2582419-B EN 2102

RS SERIES

INSTALLATION MANUAL

Steam humidifier
Nortec **RS series**

Humidification and Evaporative Cooling

condair

Thank you for choosing Condair

Installation date (MM/DD/YYYY):
Commissioning date (MM/DD/YYYY):
Site:
Model:
Serial number:

Contact

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Contents

1 Introduction

1.1 To the very beginning

We thank you for having purchased the **Nortec RS steam humidifier**.

The Nortec RS steam humidifier incorporates the latest technical advances and meets all recognized safety standards. Nevertheless, improper use of the Nortec RS steam humidifier may result in danger to the user or third parties and/or damage to property.

To ensure a safe, proper, and economical operation of the Nortec RS steam humidifier, please observe and comply with all information and safety instructions contained in the present documentation as well as in the separate documentations of the components installed in the humidification system.

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

1.2 Notes on the installation manual

Limitation

The subject of this installation manual is the Nortec RS steam humidifier in its different versions. The various options and accessories are only described insofar as is necessary for proper operation of the equipment. Further information on options and accessories can be obtained in their respective instructions.

This installation manual is restricted to the **installation** of the Nortec RS steam humidifier and is meant for **well trained personnel being sufficiently qualified for their respective work**.

This installation manual is supplemented by various separate items of documentation (operation manual, spare parts list, etc.), which are included in the delivery as well. Where necessary, appropriate cross-references are made to these publications in the installation manual.

Symbols used in this manual

CAUTION!

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

WARNING!

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

DANGER!

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

Safekeeping

Please safeguard this installation manual in a safe place, where it can be immediately accessed. If the equipment changes hands, the documentation must be passed on to the new operator.

If the documentation gets misplaced, please contact your Condair representative.

2 For your safety

General

Every person, who is in charge of the installation work on the Nortec RS must have read and understood this installation manual and the Nortec RS operation manual before carrying out any work.
Knowing and understanding the contents of the installation manual and the operation manual is a basic requirement for protecting personnel against any kind of danger, to prevent faulty operation, and to operate the unit safely and correctly.

All icons, signs and markings applied to the Nortec RS must be observed and kept in readable state.

Qualification of personnel

All installation work described in this installation manual **may only be carried out by specialists who are well trained and adequately qualified and are authorised by the customer**.
For safety and warranty reasons any action beyond the scope of this manual must be carried out only by qualified personnel authorised by Condair.

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

Intended use

The Nortec RS steam humidifier is intended exclusively for air humidification via a steam distributor or a blower pack approved by Condair within specified operating conditions (see Nortec RS operation manual). Any other type of application, without the written consent of Condair, is considered as not conforming with the intended purpose and may lead to the Nortec RS becoming dangerous and will void any warranty. Operation of the equipment in the intended manner requires **that all the information contained in this installation manual are observed (in particular the safety instructions)**.

Danger that may arise from the Nortec RS:

DANGER!
Danger of electric shock!

The Nortec RS is mains powered. Live parts may be exposed when the unit is open. Touching live parts may cause severe injury or danger to life.

Prevention: The Nortec RS must be connected to the mains only after all mounting and installation work has been completed, all installations have been checked for correct workmanship and the unit is closed and properly locked.

Preventing unsafe operation

All persons working with the Nortec RS are obliged to report any alterations to the unit that may affect safety to the owner without delay and to **secure the Nortec RS against accidental power-up**.

Prohibited modifications to the unit

No modifications must be undertaken on the Nortec RS without the express written consent of Condair.

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

3 Product Overview

3.1 Models overview

Nortec RS steam humidifiers are available in **different housing sizes (S, M and L)** with **different heating voltages** and **steam capacities ranging from 10 lbs/hr up to a maximum of 180 lbs/hr (5 ... 80 kg/h)**.

3.1.1 Units small ("S") and medium ("M")

Housing size	Nortec RS	208 V/1~	240 V/1~	480 V/1~	600 V/1~	208 V/3~	240 V/3~	480 V/3~	600 V/3~
		lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)
S	**...10...**	10.9 (4.9)	10.9 (4.9)	9.7 (4.4)	11.4 (5.2)	10.9 (4.9)	10.9 (4.9)	11.3 (5.1)	11.1 (5.0)
	...15...	15.9 (7.2)	14.5 (6.6)	14.1 (6.4)	14.7 (6.7)	15.9 (7.2)	14.5 (6.6)	14.6 (6.6)	17.6 (8.0)
	...20...	21.2 (9.6)	21.2 (9.6)	18.8 (8.5)	19.6 (8.9)	21.2 (9.6)	21.2 (9.6)	19.4 (8.8)	22.8 (10.3)
M	**...30...**	31.8 (14.4)	31.8 (14.4)	31.5 (14.3)	31.4 (14.2)	28.8 (13.1)	31.8 (14.4)	31.5 (14.3)	31.4 (14.2)
	...45...	—	—	—	—	47.7 (21.6)	47.9 (21.7)	45.2 (20.5)	47.1 (21.4)
	...65...	—	—	—	—	71.6 (32.5)	71.9 (32.6)	63.0 (28.6)	70.6 (32.0)
	...90...	—	—	—	—	—	—	94.6 (42.9)	94.3 (42.8)

