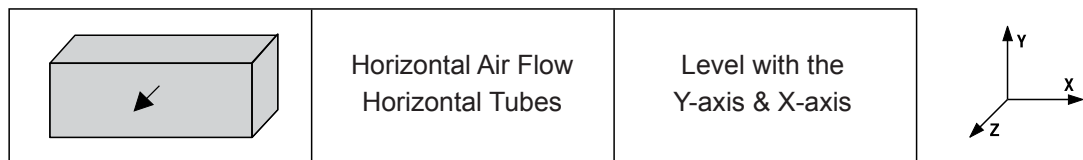


Fig. 17: Leveling of the cooling module

5. All field piping used for the installation of the cooling module must be self-supporting. Ensure the system piping is flexible enough to allow for thermal expansion and contraction of the coil.
6. Install the cooling module according to the piping diagram shown in [Fig. 18](#).
 - 6.1 Connect the chilled water pipe to the supply connection located at the bottom of the air leaving side.
 - 6.2 Connect the return water pipe to the return connection at the top of the air entering side.
7. Install the drain pan and associated piping (downslope drain line and trap) so that there is no standing water in the drain pan and that no blow-through occurs.

Note: The customer is responsible for providing and the installation of a rectangular to round duct transition to facilitate airflow from the leaving side of the pre-cooling module to the circular inlet connection of the desiccant dryer and a round to rectangular duct transition to facilitate airflow from the circular outlet connection of the desiccant dryer to the entering side of the post-cooling module.



CAUTION!

Failure to properly install the coil can result in irreparable damage to the cooling module as well as other components in the system.

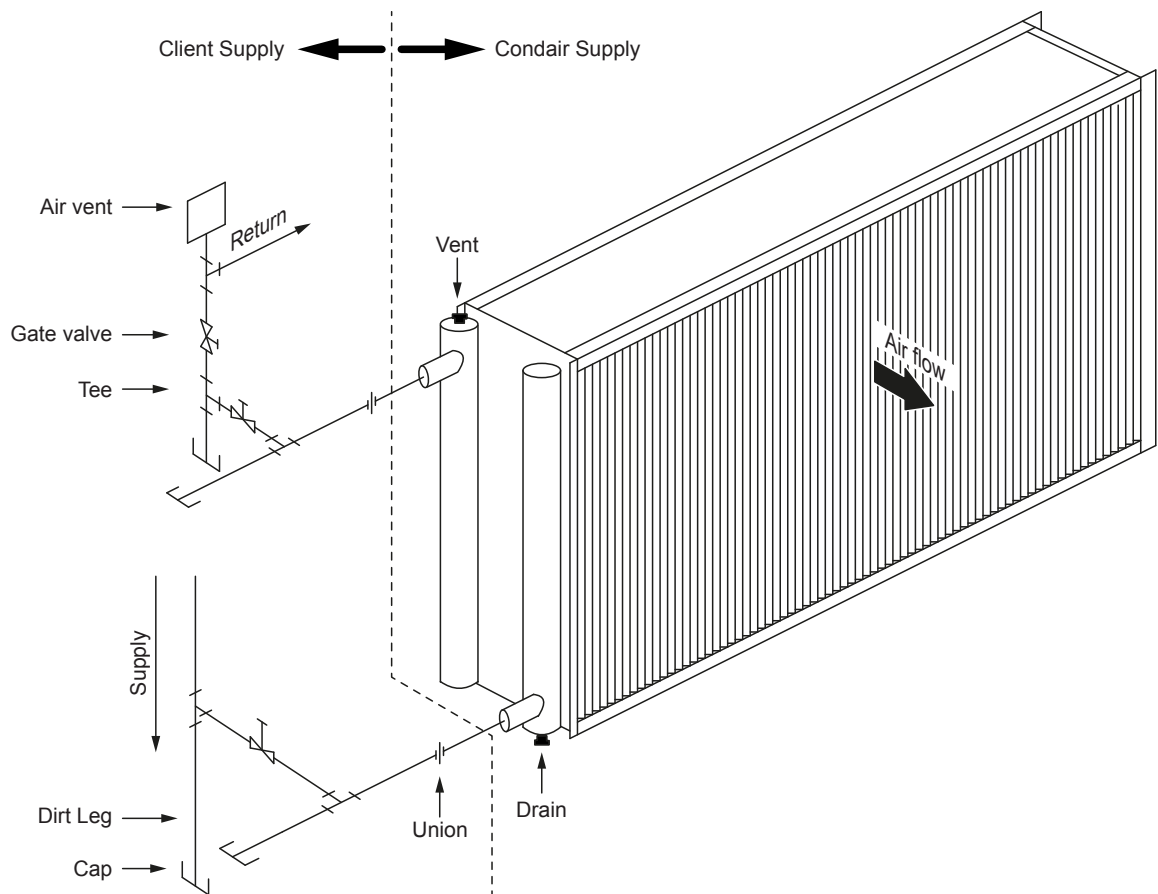


Fig. 18: Horizontal airflow piping diagram

15.7 Commissioning

Before supplying water to the cooling module, it should be checked for leaks:

1. Pressurize the cooling module to 100 PSIG with dry nitrogen. Leave the cooling module pressurized for a minimum of 10 minutes.
2. If the cooling module can maintain the pressure, the water connections can be considered leak-free.
3. If the pressure drops by 5 PSIG or more, re-pressurize the cooling module and wait another 10 minutes. If the pressure drops again, there are likely one or more small leaks that need to be located and repaired. Pressure losses greater than 5 PSIG would indicate a larger leak that should be isolated and repaired. If the coil itself is found to be leaking, contact, contact your Condair representative.

Note: All field brazing and welding should be performed using high-quality materials and an inert gas purge (like nitrogen) to reduce oxidation of the internal surface of the coil.

The cooling module is now ready for commissioning.

1. Open all air vents to eliminate air in the coil circuitry and headers.
2. Verify that all vents and drains are unobstructed and can discharge a stream of water.
3. Introduce water in the coil to ensure there is no obstruction in the vent and drain.
4. Fill the coil with water and then close all vents.
5. Perform an initial hydrostatic leak test of all brazed, threaded, or flanged joints, valves, and interconnecting piping. Recheck the coil level and apply the necessary corrections.
6. When the setup is found to be leak-free, discharge, and discard the initial water charge.
7. Prime the condensate trap with water to prevent airflow.
8. Flush the coil to clean the coil and pipework of all grease, oil, flux, and sealing compounds used during installation.

The cooling module is ready for operation.

15.8 Operation

Proper air distribution is vital to coil performance. Airflow anywhere on the coil face should not vary by more than 20%.

The pre-cooling module face velocity (air velocity across the face of the coil) must remain between 200 fpm and 394 fpm (1.0 - 2.0 m/s). The post-cooling module face velocity must remain between 200 fpm and 984 fpm (1.0 - 5.0 m/s). The water velocity must remain between 1 and 8 fps (0.3 – 2.4 m/s) (see [Table 12](#)).

The control of the cooling module is achieved using on-off, two port modulating, or three-way control valves. The customer is responsible for supplying any components required for the control of the cooling module. Please follow your controls manufacturer's recommendations and refer to the datasheet provided with the cooling module for recommended fluid flow rate and coil pressure drop.

Table 12: Fluid and air velocities

Fluid velocity (fps)		Air velocity (fpm)	
Water	1 - 8	Cooling (dry surface)	200 - 984
Glycol	1 - 6	Cooling (wet surface)	200 - 394

15.9 Maintenance

15.9.1 Important notes on maintenance

Qualification of personnel

All maintenance work must be performed only by well-qualified and trained personnel authorized by the owner. It is the owner's responsibility to verify the qualification of the personnel.

General note

Observe all safety precautions when performing maintenance tasks on the cooling module.

Follow these maintenance guidelines to maintain maximum coil performance and service life of the cooling module.

15.9.2 Maintenance list

1. Inspect the cooling coil periodically for signs of corrosion and/or leaks. Repair or replace the cooling coil if required.
Note: Repair and replacement of the coil and the connection of piping, valves, etc., should be performed as needed by a qualified technician.
2. Inspect the coil surface. Clean the coil surface if necessary. Should the coil surface need cleaning, follow the below cleaning recommendations:
 - a. Use caution when selecting the cleaning solution as well as the cleaning equipment. Improper selection of the cleaning solution can damage the coil and/or result in health hazards.
 - b. Clean the coil from the leaving air side so that foreign material will be washed out of the coil rather than pushed further in.
 - c. Be sure to carefully read and follow the manufacturer's recommendations before using any cleaning fluid.
4. Ensure the circulated fluid is free of sediment, corrosives, and biological contaminants. Periodic testing of the fluid is recommended, followed by any necessary corrective measures. Maintaining adequate fluid velocity and proper filtering of the fluid will help satisfy this requirement.
5. If automatic air vents are not utilized, periodic venting of the coil is required for removing the air accumulated in the tubes and maintaining proper coil performance.



