



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

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Blower Pack
Condair **BP II**

Thank you for choosing Condair

Installation date (MM/DD/YYYY):

Commissioning date (MM/DD/YYYY):

Site:

Model:

Serial number:

Contact

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1 Introduction

1.1 Before You Start!

Thank you for purchasing the Condair Blower Pack.

Condair humidifiers and blower packs incorporate the latest technical advances and meet all recognized safety standards. Never-the-less, improper use of the Condair equipment may result in danger to the user or third parties, and/or damage to property.

To ensure safe, proper and economical operation of the Condair humidifier and blower pack, please observe and comply with all information and safety instructions contained in this manual as well as all the relevant documentation of components of the installed humidification system.

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

1.2 General

Limitations

The subject of this manual is the Condair Blower Pack. The various options and accessories may only be described in-so-far as is necessary for proper installation, operation and maintenance of the equipment. Additional information on available options and accessories can be obtained in the respective instructions that are supplied with them.

This manual is restricted to the installation, operation and maintenance of the Condair Blower Pack and is intended for well trained personnel who are suitably qualified for their respective tasks.

Symbols Used in This Manual



CAUTION!

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



WARNING!

The catchword "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 catchword "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.

Storage of Manual

Keep this manual in a place where it is safe and readily accessible. If the equipment is moved to another location, ensure that the manual is passed on to the new user/operator.

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

2 For Your Safety

General

Every person who is tasked with the installation, maintenance or operation of the Condair humidifier and blower pack must read and understand this manual and the humidifier manuals before performing any work. Knowing and understanding the contents of this manual 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 marking applied to the humidifier and blower pack must be observed and kept in a readable state.

Personnel Qualifications

All procedures described in this manual must only be performed by personnel who are adequately qualified, 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.

All personnel working with the humidifier and blower pack must be familiar with, and comply with the appropriate regulations on workplace safety and prevention of accidents.

Intended Use

The Condair Blower Pack is intended exclusively for air humidification within the specified operating conditions (refer to "[Operating Data](#)" on page 43). 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.

Dangers that may arise from the Condair humidifier and blower pack:



DANGER!
Risk of electric shock!

The humidifier and blower packs are mains powered. Live parts may be exposed when the door panels/covers are removed. Touching live parts may cause severe injury or even death.

Prevention: The Condair humidifier and blower pack must be connected to the mains only after all installation work has been completed, checked for correct workmanship, and the door panels/covers are installed and fastened properly. The units must also be disconnected from the mains whenever work must be performed on them.

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

The Condair humidifier and blower pack use hot steam vapors for humidification. Bare skin exposed to hot steam vapours can result in severe burns.

Prevention: Wear appropriate personal protective equipment when working near steam vapours.

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

Components of the steam system (including the steam cylinder, steam distributors, etc.) get up to 212 °F (100 °C) during operation. Contact with the hot surfaces can result in severe burns.

Prevention: Shut down the humidifier and allow it to cool down before performing any work on the steam system.

Preventing Unsafe Operation

All personnel working with the Condair humidifier and blower pack must immediately report to the customer any alterations to the unit that may affect safety, and **secure the units against accidental power-up**.

Modifications to the Unit Prohibited

Modifications are NOT permitted on the Condair humidifier and blower pack without the express written consent of Condair.

3 Receiving and Storage

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 assume 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 [Figure 2 on page 11](#).

3.2 Storage and Transportation

Storage

Store the Condair Blower Pack 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: 41 to 104 °F (5 to 40 °C)
- Room humidity: 5 to 75% RH

Transportation

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

Packaging

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

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

4 Product Overview

4.1 General Description

The Condair Blower Pack is used along with an atmospheric steam generating humidifier to distribute steam directly into local areas or into structures that do not have a built-in air distribution system.

With the RS series humidifiers, the blower pack can be mounted directly on the humidifier or separately from the humidifier. Multiple blower packs for large humidifiers with two steam cylinders can also be installed remotely. Refer to [Figure 1](#).

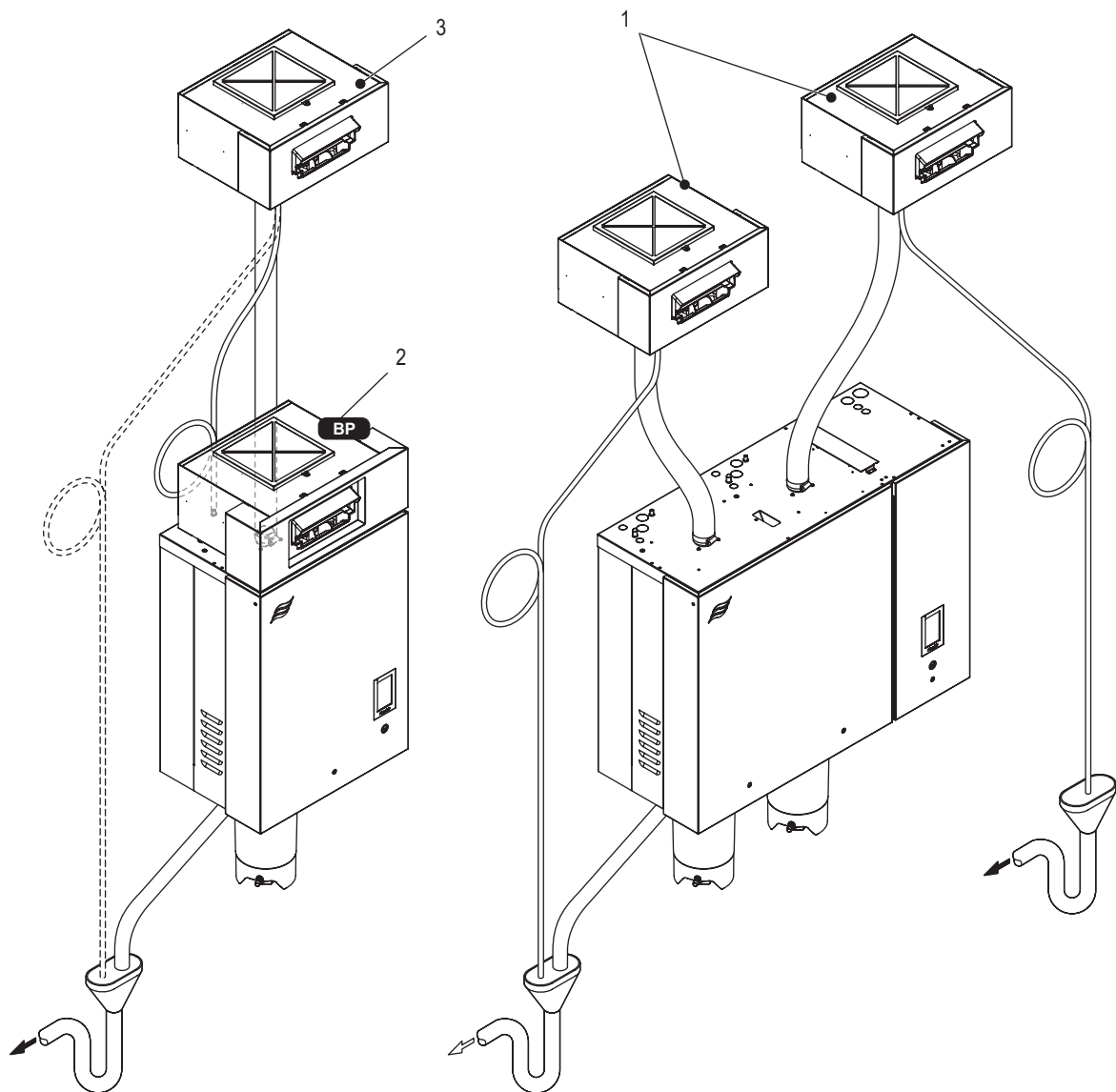


Figure 1: Condair Blower Pack Mounting Configurations

- 1 Remote-mounted multiple blower packs (on large humidifiers)
- 2 Direct-mounted blower pack
- 3 Remote-mounted blower pack

4.2 Identification of the Unit

The specification label on the side of the blower pack shows its model type, serial number and other ratings. Refer to [Figure 2](#).

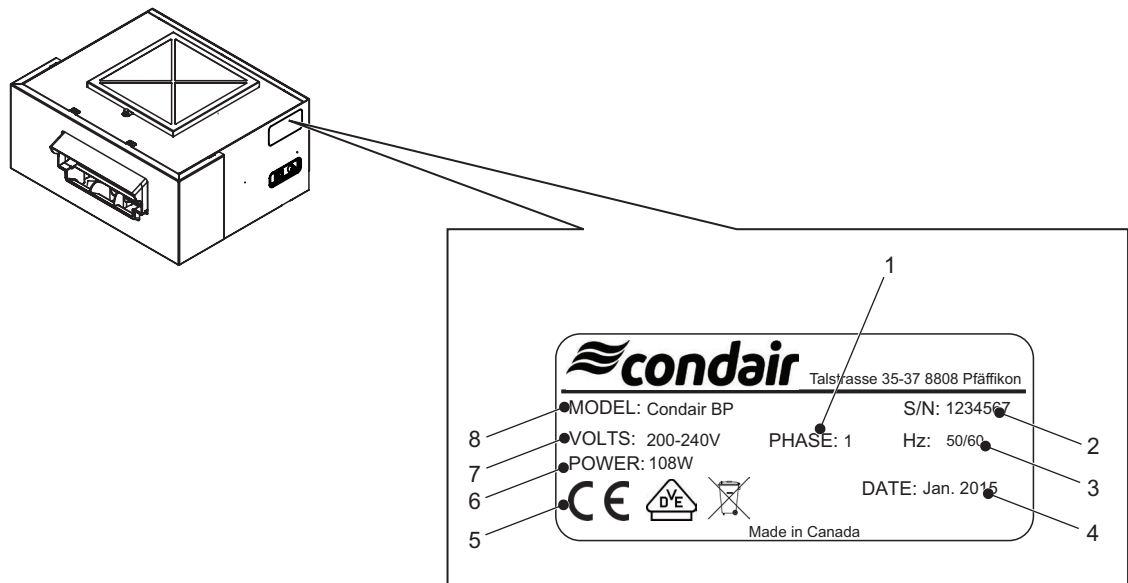


Figure 2: Condair Blower Pack Specification label

- 1 Current phase
- 2 Serial number (7-digit)
- 3 Frequency rating
- 4 Year/month of manufacture

- 5 Maximum current
- 6 Power consumption
- 7 Voltage rating
- 8 Model type

4.3 Options and Accessories

The air filter assembly (P/N 2579375) is the only available option for the Condair Blower Pack. To order it, please contact your Condair representative. There are no accessories for the Condair Blower Pack.

4.4 Functional Description

The blower pack consists of an electrically-driven fan, an optional air filter assembly, a distributor assembly, a steam inlet, a thermostat assembly, a safety relay, fuse and a high/low speed switch. The fan is controlled by the thermostat assembly and the high/low speed switch. Refer to [Figure 3 on page 13](#).

When the blower pack is powered on, the safety relay closes and permits the humidifier to generate steam when it receives a demand signal. The generated steam enters the blower pack through the steam adaptor into the distributor assembly. A normally-open contact in the thermostat assembly closes when the temperature reaches approximately 140 °F (60 °C), at which time the fan starts. Air drawn through the grill in the cover assembly then mixes with the steam and is dispersed into the room/facility through the distributor assembly.