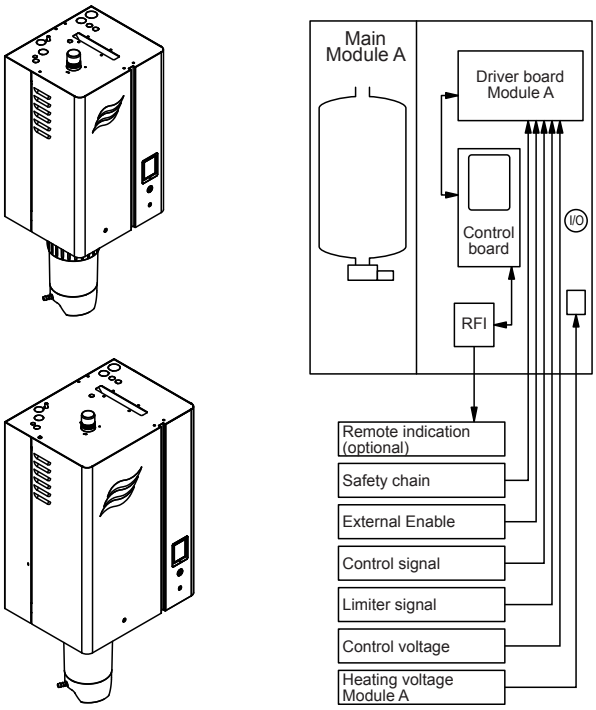


Fig. 1: Overview units small ("S") and medium ("M")

3.1.2 Units Large ("L")

Housing size	Nortec RS	208 V/1~	240 V/1~	480 V/1~	600 V/1~	208 V/3~	240 V/3~	480 V/3~	600 V/3~
		lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)	lbs/hr (kg/h)
L	...90...	—	—	—	—	95.4 (43.3)	94.6 (42.9)	—	—
	...130...	—	—	—	—	143.2 (65.0)	141.8 (64.3)	126.0 (57.2)	141.2 (64.1)
	...180...	—	—	—	—	—	—	189.2 (85.8)	188.6 (85.5)

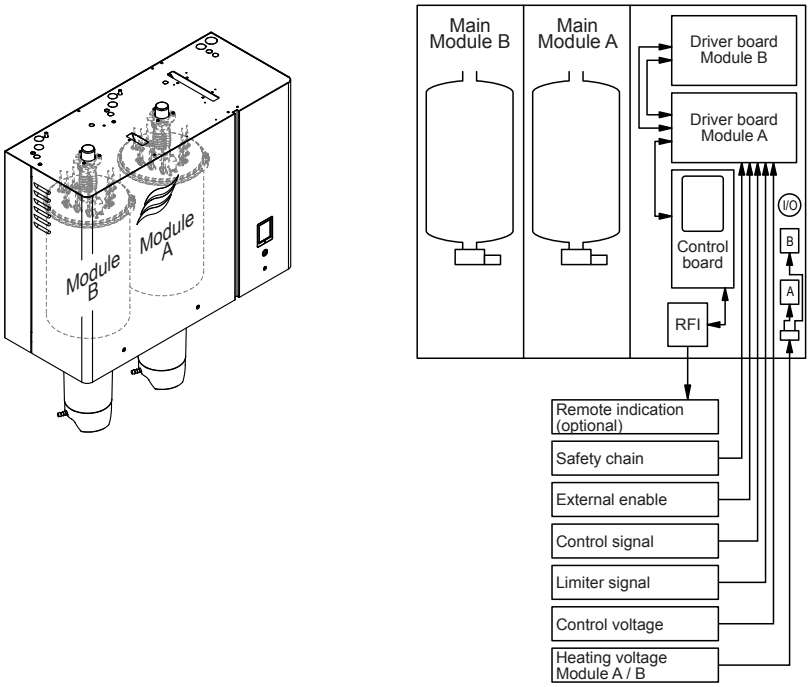


Fig. 2: Overview units large ("L")

3.2 Identification of the unit

The identification of the unit is found on the specification label.