DANGER!

Caution should be exercised to avoid injury. High pressure and/or high temperature fluids can cause serious personal injury.

15.9.3 Freeze Protection

If the chilled water cooling module is not required in winter, please ensure that it is drained and isolated. If the cooling module is used in winter and anytime freezing conditions are present, it must be protected. This can be accomplished by using one of the two protective methods described in the following sections: blowing-out coils and flushing coils. Follow the instructions detailed for each method in the corresponding section.

15.9.3.1 Blowing-out coils

1. Isolate the coil from the rest of the system by closing the valves on both the supply and return lines (see gate valves in [Fig. 18](#)).
2. Drain the coil by opening all drain valves and/or the drain plug. Remove the vent plug to aid the draining process.
3. Once the coil has been fully drained, the blower can be connected. Caps installed in the piping on straight runs going to the supply and return connections are ideal points to connect the blower. The air vent and drain plug are not suitable locations for connecting the blower.



DANGER!

Caution should be exercised when installing the blower. The blower operator must take precautions to ensure that water does not come into contact with any of the electrical components of the blower. Failure to do so may result in damage to the equipment and serious injury.

4. Close the vent or drain plug on the header that the blower is connected to, and open the drain valve or cap on the other header.
5. Operate the blower for 45 minutes and then check the coil to see if it is dry. A mirror placed in the discharge will become fogged if moisture is present. Repeat this procedure until the coil is dry.
6. Let the coil stand for several minutes, then blow it out again. If water comes out, repeat the blowing operation.
7. Leave all plugs out and drains open until the threat of freezing has passed.

15.9.3.2 Flushing coils

Condair recommends the use of inhibited glycol designed for HVAC applications for corrosion protection. The recovered fluid can then be used to flush other coils. Select an inhibited glycol solution that will protect the coil from the lowest temperatures that may occur at the coil locality. The following table is provided only as a guide on the freezing point of glycol solutions according to their concentration in glycol.

Table 13: Freeze point of glycol solutions as a function of glycol concentration

Concentration of ethylene glycol by volume (%)	Freezing point (°F) ¹⁾	Concentration of propylene glycol by volume (%)	Freezing point (°F) ¹⁾
0	32	0	32
10	25	10	26
20	16	20	19
30	3	30	8
40	-13	40	-7
50	-34	50	-28
60	-55	60	-60

¹⁾ The freezing point may vary from one product to another.

1. Isolate the coil from the rest of the system by closing the valves on both the supply and return lines (see gate valves in [Fig. 18](#)).
2. Drain the coil by opening all drain valves and/or the drain plug. Remove the vent plug to aid the draining process.
3. Close the drain valve(s) and drain plug.
4. Connect the flushing system to the coil. A typical system is shown in [Fig. 19](#).
5. With the throttling valve closed, start the pump, and operate until the air is vented from the coil. After venting is complete, close the air vent.
6. Open the throttling valve about halfway and circulate the fluid through the coil for 15 minutes. Verify the glycol solution strength. A hydrometer or test kit from the fluid manufacturer is suitable for this application.
7. Adjust the solution strength as needed and circulate the fluid for another 15 minutes.
8. Repeat steps 8 and 9 until the desired concentration is reached.
9. Shut down the pump and drain the inhibited glycol from the coil.
10. The recaptured fluid can be used to flush other coils, providing its concentration is maintained.

Note: Follow the manufacturer's recommendations before utilizing any glycol-based antifreeze solution. Additional fluid will be required for the pump, connected piping, and fluid reservoir.