The high/low speed switch controls the speed of the fan, which is set to the specific humidification requirements of the room/facility. Once set, the switch setting should not be altered.

When the steam supply stops, the fan continues to run until the contact in the thermostat assembly opens as its temperature drops down to approximately 122 °F (50 °C).

A security loop cable attached to the back of the blower pack prevents the humidifier from starting if the safety interlock is disabled. A warning message "Blower pack not connected" is displayed on the humidifier.

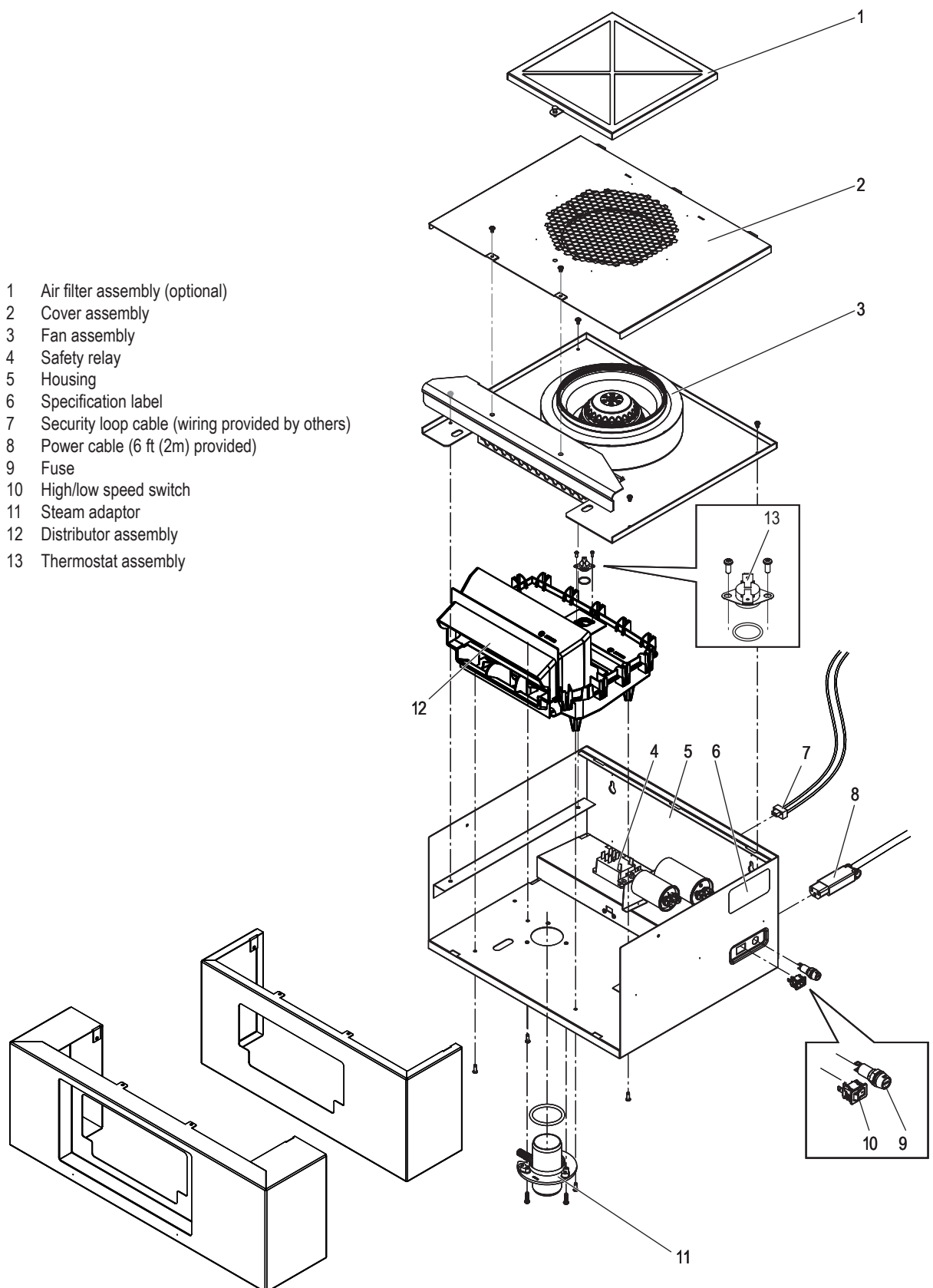


Figure 3: Condair Blower Pack Components

5 Installation

5.1 General

Strictly observe and perform all installation tasks including the mounting of the unit and connection of the water, steam and power supplies as described in this manual.

Observe and comply with all local and national codes dealing with water, steam and electrical installations.

Condair does not accept any liability for installation of humidification equipment by unqualified personnel, or the use of equipment/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

Some installation work requires removal of the door panels/covers on the blower pack and humidifier. Please note the following:



DANGER!
Risk of electric shock!

The humidifier and blower pack are mains powered. Live parts may be exposed when the door panels/covers are removed. Touching live parts may cause severe injury or even death.

Prevention: The Condair humidifier and blower pack must be connected to the mains only after all installation work has been completed, checked for correct workmanship, and the door panels/covers are installed and fastened securely.



CAUTION!
Electrostatic discharge (ESD)!

The electronic components inside the humidifier are sensitive to electrostatic discharge (ESD).

Prevention: Take appropriate measures to protect the electronic components inside the unit against damage caused by electrostatic discharge (ESD). Refer to ANSI/ESD-S20.20.

5.2 Installation Overview

The multi-platform Condair blower pack can be installed remotely with any Condair RS humidifier, or mounted directly onto the Condair RS RS 010-090 humidifiers. Multiple blower packs can also be used remotely with large humidifiers equipped with two steam cylinders. [Figure 4](#) shows typical mounting configurations of the blower pack(s) and humidifier.

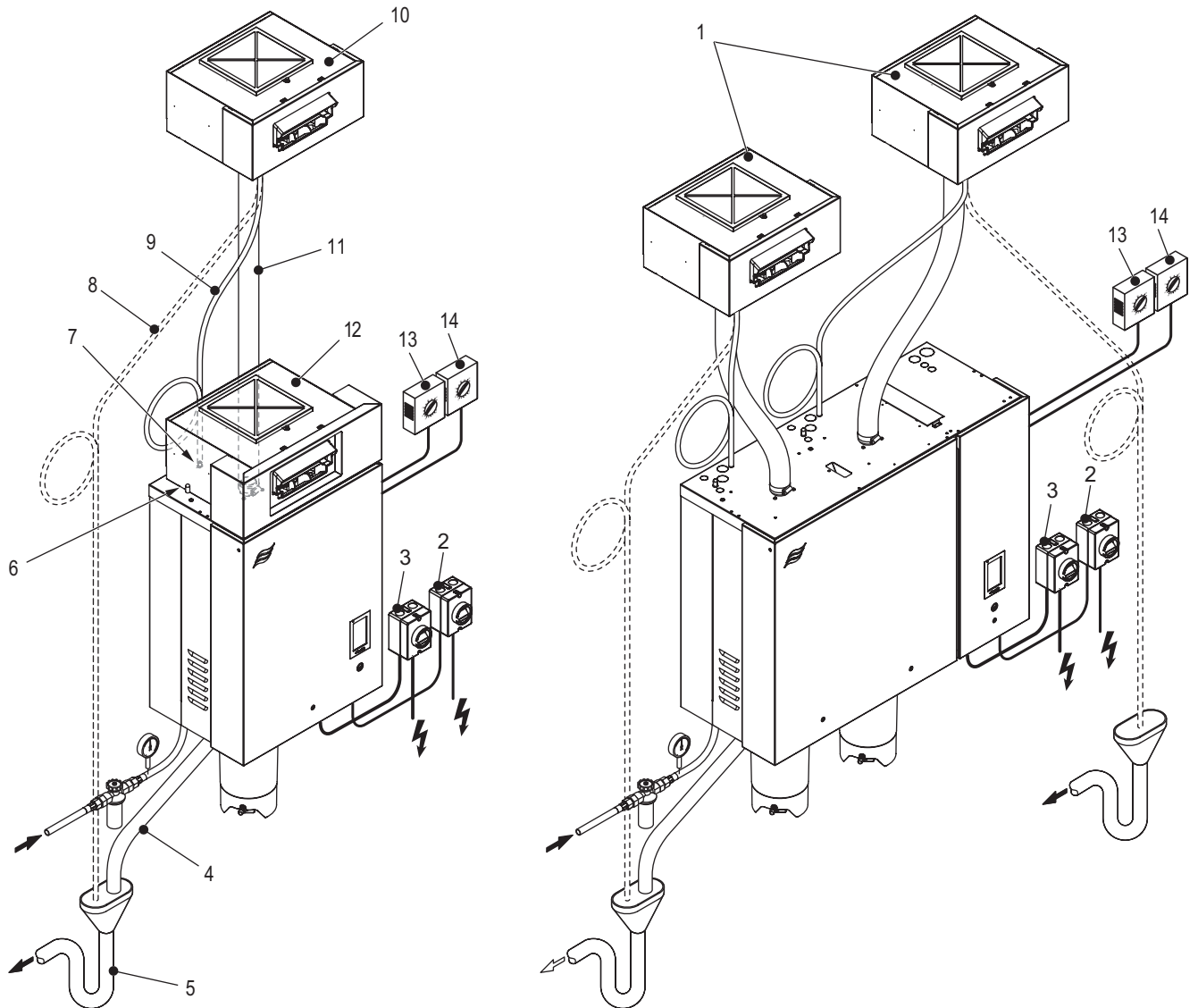


Figure 4: Typical Installation of Condair blower pack with Condair RS Humidifier

- | | | | |
|---|---|----|--|
| 1 | Blower packs (multiple, remote-mounted with large humidifier) | 9 | Blower pack (single, remote-mounted) |
| 2 | Electrical disconnect switch - heating voltage supply | 10 | Steam line (see Note 4 below) |
| 3 | Drain line (see Note 1 below) | 11 | Blower pack (single, direct-mounted) |
| 4 | Air gap funnel and trap (see Note 2 below) | 12 | High limit humidistat (external security loop) |
| 5 | Condensate drain connection to cylinder (for remote unit) | 13 | Humidity sensor or controller |
| 6 | Condensate drain connection to drain (for remote unit) | | |
| 7 | Condensate drain line (alternate, to floor drain) | | |
| 8 | Condensate drain line (see Note 3 below) | | |

Note 1: The drain line should have a minimum internal diameter of 1-1/4 in (30 mm), with a constant downslope (minimum 1.2°) to the air gap funnel, and must not touch the sides or bottom of the funnel. Use stainless steel or plastic pipe if using DI or RO water.

Note 2: The air gap funnel and trap should be located away from the control cabinet in the humidifier to prevent any rising steam from damaging the electrical components in the cabinet.

Note 3: Condensate drain line should have a constant downslope (minimum 1.2°), with no restrictions. It must have a trap with a height of 3.94 in (100 mm). The trap should be located a minimum of 12 in (300 mm) below the blower pack /steam line. Also see note below.