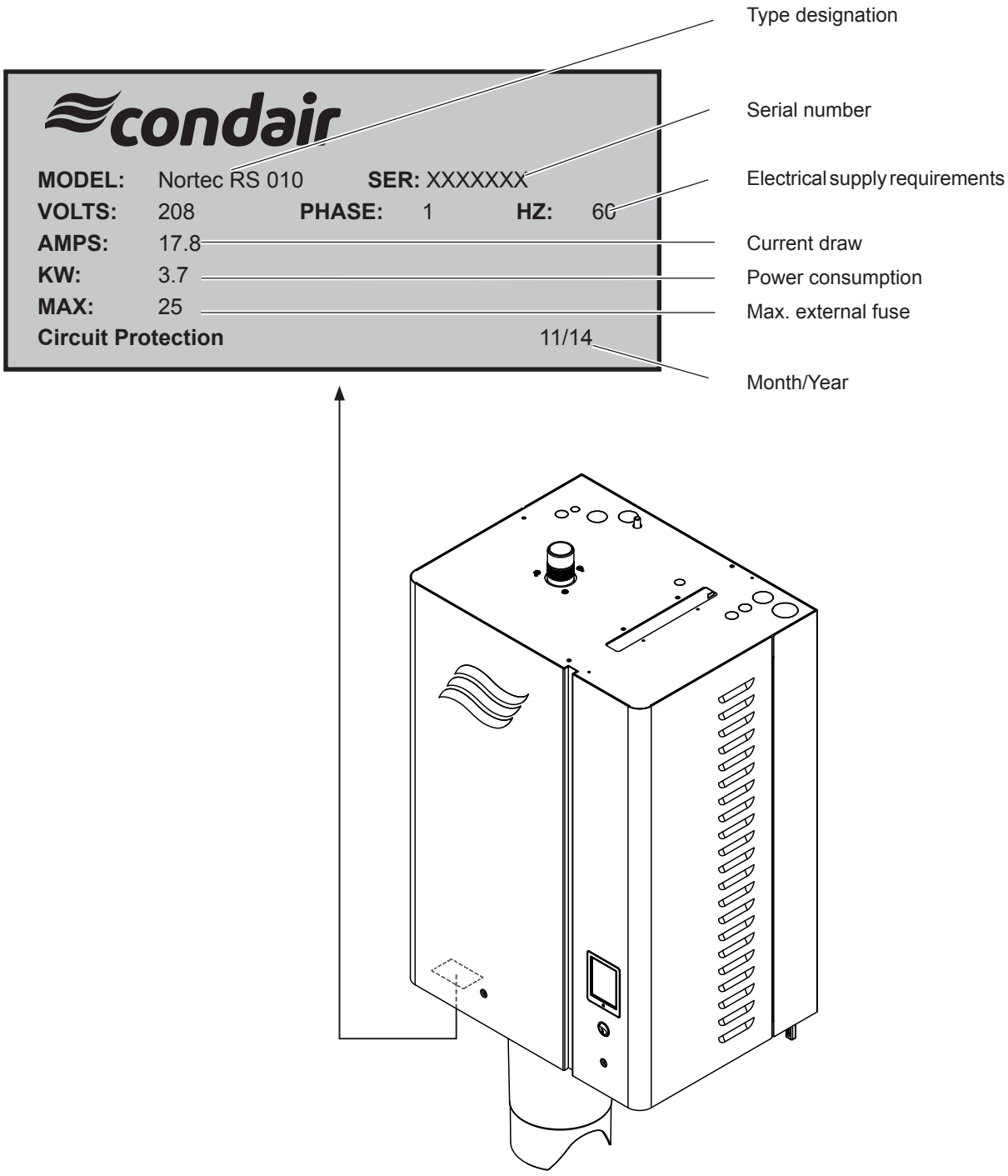


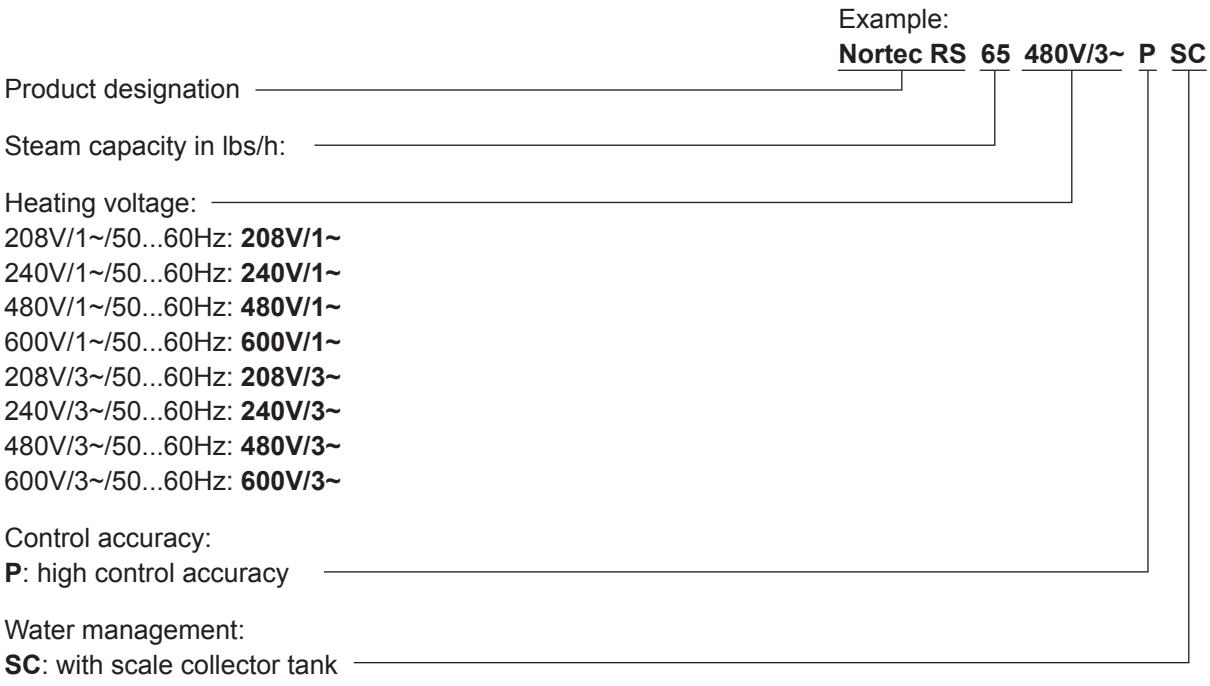
Fig. 3: Specification label location and details

3.3 Product designation

The product designation and the most important unit data are found on the specification label fixed on the right side of the Nortec RS.

Notes regarding the specification label can be found in the Nortec RS operation manual.

Key model designation



3.4 Options

	Nortec RS									
	Single units "S"			Single units "M"				Large units "L"		
	10	15	20	30	45	65	90	90	130	180
Process/Precision Provides capability of humidifier to achieve ± 1% humidity control*. Solid State Relays allow for rapid response upon call for humidity, adapting instantly to humidity demand. This allows for quick response and tight control of humidity. Also supplied are two fill valves for quicker response (turbo mode). Note: this option is always recommended when using modulating controls. * Humidity control is dependent on a variety of factors, including design of piping from humidifier to distributor, duct characteristics from distributor to space, control devices and locations. In-field results may vary.	**1x P**									
Scale tank Provides a separate reservoir underneath the steam cylinder for scale collection. The addition of this option reduces maintenance time significantly. Minerals removed from the water during steam production will collect in the scale reservoir rather than in the tank. For the double tank humidifiers (RS 135 and 180), order two for each humidifier. Note: this option is recommended when the Nortec RS is supplied potable water.	**1x SC**							**2x SC**		
Built-on Blower Pack For in-space applications.	**1x BOBP**							**N/A**		
Remote operating and fault indication PCB with relay contacts for the connection of remote displays for "Operation", "Steam", "Fault" and "Service".	**1xRFI**									
Accessory Board PCB with relay contacts for the connection of remote fan enable (cylinder A/B) as well as hygiene flush (cylinder A/B).	**1x ACC**									
BACnet MSTP BTL PCB to provide BTL certified BACnet MSTP.	**1x BAC-BTL**									
LonWorks board Supplementary board to connect the Nortec RS to a building management system via LonWorks.	**1x LON**									
RS-RO Secondary inlet valve for dedicated drain water cooling using potable water. This option is used when treated RO/DI water is being supplied to the steam tank.	**1xRS-RO**									