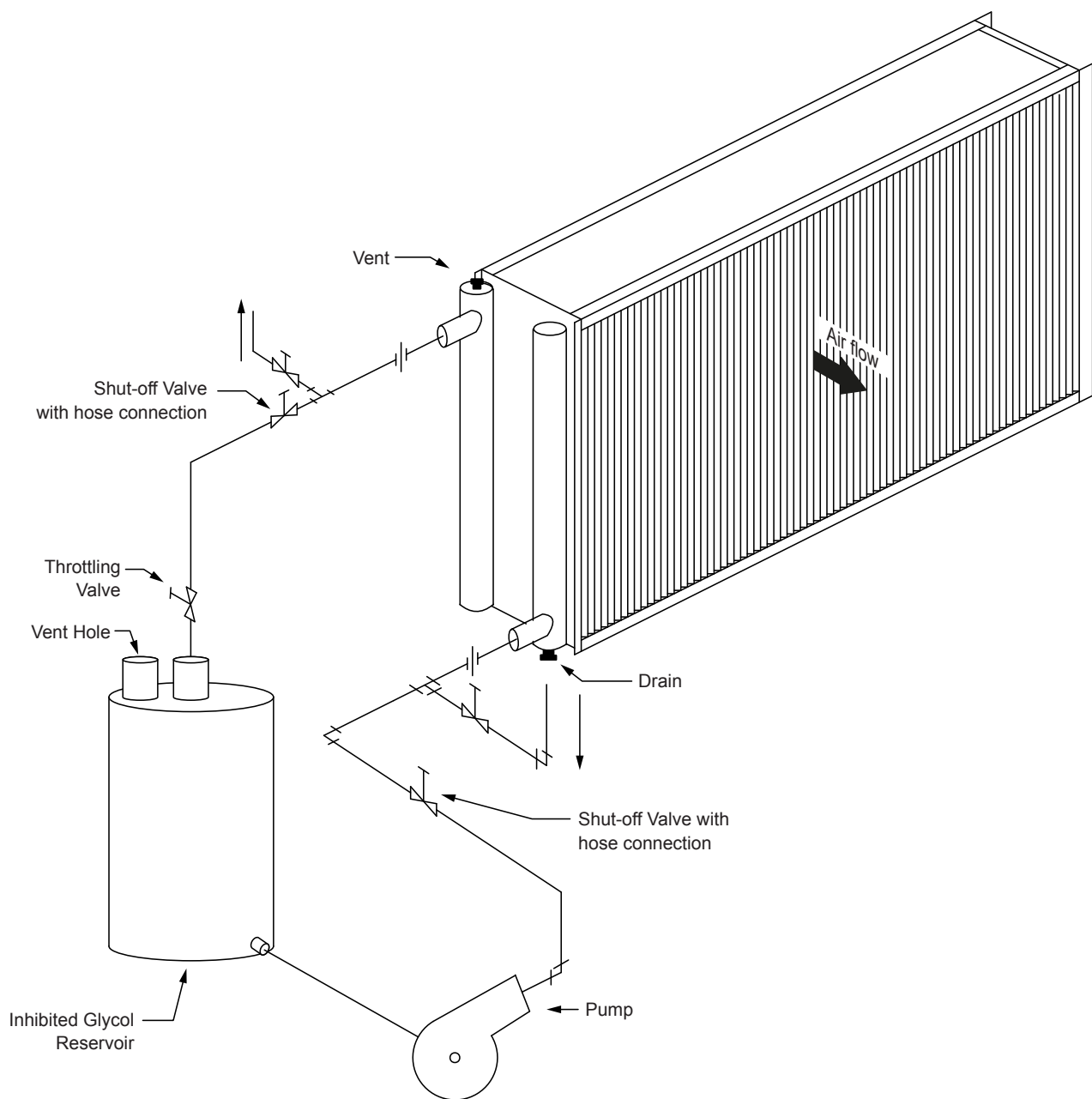


Fig. 19: Coil flushing system diagram

16 Appendix C: Additional instructions for the installation of Condair supplied transformers

16.1 Before you begin

The following additional instructions provide guidelines for the installation of Condair supplied transformers when paired with Condair DA Series desiccant dryers to ensure proper performance and longevity. Please refer to the transformer manufacturer's installation, operation, and maintenance guidelines. Observe and comply with all information and safety instructions contained in this section and, as well as all relevant documentation of components of the installed dehumidification system.

If you have any additional questions, please contact your Condair representative. They will be glad to assist you.

16.2 Notes on the additional instructions

16.2.1 Limitation

These additional instructions are restricted to the installation of Condair supplied transformers for the use with Condair DA desiccant dryers and is meant for well-trained personnel being sufficiently qualified for their respective work.

For detailed information on the installation, maintenance, and operation of the transformer please refer to the transformer manufacturer documentation.

16.2.2 General

Every person who is in charge of the installation and maintenance of the transformers must have read and understood these additional instructions before carrying out any work.

Knowing and understanding the contents of these additional instructions is a basic requirement for protecting personnel against any kind of danger, preventing faulty operation, and operating the equipment safely and correctly.

16.2.3 Qualification of personnel

Installation, operation, and maintenance of transformers should be performed by authorized personnel, trained, and qualified in the installation, repair, and maintenance of electrical equipment by authorization of the customer.

It is assumed that all persons working with the transformers are familiar and follow all requirements in NFPA 70E and CSA Z462 for safe work practice and personal protective equipment.

As with any electrical equipment, transformers must be installed, operated, and maintained according to the requirements of all applicable national and local electrical load.