Note 4: The steam line should be as short as possible – the maximum length varies depending on the humidifier capacity and material used (refer to [Table 2 on page 21](#)). The steam line must have a constant slope (minimum upslope of 10° or minimum downslope of 2°), and have no restrictions in the line. Steam lines must not merge except at the lower pack (and only through a Condair breakout adaptor). A condensate line must also be installed just before the restriction. On long steam line runs, condensate lines must be installed every 15 ft (4.5 m), and at the lowest point in the steam line. The condensate lines must connect into full-size "Tee" connectors.

The direct-mounted blower pack is factory-ready to run just as soon as the Condair RS humidifier is installed and configured.

To install a remote-mounted blower pack refer to ["Remote-Mounted Installation for Blower Packs" on page 26](#).

5.3 Site Requirements

In preparation for installation of the Condair Blower Pack, the following site requirements must be satisfied. Report any discrepancies to the site engineer.

Steam and Condensate Lines

- ☐ The selected location for installation of the blower pack should allow proper routing of the steam and condensate lines as described in ["Best Practices for Steam and Condensate Line Installation" on page 19](#).
- ☐ The length of the steam line should be kept as short as possible (refer to [Table 2 on page 21](#)) to minimize heat loss through the steam line.

Mounting

- ☐ The selected location for the humidifier and blower pack should meet the requirements described in ["Location and Clearances" on page 17](#).
- ☐ The blower pack is designed for wall-mounting in protected interiors. The surface (wall, pillar, etc.) to which the blower pack and humidifier are to be mounted must offer a sufficiently high load-bearing capacity, and be suitable for the installation. Refer to ["Size and Weight" on page 43](#).
- ☐ The blower pack must only be installed and operated in a drip-proof location within buildings, where the permissible ambient temperature and humidity conditions are maintained. Refer to ["Operating Data" on page 43](#) for details.
- ☐ The blower pack should not be mounted on hot or very cold surfaces, or near vibrating components, or on the floor.
- ☐ The blower pack should not be used as a ducted blower. The air volume from the blower pack is not sufficient for proper operation in a ducted system.

Power Supply

- ☐ The available voltage and phase of the power supply should match the requirements for the blower pack, as indicated on the specification label. Refer to [Figure 2 on page 11](#).

5.3.1 Location and Clearances

The installation of the blower pack depends largely on the location of the humidifier as well as clearances required to ensure steam does not come in contact with any surfaces before it is absorbed into the air. Refer to [Figure 5 on page 17](#) and [Table 1 on page 18](#) for blower pack minimum clearance requirements.

The clearance dimensions shown are for reference only, and are the minimums required for the proper functioning of the equipment. Consult local and national installation codes. Condaire does not accept responsibility for violations of installation codes.

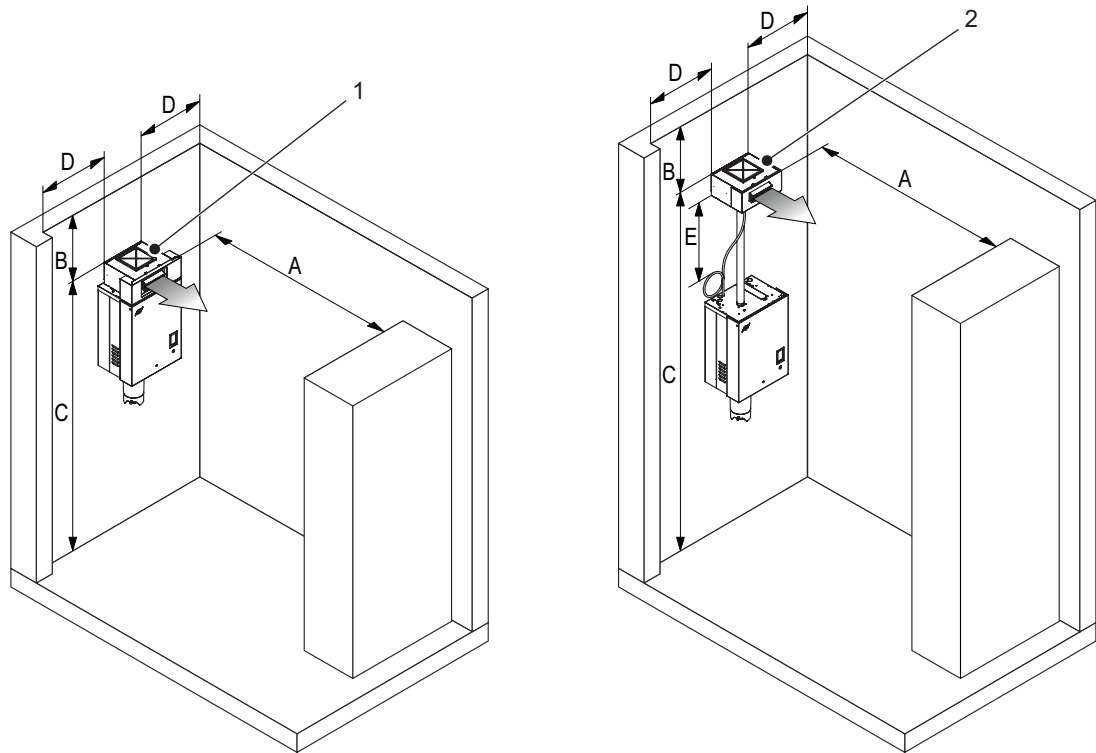


Figure 5: Blower Pack Clearance Requirements

- 1 Direct-mounted blower pack
- 2 Remote-mounted blower pack

Table 1: Minimum Clearances

Capacity	Condair Blower Pack						
	5 lb/h (2.2 kg/h)	10 lb/h (4.5 kg/h)	20 lb/h (9 kg/h)	30 lb/h (13.6 kg/h)	50 lb/h (22.7 kg/h)	75 lb/h (34 kg/h)	100 lb/h (45 kg/h)
Low Speed							
Dimension "A" (minimum), Low speed	9 in (0.23 m)	18 in (0.46 m)	75 in (1.91 m)	86 in (2.19 m)	174 in (4.42 m)	189 in (4.81 m)	248 in (6.30 m)
Dimension "B" (minimum), Low speed	12 in (0.31 m)					48 in (1.22 m)	84 in (2.14 m)
High Speed							
Dimension "A" (minimum), High speed	6 in (0.16 m)		60 in (1.53 m)	71 in (1.81 m)	132 in (3.36 m)	153 in (3.89 m)	218 in (5.54 m)
Dimension "B" (minimum), High speed	12 in (0.31 m)						
Dimension "C" (approximate)	90 in (2.3 m)						
Dimension "D" (approximate)	12 in (0.31 m)					30 in (0.77 m)	
Dimension "E" (minimum)	39.5 in (1.0 m)						
Dimension "E" (maximum)	158 in – Condair recommends 79 in (4.0 m – Condair recommends 2.0 m)						

Notes:

The values in [Table 1](#) are based on the following nominal conditions: 72 °F (22 °C), 40% RH.

The Condair blower pack should not be installed near cold surfaces or where dew point may be reached.

Higher humidity or lower room temperature may require increased clearances.

5.4 Best Practices for Steam and Condensate Line Installation

Before proceeding with installation, Condair recommends that you familiarize yourself with the best practices for installing atmospheric steam lines and condensate lines described below. Refer to [Figure 6 on page 23](#).

Steam Lines

- Use rigid steam pipes made of copper or stainless steel (minimum DIN 1.4301) exclusively, and use steam hoses for short distances only. Refer to [Table 2 on page 21](#) for details. Use original steam and condensate hoses from your Condair representative. Steam and condensate lines made of any other materials may adversely affect the operation of the unit, and will void the warranty.



WARNING!

Excessive backpressure can result in serious injury or damage to equipment!

Excessive backpressure in the steam line may affect the proper functioning of the humidifier, and may also cause unexpected release of hot steam vapors. Bare skin exposed to the hot steam vapors can result in severe burns.

Prevention: Minimize the length of the steam line and the number of bends, as the backpressure can rise approximately 0.12 in H₂O for every foot (100 Pa for every meter) of steam line, and every 90° elbow.

- The length of the steam line should be kept as short as possible. It should not exceed the maximum equivalent length shown in [Table 2 on page 21](#). Exceeding the maximum length can affect performance of the unit and may void the warranty.
- **Note:** With oversized steam lines the maximum length can be extended. Use a Condair steam hose for short distances only.

IMPORTANT! When determining the length and routing of steam lines, allowances must be made for thermal expansion. If a steam hose is used, allowances must be made for shrinkage in the length of the hose due to aging.

- The inside diameter of the steam line must match the diameter of the steam adaptor on the humidifier.
- Use long radius elbows for steam pipes – the minimum bend radius is 5× the internal diameter. Steam hoses should have a minimum bend radius of 12 in (300 mm).
- Do not decrease the diameter of the steam line, as it increases the backpressure in the line and condensation of the steam. If necessary, increase the diameter of the steam line on the downslope, and install a condensate line at the lowest point. Once expanded, a reduction in diameter is not permitted except at the blower pack. Install a Condair steam line reducer at the connection to the blower pack, and install a condensate line just before the restriction. Contact your Condair representative for details of the reducer.
- If using blower pack with large humidifiers (with dual steam cylinders), do not connect the output from both steam cylinder to a single blower pack. Each blower pack has a maximum capacity of 100 lb/h (45 kg/h).
- The steam line from the humidifier must lead straight upwards for a minimum of 12 in (300 mm) before continuing to the blower pack. The steam line must have a constant slope (minimum upslope of 10° or minimum downslope of 2°), and have no restrictions in the line.
- Rigid steam pipes can be connected to the blower pack and the humidifier by means of short lengths of steam hoses and secured with hose clamps. If using a steam hose, it must be secured to the blower pack and the humidifier steam outlet with hose clamps.

**CAUTION!**

Do not over-tighten the hose clamp. The maximum torque for 1-3/4 in (45 mm) gear clamps is 16 in·lbs (180 N·cm).

- To minimize formation of condensation and maximize efficiency, steam lines made of rigid pipes (copper or stainless steel) must be insulated with a minimum of 1 in (25 mm) of pipe insulation over its entire length.
- The weight of the steam line must be supported so there is no load on the humidifier.

**WARNING!****Risk of severe burns from contact with hot steam vapours!**

Restrictions in the cross-section of the steam line will cause excessive backpressure in the steam cylinder when the unit is operating, which may cause unexpected release of hot steam vapors. Bare skin exposed to the hot steam vapours can result in severe burns.

Prevention: Observe the following:

- Upon completion of the installation, purge the steam line to remove any contaminants and installation materials.
- If using a steam hose make sure there are no kinks in the hose. A heated hose is more likely to kink.
- To prevent condensate pockets, the steam line must not sag. If necessary, support the steam line with pipe clamps, trough, or wall brackets, and install a condensate drain at the lowest point in the steam line.
- Do not install a shutoff valve (e.g. a manually operated shutoff valve, solenoid valve, etc.) in the steam line.