3.5 Accessories

	Nortec RS									
	Single units "S"			Single units "M"				Large units "L"		
	10	15	20	30	45	65	90	90	130	180
Pure water system Condair RO-A Pure water system for operating the Nortec RS with RO water.	**1xRO-A40**							**1xRO-A100**		

4 Receiving and storage

4.1 Inspection

After receiving:

- Inspect shipping boxes for damage.
  Any damages of the shipping boxes must be reported to the shipping company without delay.
- Check packing slip to ensure all parts have been delivered.
  All material shortages are to be reported to your Condair supplier within 48 hours after receipt of the goods. Condair assumes no responsibility for any material shortages beyond this period.

  The standard delivery includes:

  - Nortec RS steam humidifier equipped with the options ordered according *Section 3.4*, packed in cardboard box with:
    - Fastening set
    - Installation manual (this document), operation manual and spare parts list
    - Water drain hose with hose clamp
- Unpack the parts/components and check for any damage.
  If parts/components are damaged, notify the shipping company immediately.
- Check whether the components are suitable for installation on your site according to unit data stated on the specification label.

4.2 Storage and Transportation

Storing

Until installation store the Nortec RS in its 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 unit and components in their original packaging and use appropriate lifting/transporting devices.

WARNING!

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

Packaging

Keep the original packaging of the components for later use.

In case you wish to dispose of the packaging, observe the local regulations on waste disposal. Please recycle packaging where possible.

5 Mounting and installation work

5.1 Safety notes on mounting and installation work

Qualification of personnel

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

General notes

Strictly observe and comply with all information given in the present installation manual regarding the mounting of the unit and the installation of water, steam and electricity.

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

Safety

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

DANGER!
Danger of electric shock!

The Nortec RS is mains powered. Live parts may be exposed when the unit is open. Touching live parts may cause severe injury or danger to life.

Prevention: The Nortec RS must be connected to the mains only after all mounting and installation work has been completed, all installations have been checked for correct workmanship and the unit is closed and properly locked.

CAUTION!

The electronic components inside the humidifier are very sensitive to electrostatic discharge.

Prevention: To protect these components against damage caused by electrostatic discharge (ESD protection) appropriate measures must be taken when the unit is open for installation work.

5.2 Installation overviews

Typical installation for duct humidification

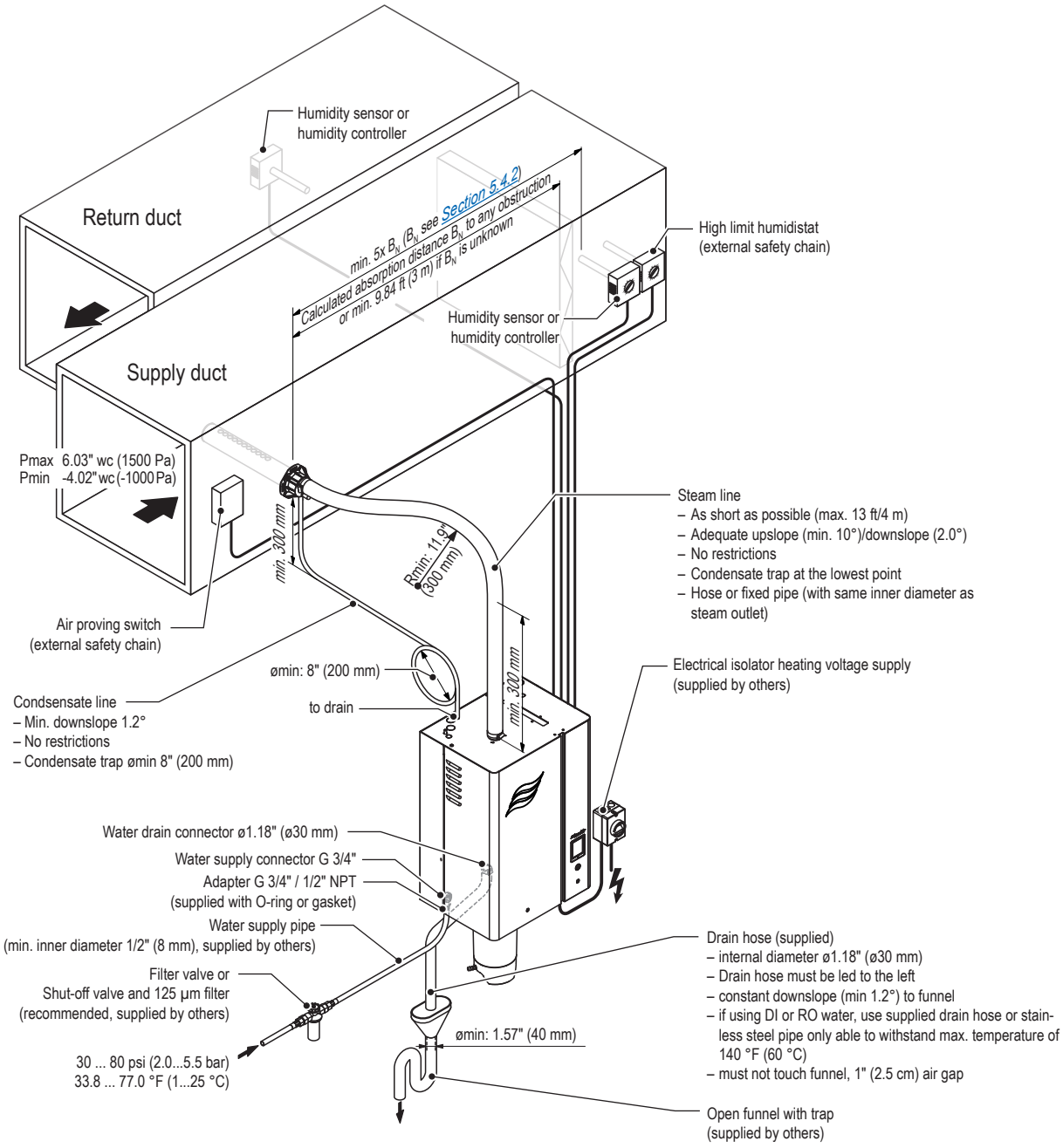


Fig. 4: Typical installation for duct humidification

Note: For water supply connection of units equipped with RS-RO option, refer to *Fig. 6*.