16.2.4 Intended use of transformers

The transformers are intended exclusively for use with the corresponding Condair DA desiccant dryer for dehumidification process within specified operation conditions.

Any other type of application, without the written consent of Condair, is considered as not conforming with the intended purpose and may lead to hazardous operation of the transformer and will void any warranty.

Operation of the equipment in the intended manner requires that all the information contained in this installation manual and transformer manufacturers manual is observed (the safety instructions).

16.3 Receiving, Storage and Ventilation

16.3.1 Receiving & Inspection

Inspect the received shipment as follows:

- Inspect the shipping box for damage. Report any shipping box damage to the shipping company without delay.
- Check the received items against the packing slip to ensure that all items have been delivered. Report any shortages to Condair representative within 48 hours of receipt of the items. Condair does not accept responsibility for any material shortages beyond this period.
- Unpack the items and check for any damage. If items are damaged, notify the shipping company immediately.
- If the examination of the unit takes place outdoors, caution should be exercised to protect the unit against factors that may present further hazard.
- The standard delivery includes the transformer shipped on pallets which are to be removed at installation. Please note that Condair does not supply as part of the delivery of the transformer the connecting cables between transformer primary/secondary windings and electrical connector lugs. Please contact your Condair representative for the size of the winding and electrical lugs that will be required for your specific site operation.
- Verify the specification label of the product to ensure that it is suitable for your installation.

16.3.2 Storage

If the transformer will not be immediately installed and energized store the transformer in a clean dry environment away from any environmental airborne contaminants. Transformers should be stored in such a manner not to present any type of hazard.

The transformer should be stored in a heated building with uniform temperature and adequate air circulation to prevent condensation with the protective plastic wrap still installed for long term storage. If the transformer is not stored in the recommended heated building, the transformer must be protected from contaminants and moisture in non-heated buildings.

16.3.3 Ventilation

Effective ventilation is essential for transformer performance to meet their nameplate kVA capability. Please refer to the nameplate for the distance the transformer should be located from any wall or obstruction.

The minimum distance mentioned on the nameplate allows for free, clean circulation of air through the ventilation openings or around a non-ventilated unit. No other obstructions, line/load cables or ventilation blocking structures are allowed in the ventilation space.

16.4 Product Overview

16.4.1 General description

Condair DA Series desiccant dehumidifiers can be supplied with 600/480 step down transformer for Canadian customers that need a desiccant dehumidifier for a site with a 600V power source. These transformers are manufactured from quality non-aging, cold rolled, silicon steel lamination. The core is coated with prevent the ingress of moisture and are precision cut to close tolerances which eliminates burrs and improves performance. All core and coil assemblies are solidly grounded to the enclosure internally to ensure that all conductive metal parts have the same potential.

16.4.2 Functional description

A step-down transformer is designed to convert high-voltage electrical power from a 600V source to lower 480V output to use our DA Series desiccant dehumidifier. It is designed to achieve this transformation through primary and secondary windings around an iron core.

16.4.3 Transformer Sound Levels

Transformers must comply with NEMA standards for maximum sound levels permissible. The sound level on the transformer can vary from 40 to 67 dB which is considered loud, particularly when the transformers are close to proximity to office workstations.

It is important to select the transformer's location with care, especially in areas where noise sensitivity is a critical concern, such as hospitals, laboratories, and office facilities.