Table 2: Steam Line Recommendations

Condair Model	Steam Line			Over-sized Steam Line**			Steam Losses based on 1" (25mm) insulated copper pipe
	Maximum Length	MED-L Copper Tube Diameter	Stainless Steel Tube Diameter	Maximum Length	MED-L Copper Tube Diameter	Stainless Steel Tube Diameter	
RS 010***	24 ft (7.3 m)	1-1/2 in (40 mm)	1-3/4 in × 0.065 wall (45 mm × 1.65 mm wall)	§	2 in (50 mm)	2 in × 0.065 wall (50 mm × 1.65 mm wall)	0.11 lb/h/ft (0.18 kg/h/m)
RS 015***	25 ft (7.6 m)			§			
RS 020***	27 ft (8.2 m)			§			
RS 030***	30 ft (9.1 m)			§			
RS 045	35 ft (10.7 m)			86 ft (26 m)			
RS 065	45 ft (13.7 m)			94 ft (28 m)			
RS 090*	50 ft (15.2 m)	x2	x2	100 ft (30 m)	x2	x2	
RS 130*		1-1/2 in (40 mm)	1-3/4 in × 0.065 wall	2 in (50 mm)	2 in × 0.065 wall		
RS 180*			(45 mm × 1.65 mm wall)		(50 mm × 1.65 mm wall)		
RS all models RS 90* RS 130* RS 180*	10 ft (3 m)	Steam Hose P/N 1328820 – 1-3/4 in (45 mm)					0.15 lb/h/ft (0.22 kg/h/m)

Notes:

- * Use a single steam line for each steam cylinder. Do not combine lines except at a distributor, and only if using the humidifiers in parallel.
- ** The over-sized lines may require a reducer at the humidifier and the blower pack.
- *** These models will require a reducer at the blower pack.
- § Please consult factory.

Condensate Lines

- Use a 3/8 in (9.5 mm) condensate hose, or 3/8 in (9.5 mm) stainless steel pipe or 1/4 in (6.5 mm) copper pipe for condensate lines and traps.



WARNING!

Risk of severe burns from contact with hot fluids or steam!

The condensate lines may be filled with hot fluids or steam. Bare skin in contact with hot fluids or steam can result in severe burns.

Prevention: Never plumb the condensate lines to empty into a sink used by personnel. Always connect the lines to a drain according to applicable national and local plumbing codes.

- The condensate drain line from the blower pack must have a constant minimum downslope of 1.2°, with a trap height of 3.94 in (100 mm). It may be connected to the fill cup port on the top of the humidifier or to the building floor drain with condensate cooler, as required. The condensate trap must be at least 12 in (300 mm) below the condensate port on the blower pack.
- Condensate lines must also be installed at all low points, and at horizontal-to-vertical transitions in the steam line. The condensate drain lines should always connect to full-size "Tee" connectors in the steam line and have a minimum downslope of 1.2°. Install full-size "Tee" connectors for condensate drain lines at all horizontal-to-vertical transitions. The condensate trap must be at least 12 in (300 mm) below the "Tee" connectors.
- For a steam line that is longer than 15 ft (4.5 m) up to the maximum recommended length, install condensate lines and traps at regular intervals. The maximum distance between the condensate lines is 15 ft (4.5 m).
- Make sure that the condensate lines allow proper flow.
- Do not over-tighten the hose clamps on the condensate lines.

IMPORTANT! Before starting up the humidifier, prime the condensate traps with water.

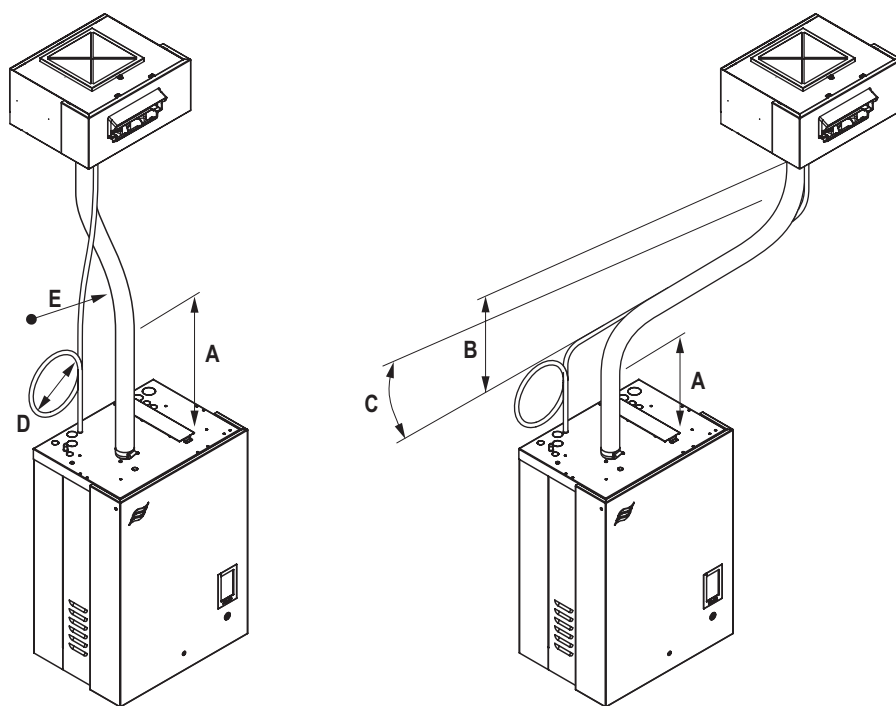


Figure 6: Permissible Minimums for Steam and Condensate Lines

- A Steam line must run minimum 12 in (300 mm) vertically before continuing to the blower pack.
- B The condensate trap must be minimum 12 in (300 mm) below the condensate outlet on the blower pack. The condensate line must have a constant minimum downslope of 1.2°.
- C The steam line must have a constant minimum upslope of 10°, or constant minimum downslope of 2°.
- D All condensate traps must have a height of 3.94 in (100 mm).
- E If using a steam hose, the minimum bend radius is 12 in (300 mm). For rigid steam pipes use long radius elbows – minimum bend radius is 5× the internal diameter. The steam line/hose must not exceed the length specified in [Table 2 on page 21](#).

5.4.1 Common Steam and Condensate Line Installation Mistakes

Some common steam and condensate line installation mistakes are shown in [Figure 7](#).

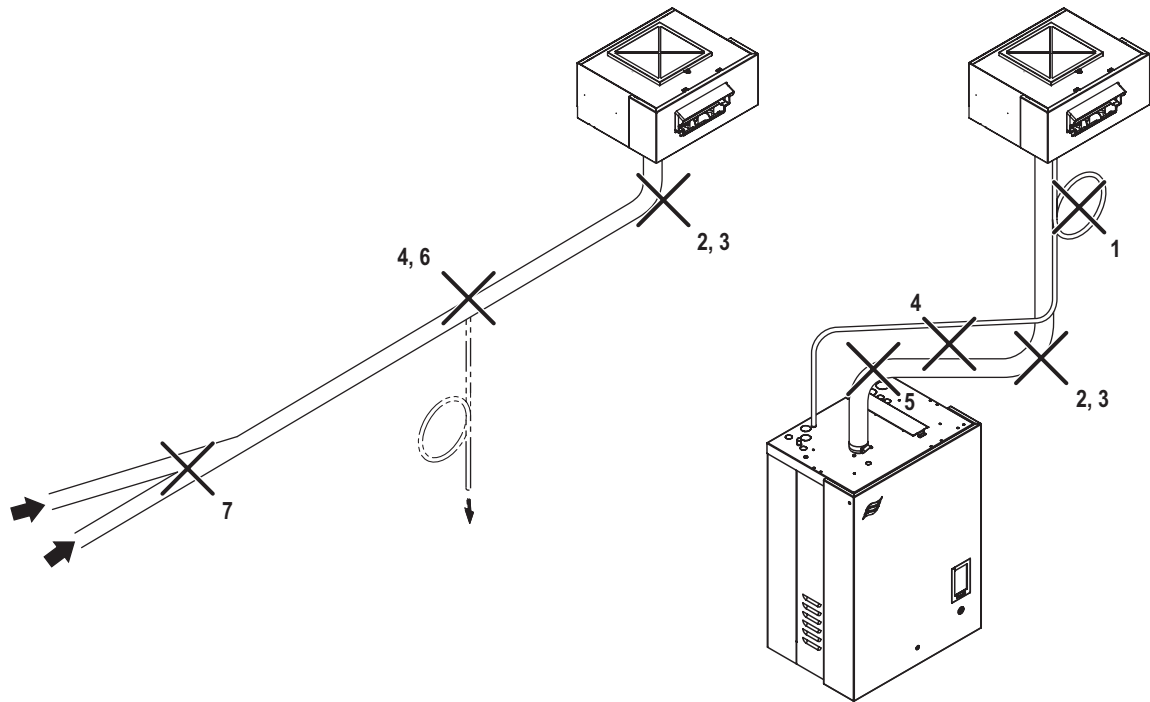


Figure 7: Common Steam and Condensate Line Installation Mistakes

- 1 The condensate trap is located less than the required minimum 12 in (300 mm) below the blower pack condensate outlet.
- 2 The minimum bend radius of 12 in (300 mm) for the steam hose (or 5× the internal diameter for rigid pipes) is not maintained.
- 3 No condensate trap is installed at the horizontal-to-vertical transition.
- 4 The required slope (constant minimum upslope of 10°, or constant minimum downslope of 2°) for steam line and (constant minimum downslope of 1.2°) for condensate line is not maintained.
- 5 The steam line does not run straight up for the required minimum 12 in (300 mm) before continuing to the blower pack.
- 6 On long steam line runs, condensate lines are required every 15 ft (4.5 m), and must connect into full-size "Tee" connectors in the steam line. The condensate trap must be installed a minimum of 12 in (300 mm) below the steam line.
- 7 Steam lines are not permitted to merge except at the blower pack (and only through a Condair adaptor), and must have a condensate line just before the restriction.

5.5 Installation Kit

The Condair Blower Pack is shipped with an installation kit for all remote installations. The contents of the installation kit are shown in [Table 3](#) below.

Note: The content of the installation kit is site-specific, and may vary for your site.

Table 3: Installation Kit

Description	Quantity	
	Small 7/8 in (22.5 mm) Steam Inlet	Large 1-3/4 in (45 mm) Steam Inlet
Steam Hose, 7/8 in (22.5 mm) ID	1	-
Steam Hose, 1-3/4 in (45 mm) ID	-	1
Clamp Hose, Small	4	-
Clamp Hose, Large	-	4
Clamp Spring, Condensate Hose	6	4
Clamp Spring, 0.4 in (10 mm) OD	4	-
Condensate Hose, 3/8 in (9.5 mm) ID	1	1
Condensate Hose, 3/16 in (4.5 mm) ID	1	-
Tie Wrap, 4 in	4	4
Screw M4x8, Plastic	3	3
Power Cable	1	1
Reducer Fitting	1	-
Installation, Operation, Maintenance Manual	1	1

5.6 Remote-Mounted Installation for Blower Packs

Before proceeding with installation, Condair recommends that you familiarize yourself with ["Best Practices for Steam and Condensate Line Installation"](#) on page 19.

1. **Mounting the BlowerPack.** Locate the blower pack according to ["Location and Clearances"](#) on page 17, and install it on the mounting surface as follows:
 - a. Locate a 2×4 wooden stud or equivalent support in the mounting surface, and mark the attachment points "A" and "B" at the desired position with the help of a level – refer to [Figure 8](#).