Typical installation for room humidification

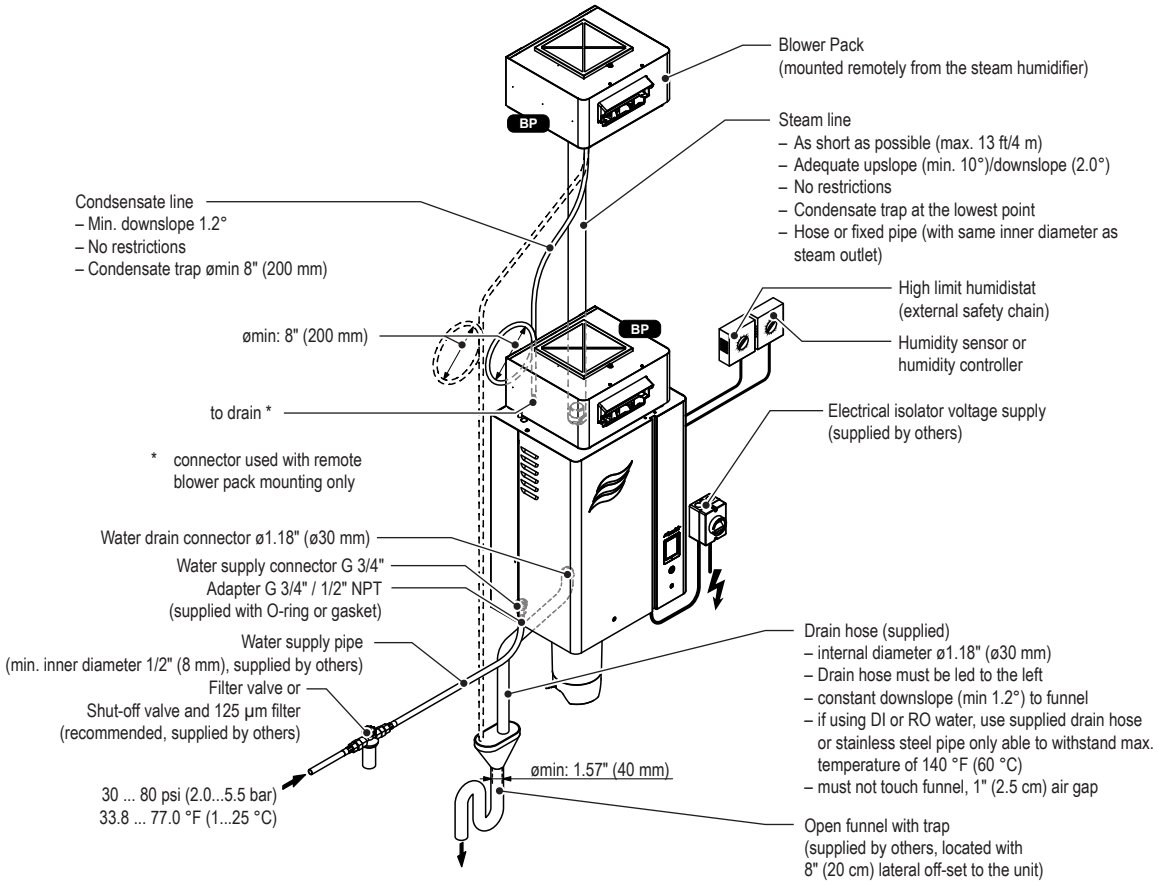


Fig. 5: Typical installation for room humidification

Note: For water supply connection of units equipped with RS-RO option, refer to *Fig. 6*.