16.5 Technical Specification

16.5.1 Transformer technical specification

	PN 2606236	PN 2606238	PN 2606239
Rating	15kVA	30kVA	45kVA
Phase	3	3	3
Primary Voltage	600D	600D	600D
Primary Connection	Delta	Delta	Delta
Primary BIL	10kV	10kV	10kV
Primary FCAN (NPL)	2x2.5%	2x2.5%	2x2.5%
Primary FCBN (NPL)	4x2.5%	4x2.5%	4x2.5%
Primary Termination (NPL)	Mechanical Lugs	Mechanical Lugs	Mechanical Lugs
Secondary Voltage	480D	480D	480D
Secondary Connection	Delta	Delta	Delta
Secondary BIL	10kV	10kV	10kV
Secondary Termination (NPL)	Mechanical Lugs	Mechanical Lugs	Mechanical Lugs
Material	Aluminum	Aluminum	Aluminum
Frequency	60 Hz	60 Hz	60 Hz
Insulation Class	220°C	220°C	220°C
Temperature Rise	150°C	150°C	150°C
Sound Level	Meets NEMA ST-20 standards	Meets NEMA ST-20 standards	Meets NEMA ST-20 standards
Impedance (Std)	2.5% - 6.5%	2.5% - 6.5%	2.5% - 6.5%
Approval	CSA, UL	CSA, UL	CSA, UL
Seismic Compliance	OSHDP, IBC 2018 (Sds=2.0, z/h=1, Ip=1.5)	OSHDP, IBC 2018 (Sds=2.0, z/h=1, Ip=1.5)	OSHDP, IBC 2018 (Sds=2.0, z/h=1, Ip=1.5)
Enclosure Type	Heavy duty ventilated Type 3R standard / IP24	Heavy duty ventilated Type 3R standard / IP24	Heavy duty ventilated Type 3R standard / IP24
Enclosure Finish	ANSI 61 Grey, UL50	ANSI 61 Grey, UL50	ANSI 61 Grey, UL50
Enclosure Dimensions	21.88in/556mm (H), 21.5in/547mm (W), 20.12in/512mm (D)	28.75in/731mm (H), 25.75in/655mm (W), 23.8in/605mm (D)	28.75in/731mm (H), 25.75in/655mm (W), 23.8in/605mm (D)
Net Weight	180 lb	345 lb	380 lb
Conduit Entry	Side knock-out standards on all units;	Side knock-out standards on all units;	Side knock-out standards on all units;
Warranty	10 years.	10 years.	10 years.

Table 14: Transformer technical specification

16.5.2 Ampacity Rating for Transformer Wiring

For a three phase transformer: Use wires with an ampacity rating sufficient for the current values below.

Line Amperes = $\frac{\text{Volt Amperes}}{1.732 \times \text{Line Volts}}$

kVA	Current in Amperes	
	480V	600V
15	18	14.4
30	36.1	28.9
45	54.1	43.1

Fig. 20: Ampacity Rating for Transformer Wiring

16.6 Installation



DANGER!

Hazard of electric shock, explosion, or arch flash

When installing transformers, the installing contractor is responsible for the proper installation in accordance with the attached instructions in accordance with the local codes and guidelines. Failure to do so will result in serious personal injury or death and property damage.

16.6.1 Installation requirements

- Prior to assembly, installation, and operation of the transformer, we strongly recommend carefully reviewing the manufacturer's manual provided with the transformer.
- Install the transformer in a dry area where the ambient air is clean and can be cooled by means of free air circulation.
- Maintain proper clearance between the transformer and other structures. Avoid installing near corners and reflecting walls or ceiling. Refer to the transformer nameplate for clearance requirements.
- Cables or other flexible conduits should be considered to make incoming/ outgoing connections.

16.6.2 Installation procedure

Note: Please review the installation instructions (IOM) manual provided by the transformer manufacturer, shipped with the transformer. Prior to connecting the transformer to the Condair DA Series dehumidifier, please adhere to the energization, grounding guidelines outlined in the manual.

1. Install a circuit breaker on the output of the secondary connection.
2. Before connecting the secondary connection to the dehumidifier, inspect the primary and secondary connections are connected as per the wiring diagram illustrated in the nameplate of the transformer.
3. Inspect all the connections, ensuring there is no loose wire or exposed conductors. Using a multi-meter to check for proper voltage and continuity. The output on the secondary connection should be 480V.
4. Place the front access cover back on the transformer.
5. The breaker circuit on the output of the transformer can be connected to the dehumidifier.
6. Energize the unit and check the secondary voltage to ensure proper load is being supplied to the dehumidifier.

16.6.3 Sample Installation

Condair recommends the following installations. If you have additional questions, please contact your Condair representative. They will be glad to assist you.