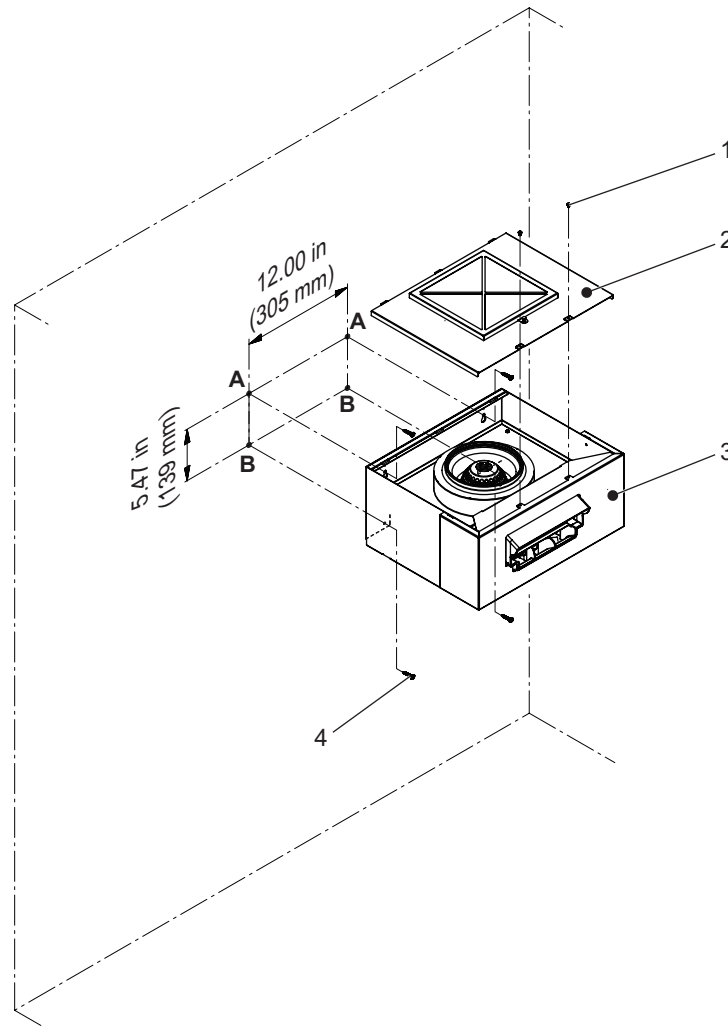


Figure 8: Wall-Mounted Blower Pack

- 1 Machine screw (×2)
- 2 Cover
- 3 Blower pack
- 4 Mounting screw (×4)

- b. Install two #10×3 in wood screws (supplied by others) at attachment points "A". Use longer screws if going through drywall or other structural material into the wooden studs. Allow the heads of the screws to extend 1/4 in (5 mm) from the mounting surface so that the blower pack can be installed on the screws.
 - c. Remove the two machine screws and the cover from the blower pack
 - d. Install the blower pack onto the two installed mounting screws.

- e. Align the Condair blower pack with the help of a level, then tighten the two mounting screws.
 - f. Install the cover and secure it with the two machine screws.
 - g. Install two more #10×3 in wood screws (supplied by others) into the mounting surface at attachment points "B".
2. **Connect Steam and Condensate Lines to the Blower Pack.** Plumb the steam line and the condensate drain line to the blower pack as follows:
- a. Plumb the steam line (supplied by others) and connect it to the steam adaptor on the blower pack with a short length of bulk steam hose and two hose clamps (supplied). Refer to [Figure 9 on page 28](#). If using a Condair steam hose, connect it to the steam adaptor with a hose clamp (supplied). Do not over-tighten the hose clamps – maximum torque is 16 in·lbs (180 N·cm).
 - b. Plumb the 3/8 in (9.5 mm) condensate drain line (supplied by others) and connect it to the blower pack condensate port with a short length of bulk 3/8 in (9.5 mm) hose and two spring clamps (supplied). If using a Condair condensate hose, connect it to the condensate port with a 3/8 in (9.5 mm) spring clamp (supplied).
 - c. Plumb the 3/16 in (4.5 mm) condensate drain line and connect it to the steam adaptor condensate return port with a short length of bulk 3/16 in (4.5 mm) hose and two spring clamps.
- Note:** The 3/16 in (4.5 mm) condensate line is not required for a large 1-3/4 in (45 mm) steam adaptor. The 3/16 in (4.5 mm) condensate line is used with the Condair RS 010-030.

3. **Connect Steam and Condensate Lines to Humidifier.** Connect the steam line and the condensate line to the humidifier as follows:

Condensate Line Connection

- a. Connect the condensate line from the blower pack to any of the following drain connections. Refer to [Figure 9 on page 28](#).
 - i. Humidifier cylinder port (if available)
 - ii. Humidifier drain port (if available)
 - iii. Building floor drain line

For a 1-3/4 in (45 mm) steam adaptor: connect the 3/8 in (9.5 mm) condensate line/hose from the blower pack to a drain connection listed above.

For a 7/8 in (22.5 mm) steam adaptor: connect the 3/8 in (9.5 mm) and 3/16 in (4.5 mm) condensate lines to a tee connector with short lengths of bulk hoses and spring clamps. Ensure that the tee connector is installed after the condensate traps, and connect the tee connector to any of the locations listed above. Refer to [Figure 9 on page 28](#).

- b. Make sure that a 3.94 in (100 mm) diameter trap is installed in the 3/8 in (9.5 mm) condensate line, and the trap is located a minimum of 12 in (300 mm) below the condensate outlet on the blower pack.

For a 7/8 in (22.5 mm) steam adaptor: ensure that a 2 in (50 mm) diameter trap is installed in the 3/16 in (4.5 mm) condensate line.

Steam Line Connection

- a. Connect the other end of the steam line to the steam outlet on the humidifier with a short length of bulk steam hose and two hose clamps. If using a Condair steam hose, connect it to the steam outlet with a hose clamp (supplied). Refer to [Figure 9 on page 28](#). Do not over-tighten the hose clamps – maximum torque is 16 in·lbs (180 N·cm).

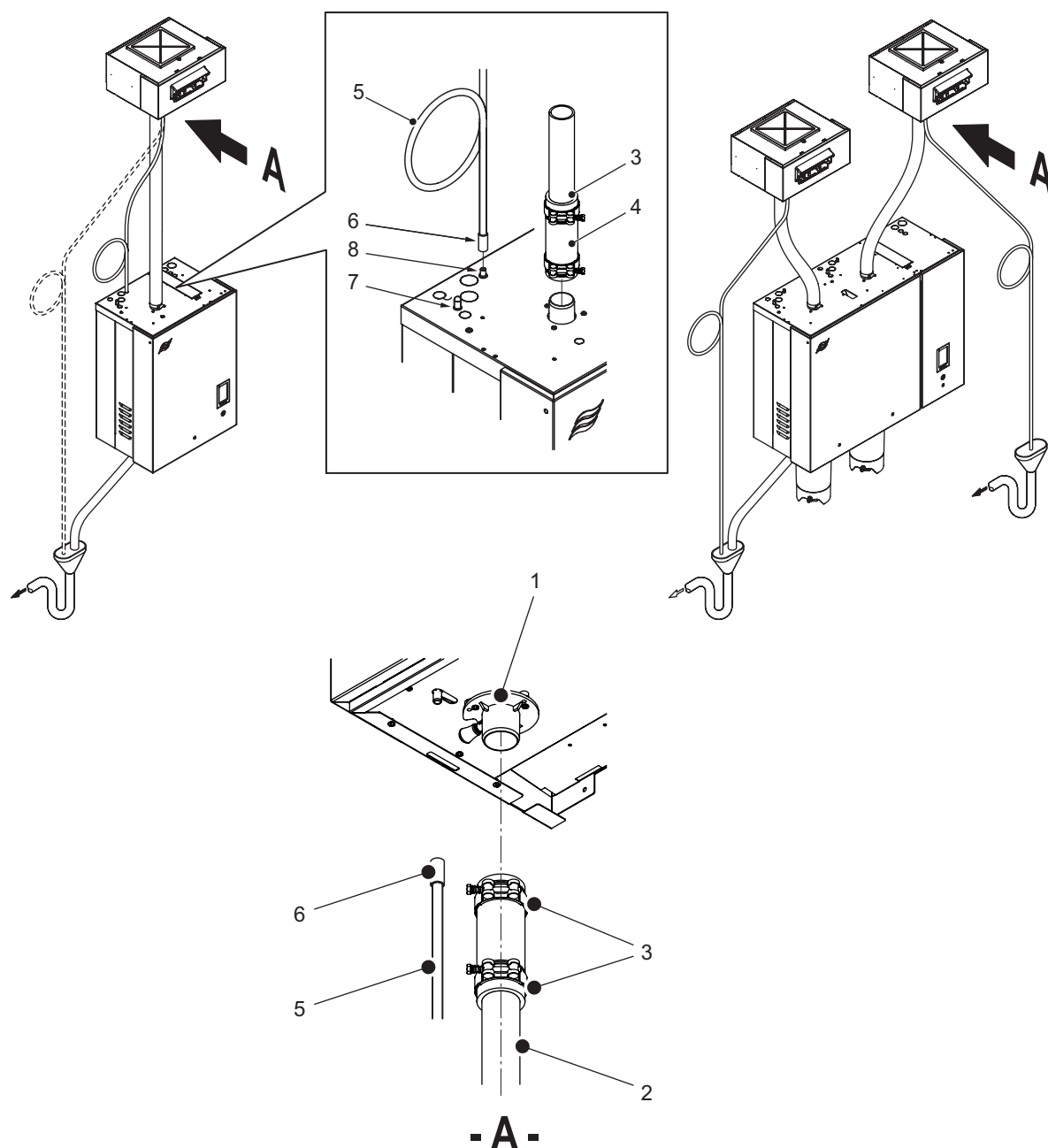


Figure 9: Steam and Condensate Line Connections on Condair blower pack

- | | | | |
|---|--------------------------------|---|---|
| 1 | Steam adaptor 1-3/4 in (45 mm) | 5 | Condensate line 3/8 in (9.5 mm) |
| 2 | Hose clamp | 6 | Condensate hose 3/8 in (9.5 mm), bulk |
| 3 | Steam lin, rigid pipe | 7 | Condensate return (cylinder) port on humidifier |
| 4 | Steam hose, bulk | 8 | Condensate drain port on humidifier |

4. **Electrical Connections.** Connect the power supply and security loop cables as follows:

Safety

The electrical installation work requires removal of the cover/door panels on the blower pack and humidifier. Please note the following:



DANGER!
Risk of electric shock!

The Condair humidifier and blower pack are mains powered. Live parts may be exposed when the door panels/covers are removed. Touching live parts may cause severe injury or even death.

Prevention: The Condair humidifier and blower pack must be connected to the mains only after all installation work has been completed, checked for correct workmanship, and the cover/door panels are installed and fastened securely.



CAUTION!
Electrostatic discharge (ESD)!

The electronic components inside the humidifier are sensitive to electrostatic discharge (ESD).

Prevention: Take appropriate measures to protect the electronic components inside the unit against damage caused by electrostatic discharge (ESD). Refer to ANSI/ESD-S20.20.