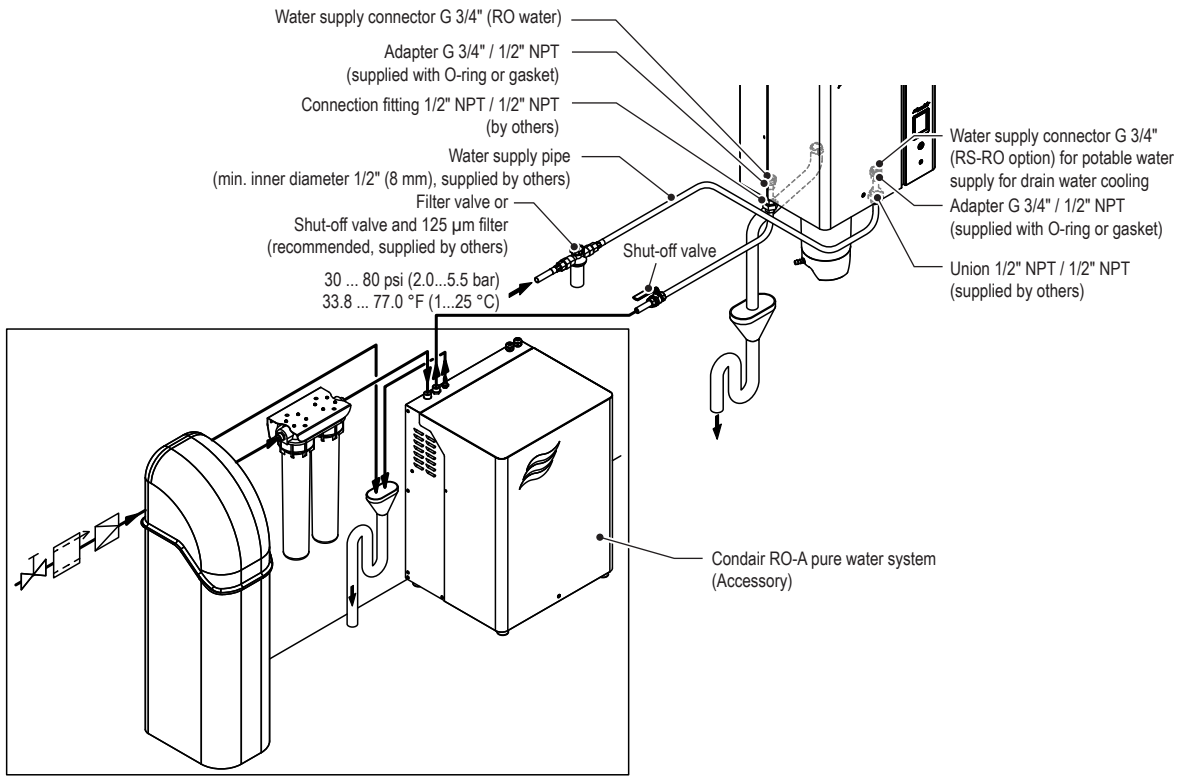


Fig. 6: Water supply connections for units installed with RS-RO option

5.3 Mounting the unit

5.3.1 Notes on locating the unit

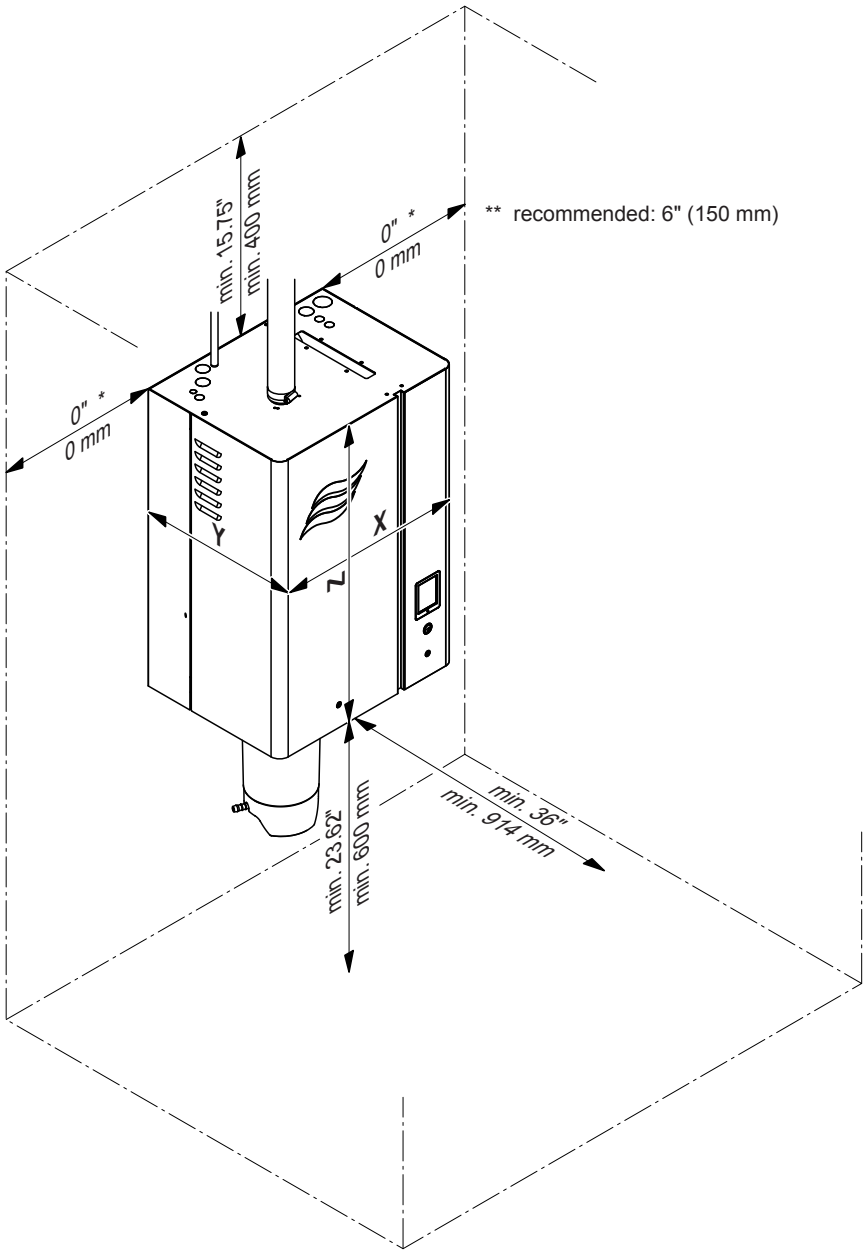


Fig. 7: Minimal distances to be observed

Housing		Small ("S") RS 10...20	Medium ("M") RS 30...90	Large ("L") RS 90...180
Housing dimensions in inch (mm)	X	16.54" (420)	20.87" (530)	29.37" (1000)
	Y	14.57" (370)	15.98" (406)	15.98" (406)
	Z	26.38" (670)	30.71" (780)	30.71" (780)
Netweight in lbs (kg)		60.0 (27.2)	88.9 (40.3)	178.5 (81.0)
Operating weight in lbs (kg)		88.8 (40.2)	145.0 (65.8)	291.0 (132.0)