Option 1

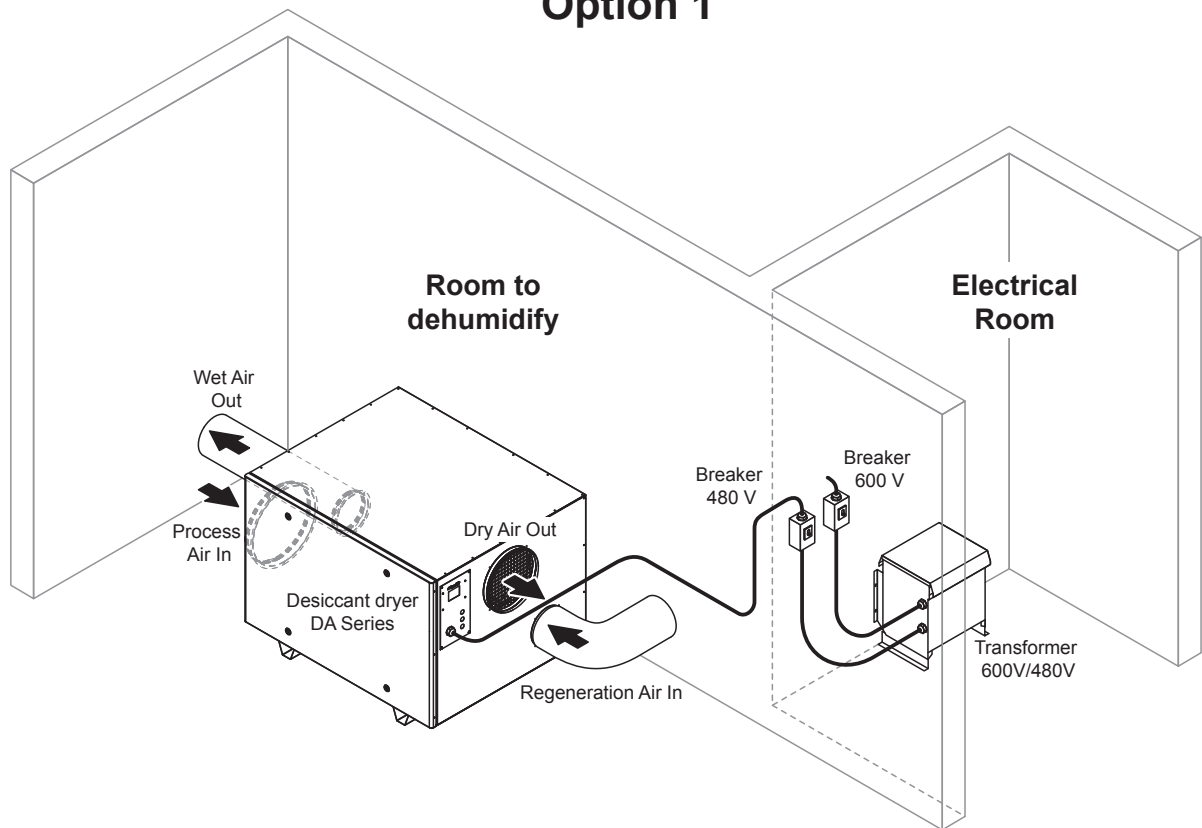


Fig. 21: Install transformer in the electrical room and DA Series Dehumidifier in the space to dehumidify.