Please also observe the following:

- 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 connections must be performed according to the wiring diagrams in the humidifier manual and this manual, the instructions in this section, as well as applicable local and national codes.
- Make sure that the available voltage and phase of the power supply match the requirements for the blower pack, as indicated on the specification label. Refer to [Figure 2 on page 11](#).
- All cables must lead into the unit through appropriate cable glands and must be secured with clamp straps.
- Cables must be secured with tie wraps (supplied) to prevent rubbing on any components, or become a tripping hazard.
- Observe local and national codes for maximum cable length and required wire sizes for cables.



DANGER!
Risk of electric shock!

Touching live parts may cause severe injury or even death.

Prevention: DO NOT plug the blower pack into a wall outlet until all installation work has been completed and checked.

- a. Plug the power cable (supplied) and the security loop cable (supplied by others) into the back of the blower pack, but DO NOT plug the power cable into a wall outlet at this point. Refer to [Figure 10](#).

Note: For a Condair RS humidifier, the blower pack power cable can be plugged either into a wall outlet or into the humidifier's power supply (using an optional power kit available from your Condair representative). Connection to the optional power kit is described in [Step e on page 31](#).

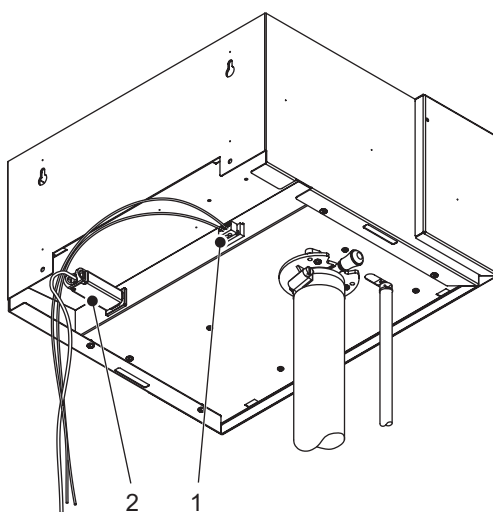


Figure 10: Condair Blower Pack Electrical Connections

- 1 Security loop connector
- 2 Power connector wire (14 AWG-18 AWG)

- b. Punch the knockout hole in the top of the humidifier that is located directly below the blower pack power connector. Refer to [Figure 11](#).
- c. Install a grommet (supplied) in the knockout hole, and route the security loop cable (and the power cable if using the optional power kit described above) through the grommet, as shown in [Figure 11](#).

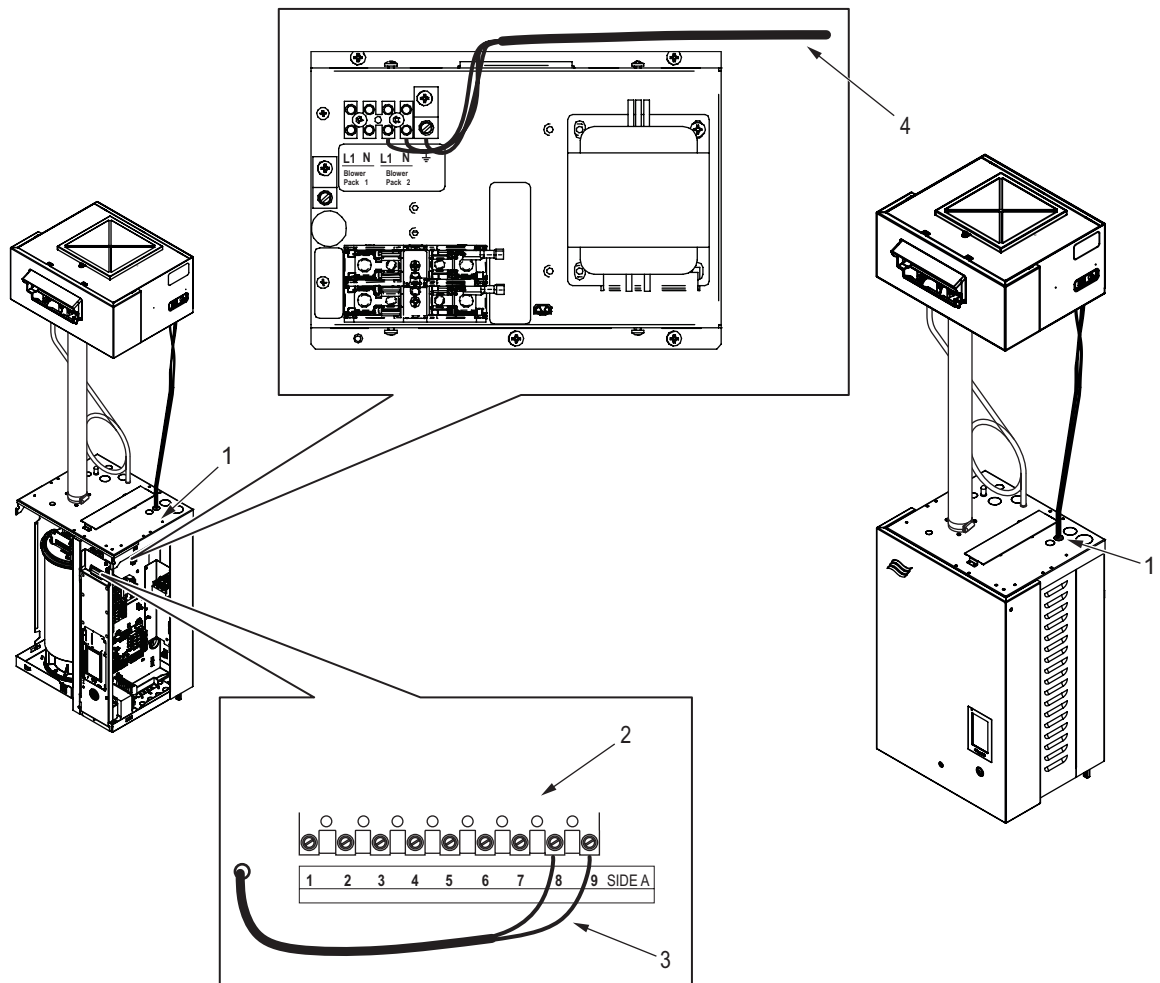


Figure 11: Humidifier Electrical Connections

- 1 Knockout hole with grommet
- 2 Low voltage terminal strip
- 3 Security loop cable (wiring supplied by others)
- 4 Power cable (provided)*

* if a longer power cable is required, please contact your local Condair representative for wire specifications and sizes.

- d. Remove the door panel on the humidifier control cabinet.
 - e. Run the security loop cable (and power cable - EL units only) along the cable chase and connect the leads to the terminal strips inside the humidifier unit, as shown in [Figure 11](#). Ensure that the line wire in the **power cable is connected to "L1"**, the **neutral wire to "N"** and the **ground wire to "GND"** in the terminal strip. Use strain relief for power wires and follow all local codes for installation.
 - f. Connect security loop cables:
Condair RS: connect the cable to pins "8" and "9" in the low voltage terminal strip.
 - g. Install the humidifier door panel, and fasten it securely.
5. Perform the checks described in ["Post-Installation Checklist"](#) on page 32.

5.7 Post-Installation Checklist

Check the following to ensure that the Condair blower pack has been installed correctly:

Mounting

- ☐ Unit installed according to ["Location and Clearances" on page 17?](#)
- ☐ Mounting surface stable?
- ☐ Unit aligned properly – vertically and horizontally?
- ☐ Unit fastened securely?

Steam Line

- ☐ Line does not exceed maximum length listed in [Table 2 on page 21?](#)
- ☐ Use long radius elbows (minimum bend radius of 5× internal diameter)? Steam hose (if used) has minimum bend radius of 12 in (300 mm)?
- ☐ Steam line has constant slope (minimum upslope of 10° or minimum downslope of 2°)?
- ☐ Observed best practices for steam and condensate lines?
- ☐ Steam line supported so it does not sag?
- ☐ Steam hose attached securely with clamps? Clamps torqued to a maximum of 16 in·lbs (180 N·cm)?
- ☐ Allowances for thermal expansion of rigid steam pipe, and shortening of the steam hose (if used) taken into consideration?

Condensate Line

- ☐ All condensate lines have constant minimum downslope of 1.2°?
- ☐ Condensate trap have a loop diameter of 3.94 in (100 mm) and installed at least 12 in (300 mm) below the condensate port on the blower pack?
- ☐ Condensate trap on a 3/16 in (4.5 mm) condensate line has a loop diameter of 2 in (50 mm)?
- ☐ Condensate lines installed at all low points and at horizontal-to-vertical transitions in the steam line?
- ☐ Condensate lines connect to full-size "Tee" connectors in steam line? Condensate traps at least 12 in (300 mm) below the "Tee" connectors?
- ☐ Maximum distance between condensate lines 15 ft (4.5 m)?
- ☐ Condensate traps primed with water?
- ☐ Condensate hoses not kinked, and secured properly?

Electrical

- ☐ Supply voltage meet the voltage requirements on the specification label?
- ☐ All wiring done according to the wiring diagram?
- ☐ Electrical installation meet the applicable local and national codes?
- ☐ All cables free of tension and pass through cable glands?
- ☐ All cables fastened securely?
- ☐ All covers and panels installed and fastened securely?

6 Commissioning

6.1 General

The Condair Blower Pack and humidifier must be commissioned and operated only by personnel who are adequately qualified and familiar with the humidifier and Nortec BP. It is the customer's responsibility to verify the qualifications of personnel.

6.2 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.

The steps are in the following order:

1. Inspect the mounting of the unit.
2. Inspect the steam line/hose installation.
3. Inspect the condensate drain line installation.
4. Inspect the electrical installation.
5. Configure the blower pack and humidifier.
6. Conduct performance tests, including controls.
7. Filling out the commissioning protocol documents.

7 Operation

7.1 Controls

There are no separate user controls on the Condair Blower Pack, except for the speed switch. The blower pack is interlocked with the humidifier, which controls its operation. Refer to [Figure 12](#).

Note: The speed switch is set to the specific humidification requirements of the room/facility during installation, and should not be altered.

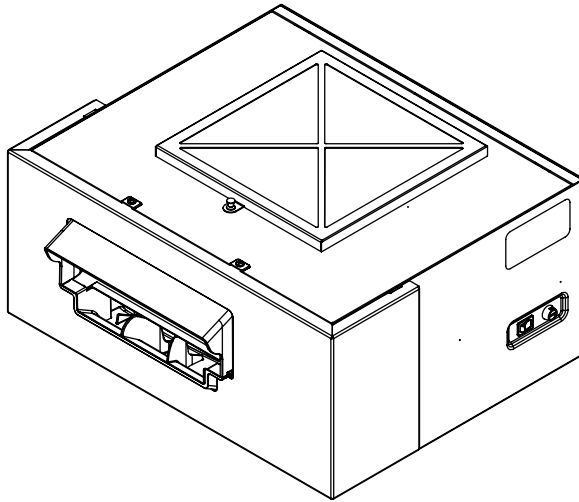


Figure 12: Condair Blower Pack

7.2 Starting and Stopping

When the Condair humidifier and blower pack are powered on, the contact in the blower pack safety relay closes, which allows the humidifier to produce steam when there is a demand for humidity.