The installation site of the Nortec RS depends largely on the location of the steam distributor (see *Section 5.4.2*). To **ensure proper functioning** of the steam humidifier and to **obtain an optimal efficiency**, the following points must be considered and observed when choosing the location for the steam humidifier:

- Install the steam humidifier so that:
  - the **length of the steam** line is kept as short as possible,
  - the **minimum bend radius for steam hoses (R= 12" / 300 mm)** and for **solid steam pipes (5 x internal diameter)** and the minimum **upslope (min. 10°)** and **downslope (min. 2°)** of the steam lines is maintained (see *Section 5.4.5*).
- The Nortec RS is designed for wall-mounting in protected interiors. Make sure that the construction (wall, pillar, floor-mounted console, etc.) to which the humidifier is to be mounted, offers a **sufficiently high load-bearing capacity** (take notice of the weight information found in the dimensions and weights table), and is suitable for the installation.

CAUTION!

Do **not** mount the steam humidifier directly to the ventilation duct (insufficient stability).

- The back panel of the Nortec RS retains heat during operation (max. surface temperature of the metal housing approx. 140 - 158 °F / 60 - 70 °C). Make sure, therefore, that the construction (wall, pillar, etc.) to which the unit is to be mounted, does not consist of heat-sensitive material.
- Install the Nortec RS in such a manner that it is **freely accessible** with sufficient space available for maintenance purposes. The **minimum distances** shown in the adjacent illustration **must be maintained**.
- The Nortec RS is protected according to **IP21**. Make sure the unit is installed in a drip-proof location and the admissible ambient conditions are complied with.
- Do **not** mount the Nortec RS to hot or very cold walls or near vibrating components.
- The steam humidifier Nortec RS must only be installed in rooms with a floor drain.

CAUTION!

If for some reason the Nortec RS must be installed in a location without floor drain, it is mandatory to provide a leakage monitoring device to safely interrupt the water supply in case of leakage.

- When mounting the Nortec RS use **only the mounting materials supplied with the unit**. If mounting with the materials supplied is not possible in your particular case, select a method of mounting that is of similar stability.
- The Nortec RS is designed for installation and operation within buildings (admissible temperature range 41... 104 °F / 5...40 °C). For outdoor operation the Nortec RS must be placed in a weather protective housing. If ambient temperatures near or below the freezing point have to be expected, the protective housing must equipped with a thermostat controlled heating of sufficient capacity. The water supply pipe must be equipped with a trace-heating and must be insulated up to the protective housing. The installation of a normally open valve inside the building envelope that will drain water in case of power failure is highly recommended

5.3.2 Mounting the humidifier

5.3.2.1 Standard mounting

Overview standard mounting single units Small and Medium

Dimension	Housing size	
	Small	Medium
"a" in inch/mm	2.13" (54.0)	2.13" (54.0)
"b" in inch/mm	17.56" (446.0)	21.89" (556.0)
"c" in inch/mm	3.16" (80.2)	3.49" (88.6)
"d" in inch/mm	12.00" (304.8)	16.00" (406.4)

Weights	Housing size	
	Small	Medium
Netweight in lbs/kg	60.0 / 27.2	88.9 / 40.3
Operating weight in lbs/kg	88.8 / 40.2	145.0 / 65.8