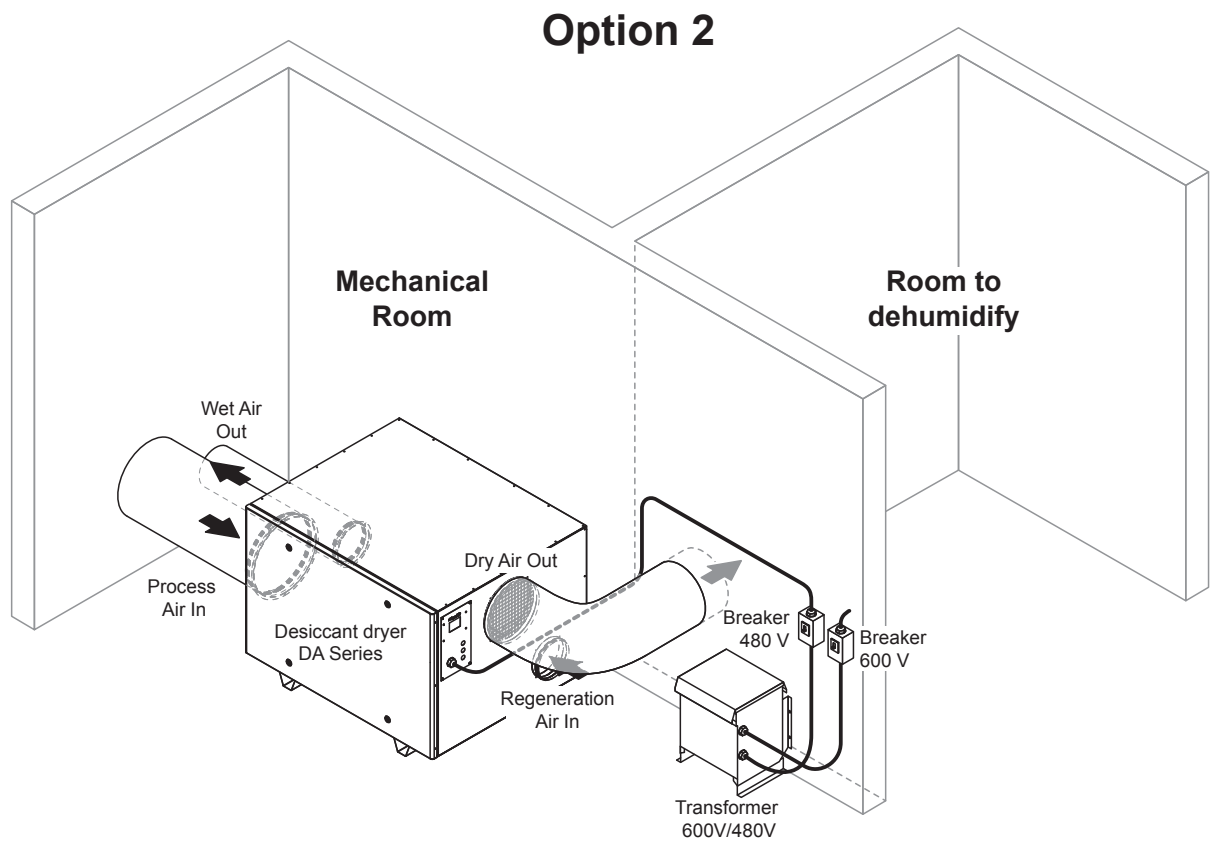


Fig. 22: Install both the DA Series Dehumidifier and Transformer in Mechanical Room

Note: Damper are not illustrated in the sketch above, however dampers are recommended when commissioning the unit for achieving the design airflow. Please refer to the IOM for additional information.

Note: For maintenance and operation instructions refer to the transformer manufactures IOM manual.

Notes

Warranty

Condair Inc. or Condair Ltd. (depending on the entity that supplied the product, and hereinafter collectively referred to as CONDAIR) warrant for a period of two years after installation or 30 months from the manufacturer's ship date, whichever date is earlier, that CONDAIR's manufactured and assembled products, not otherwise expressly warranted, are free from defects in materials and workmanship. Notwithstanding the foregoing, the products listed below have an alternate warranty period:

- GS/GSTC Series heat exchanger(s) are warranted to be free from defects in materials and workmanship for a period of 3 years from installation or 40 months from the manufacturer's ship date, whichever is earlier.
- SAM-e Short Absorption Manifolds, except for the coupling seals, are warranted to be free from defects in materials and workmanship for a total period of 10 years from the manufacturer's ship date.
- Humilife RH, RH2+ and WH humidifiers are warranted to be free from defects in materials and workmanship for a period of 5 years from the manufacturer's ship date. CONDAIR may, at its discretion, replace individual components or Humilife RH units as a whole.
- Spare Parts used for repairs are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer.
- No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

CONDAIR's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. CONDAIR's factory. The replacement parts are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer. Procedure:

1. Customer Requests Warranty as per instructions on the CONDAIR Warranty Form.
2. CONDAIR reviews the warranty claim and will respond in one of two ways:
 - a. Warranty Accepted – Replacement Part or credit granted.
 - b. Warranty Declined – Response with justification will be provided to the customer.
3. In some cases, CONDAIR may request the part to be returned, freight prepaid by the customer, as part of the warranty acceptance or warranty determination process. Some reasons include:
 - a. Part must be analyzed to determine the root cause of failure.
 - b. Part must be returned to the supplier for claim/investigation.

When parts are requested to be returned, replacement parts will be sent by CONDAIR to the customer against an invoice from CONDAIR paid by the customer. The cost of the replacement parts will be reimbursed to the customer with a credit note after the parts are received and analyzed by CONDAIR, if the warranty is accepted.

The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to CONDAIR until said products have been paid for in full and then said liability shall be limited to the original purchase price for the product. Any further warranty, with the exception of a purchased extended warranty described below, must be in writing, and signed by an officer of CONDAIR.

CONDAIR makes no warranty and assumes no liability unless the equipment is installed in strict accordance with the installation manual in effect at the date of purchase, and by properly qualified and licensed professionals capable of installing such equipment.

CONDAIR makes no warranty and assumes no liability whatsoever for consequential damage or damage resulting directly from misapplication, incorrect sizing, or lack of proper maintenance of the equipment.

CONDAIR makes no warranty and assumes no liability whatsoever for damage to the products, humidifier, supply lines, drain lines, steam distribution systems, or the building as a whole caused by freezing.

CONDAIR reserves the right to change the design, specifications, and performance criteria of its products without notice or obligation.

Extended Warranty

Extended warranties are available to purchase under the conditions listed above. Extended warranties must be purchased at the time of the original equipment order.



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