Note: If the safety relay is open, or the security loop cable (wiring provided by others) is disconnected the humidifier will not generate steam.

As steam enters the blower pack the contact in the thermostat assembly closes, at which time the fan starts.

When the demand for steam is satisfied, the humidifier stops producing steam. The fan continues to run until the thermostat assembly cools down, at which time the contact in the thermostat assembly opens and the fan stops.

8 Maintenance

8.1 General

Strictly observe all safety precautions, and perform only those maintenance tasks described in this manual. Use only original Condair replacement parts.

Personnel Qualifications

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

Safety

The maintenance work may require removal of the cover on the blower pack. Please note the following:



DANGER!
Risk of electric shock!

The Condair Blower Pack is mains powered. Live parts may be exposed when the cover is removed. Touching live parts may cause severe injury or even death.

Prevention: Disconnect the power supply cable from the back of the blower pack before performing any maintenance work inside the blower pack.



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

The internal parts in the Condair Blower Pack may be hot to the touch. Bare skin in contact with hot surfaces can result in severe burns.

Prevention: Wait for the unit to cool down before opening up the blower pack.

8.2 Maintenance List

Perform the following maintenance tasks at the intervals specified in [Table 5](#). For the components referenced in the table refer to [Figure 13 on page 38](#).

Table 5: Maintenance List

Task/component	Frequency	Description
Check for water leaks	Regular intervals	Check the humidifier and blower pack for water leaks, stains and calcium deposits. If present, identify the source of the leak and tighten or replace components, as required.
Vacuum dust	Regular intervals	Vacuum the dust from the top of the blower pack including the optional filter (if installed). Dust accumulation can affect performance of the unit.
Replace air filter element	Regular intervals	Replace the element in the optional air filter if it is dirty.
Check for loose wiring	Regular intervals	Visually inspect external electrical wiring for loose connections or damage to the wiring. Repair as appropriate.
Clean the distributor assembly.	Regular intervals	Use a wet cloth to remove any scale, dust or debris that may have accumulated at the outlet of the distributor assembly. Remove any dust and debris from the perforated plates and louvers.
Replace steam inlet O-ring	Every two years	Replace the steam inlet O-ring every two years, or whenever the steam adaptor is replaced.

9 Fault Isolation

9.1 General Troubleshooting

Symptom	Probable Cause	Corrective Actions
Blower pack fan not operating.	<ol style="list-style-type: none"> 1. Normal operation – the fan turns on only when humidifier is generating steam. 2. No power to blower pack. 	<ol style="list-style-type: none"> 1. Check power connection. 2. Check the fuse in the blower pack. 3. Make sure that the humidifier operates, and there is a demand for humidity.
Blower pack fan not operating, but humidifier is generating steam.	<ol style="list-style-type: none"> 1. Steam line installed improperly leading to insufficient steam to the blower pack. 2. Thermostat stuck in the open position. 3. Jumper on blower pack security loop, and no power to the blower pack. 4. Faulty 8 μF capacitor. 	<ol style="list-style-type: none"> 1. Make sure that all installed steam hoses do not sag. 2. Make sure all condensate traps are correctly installed, primed properly and flowing. 3. Remove top panel, locate the thermostat assembly, and measure the continuity between terminals – must indicate a closed circuit. 4. Check that the security loop cable from the blower pack is connected to the humidifier. 5. Make sure that the security loop jumper wire is removed from the plug on the terminal strip. 6. Check the 8 μF capacitor. 7. See also "Blower pack fan not operating".
Blower pack fan running, but humidifier is not generating steam.	<ol style="list-style-type: none"> 1. Normal operation – it takes time for thermostat to cool down and open. 2. Very high ambient temperature. 3. Thermostat stuck in closed position. 	<ol style="list-style-type: none"> 1. Blower pack will run until thermostat cools down to 122 °F (50 °C). 2. Reduce ambient temperature to below 122 °F (50 °C). 3. Check that the thermostat opens when the blower pack cools below 122 °F (50 °C).
Humidifier not running, and displaying the warning message: "Security Loop Open".	<ol style="list-style-type: none"> 1. Security loop cable between the blower pack and humidifier is missing. 2. No power to the blower pack-Series blower pack. 3. Blown internal fuse in the blower pack. 4. Faulty safety relay, or power failure. 	<ol style="list-style-type: none"> 1. Connect the security loop cable to the blower pack. 2. Check power connection to the blower pack. 3. Check the blower pack internal fuse. 4. Check safety relay contacts close. 5. See also "Blower pack fan not operating".
Blower pack fan does not operate properly in the low speed setting.	<ol style="list-style-type: none"> 1. Faulty high/low speed switch, or the 20 μF capacitor. 	<ol style="list-style-type: none"> 1. Check the high/low speed switch and the 20 μF capacitor.

10 Replacement Parts

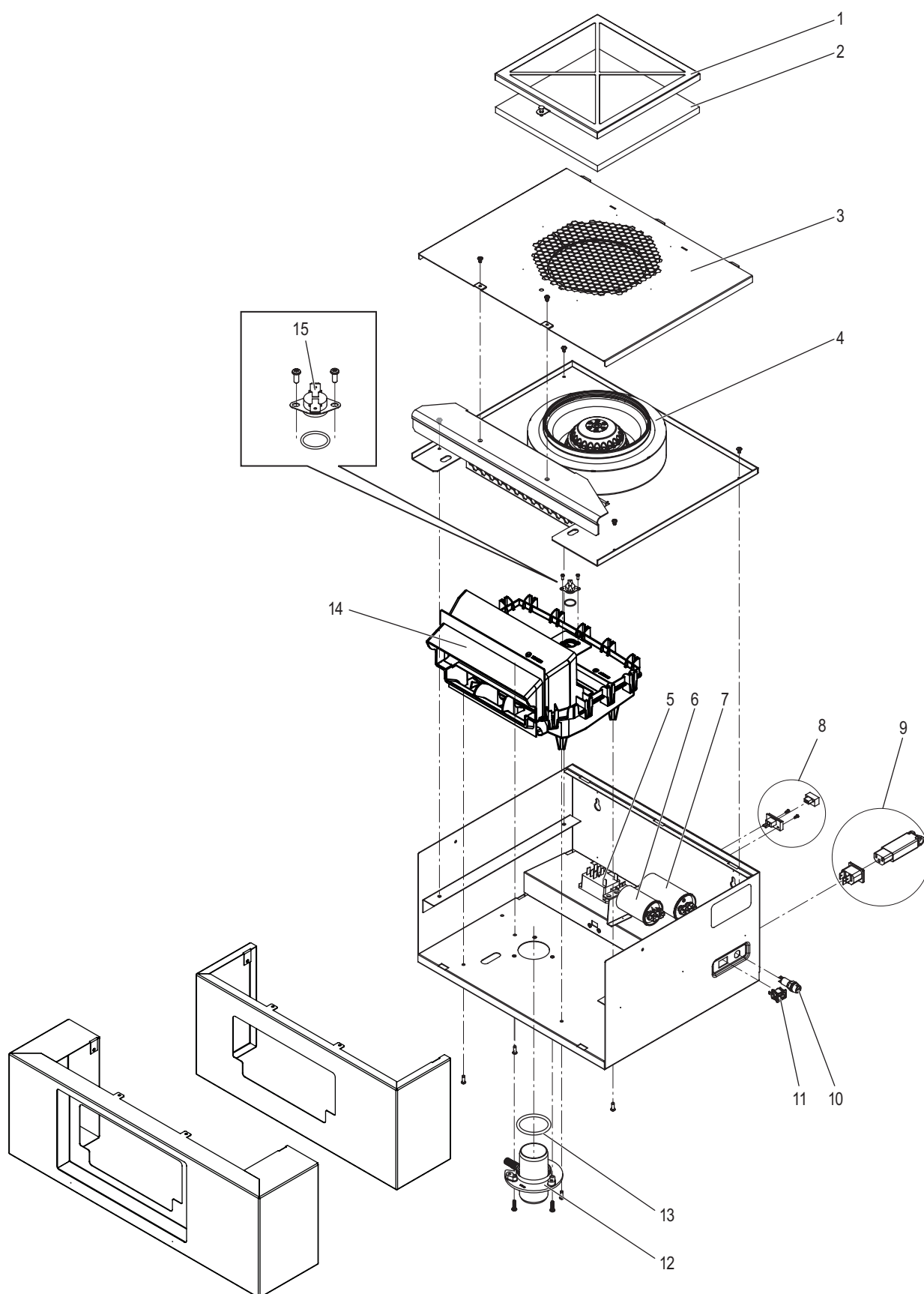


Figure 13: Condair Blower Pack Replacement Parts

Table 6: Condair Blower Pack Replacement Parts List

Item	Part Number	Description	Quantity
1	2579375	Filter assembly (includes filter element)	1
2	2579670	Filter element only	5
3	2579532	Cover assembly	1
4	2579531	Fan assembly, 115V	1
5	2579528	Safety relay assembly, 115V	1
6	2579529	Capacitor assembly, 8 μ F	1
7	2579530	Capacitor assembly, 20 μ F	1
8	2579391	Safety connector kit (includes hardware)	1
9	2579390	Power connector assembly (includes hardware)	1
10	2579392	Fuse assembly	1
11	2582281	Speed switch	1
12	2581248	Steam adapter kit, 1 3/4" (45 mm) (includes O-ring)	1
13	2579681	O-ring, steam inlet	3
14	2579384	Distributor assembly (includes O-ring)	1
15	2579527	Thermostat assembly	1

11 Wiring Diagram

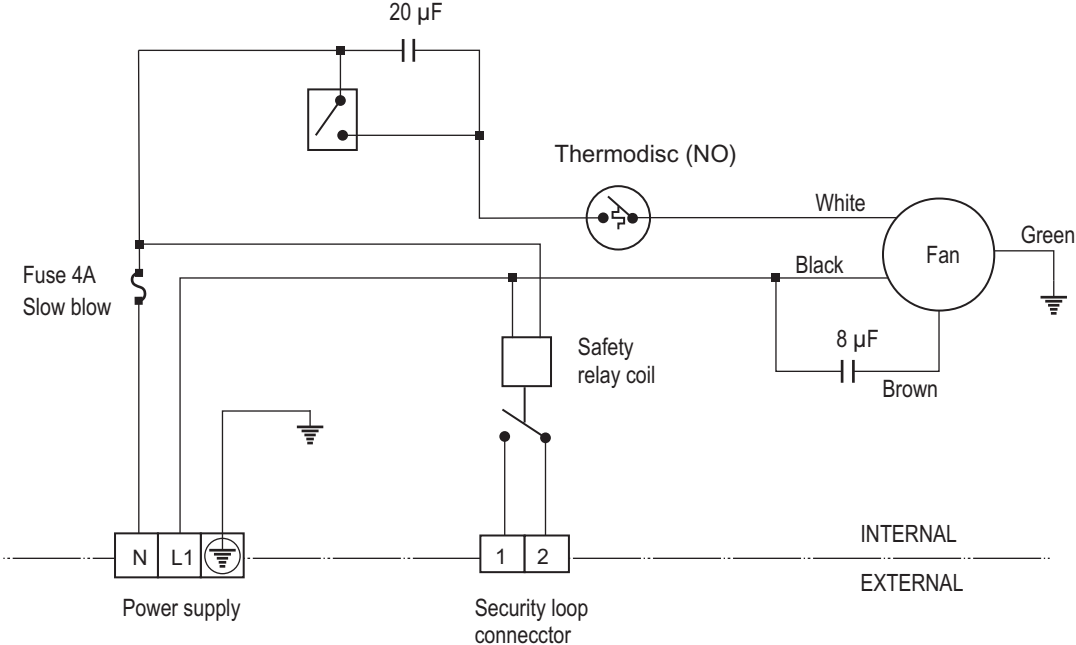


Figure 14: Condair Blower Pack Internal Wiring Diagram

12 Decommissioning

12.1 General

If the Condair blower pack 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

The decommissioning work will require removal of the covers/door panels on the blower pack and humidifier. Please note the following:



DANGER!
Risk of electric shock!

The Condair humidifier and blower pack are mains powered. Live parts may be exposed when the door panels/covers are removed. Touching live parts may cause severe injury or even death.

Prevention: The Condair humidifier and blower pack must be disconnected from the mains prior to disconnecting any components.



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

The internal parts in the Condair humidifier and blower pack may be hot to the touch. Bare skin in contact with hot surfaces can result in severe burns.

Prevention: Wait for the units to cool down before removing the cover/door panels.



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

The steam and condensate lines may be filled with hot fluids. Bare skin in contact with hot fluids can result in severe burns.

Prevention: Wait for the units to cool down, and wear appropriate personal protective equipment if necessary.



CAUTION!
Electrostatic discharge (ESD)!

The electronic components inside the humidifier are sensitive to electrostatic discharge (ESD).

Prevention: Take appropriate measures to protect the electronic components inside the unit against damage caused by electrostatic discharge (ESD). Refer to ANSI/ESD-S20.20.

12.2 Removing Unit from Service for Disposal

Remove the blower pack from service for disposal as follows:

1. Shut down the humidifier and disconnect the humidifier and blower pack from the mains.
2. If necessary, wait for the units to cool down to room temperature.
3. Disconnect the power and security loop connections from the terminal strips in the humidifier. Refer to [Figure 11 on page 31](#).
4. Disconnect the steam and condensate lines and empty out all fluids.
5. Remove the blower pack from its mounting surface.

12.3 Disposal/Recycling of the Unit

The blower pack and its components must not be disposed off in domestic waste, and should only be disposed off 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.

13 Product Specifications

13.1 Technical Data

Table 7: Technical Data

Parameter	Value
Maximum steam output (per Nortec BP)	100 lb/h (45 kg/h)
Power supply	110-120 V, 60 Hz
Power consumption	108 W
Sound power level	53.8 dB(A)*
Ingress protection rating	IP21

* Based on low speed setting with filter on, measured from a distance of 3 ft (1 m) from the front of the unit.

13.2 Operating Data

Table 8: Operating Data

Parameter	Value
Permissible ambient temperature	41-104 °F (5-40 °C)
Permissible ambient humidity	5-95% RH (non-condensing)
Condensate water temperature	140-212 °F (60-100 °C)

13.3 Size and Weight

Table 9: Size and Weight

Overall dimensions	15.75 in × 16.54 in × 10.16 in (400 mm × 420 mm × 258 mm)
Weight	28 lb (12.7 kg)

Refer to [Figure 15 on page 44](#) for dimensions.

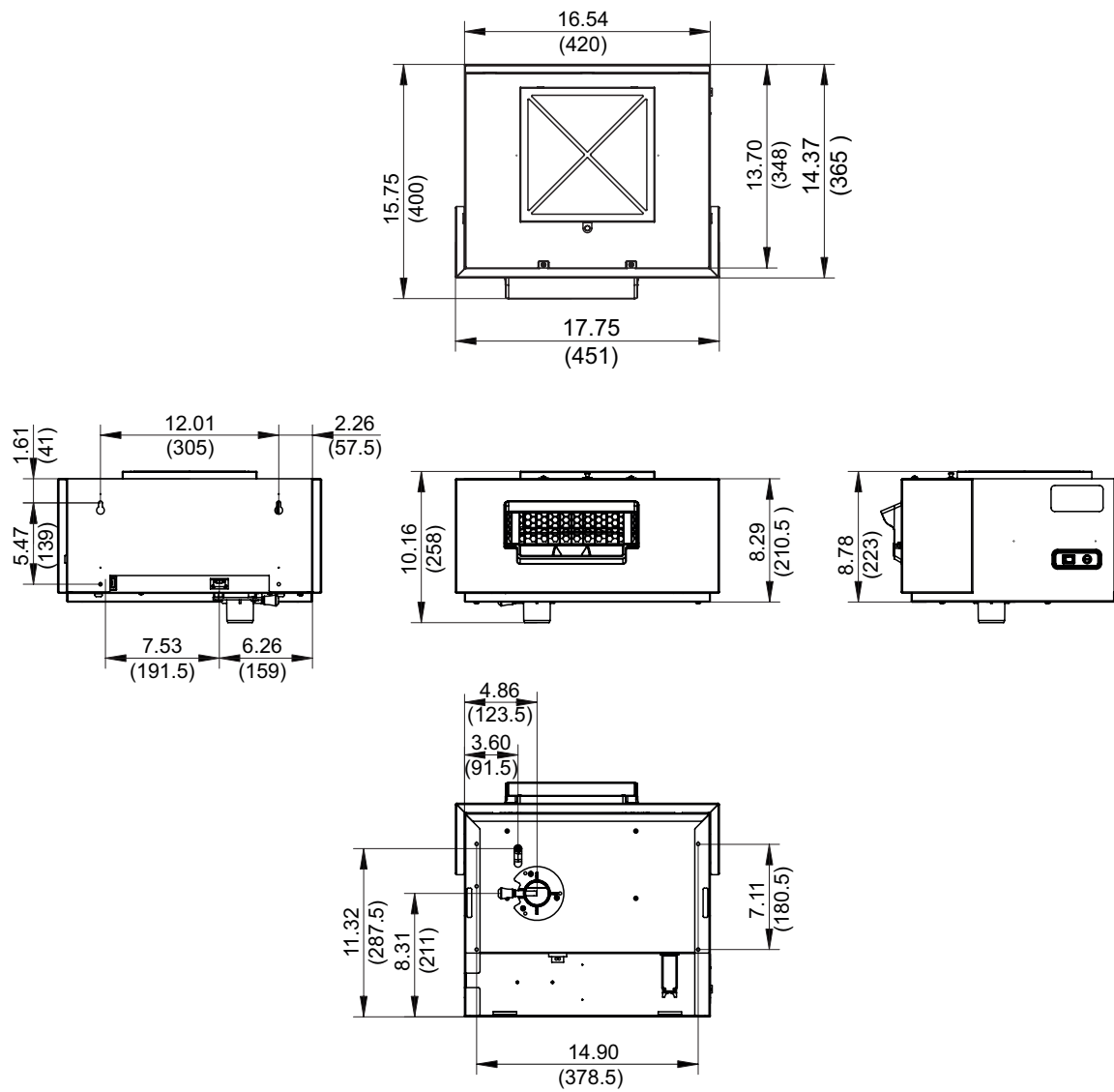


Figure 15: Overall Dimensions - Unit With Small Panel

Dimensions in inches, and values in brackets in millimeters.

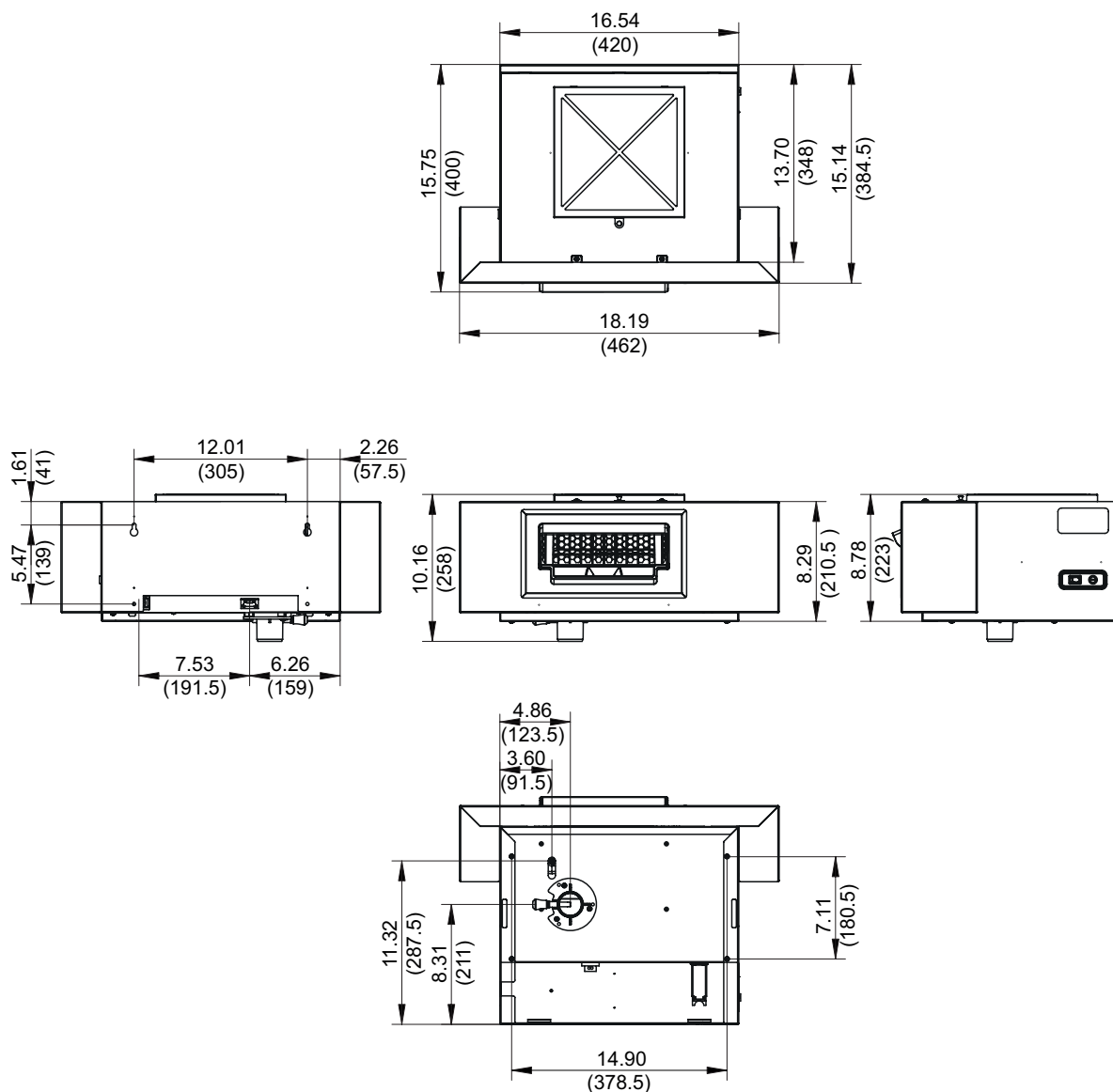


Figure 16: Overall Dimensions - Unit With Large Panel

Dimensions in inches, and values in brackets in millimeters.

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 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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