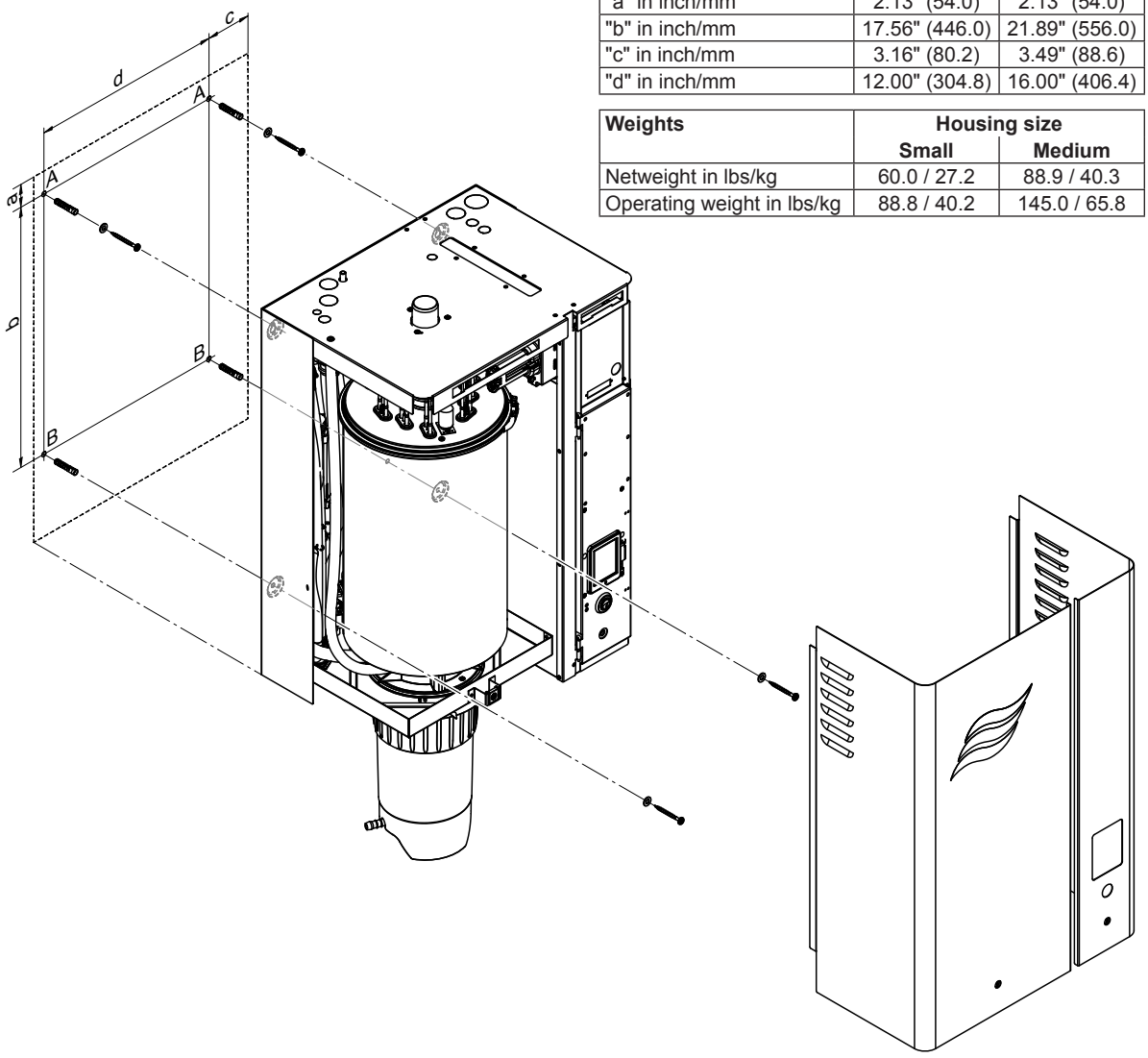


Fig. 8: Overview standard mounting single units Small and Medium

Overview standard mounting single units Large

Dimension	Housing size Large
"a" in inch/mm	6.46" (164.0)
"b" in inch/mm	16.77" (426.0)
"c" in inch/mm	4.61" (117.2)
"d" in inch/mm	16.00" (406.4)

Weights	Housing size Large
Netweight in lbs/kg	178.5 (81.0)
Operating weight in lbs/kg	291.0 (132.0)

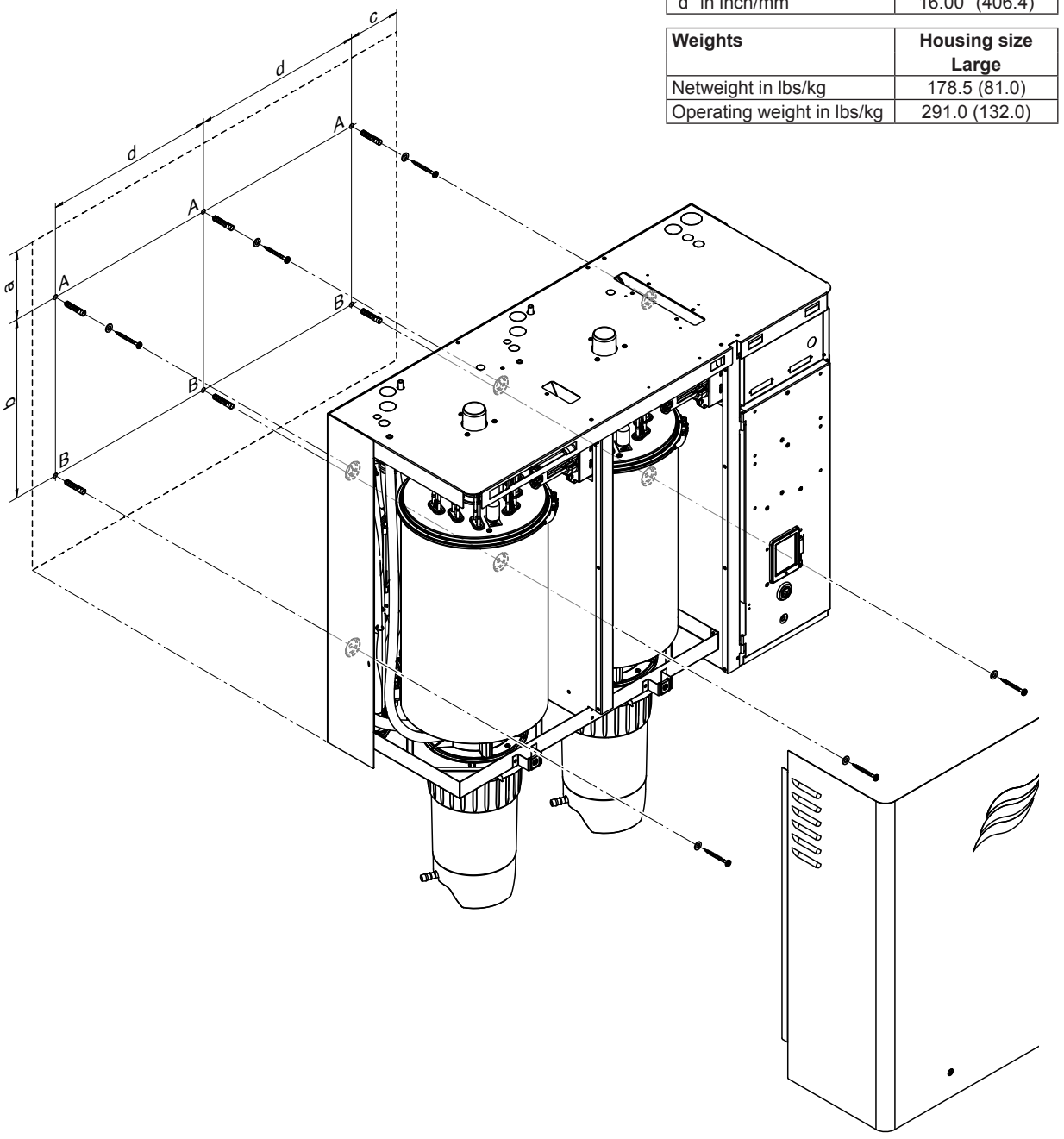


Fig. 9: Overview standard mounting single units Large

Mounting procedure standard mounting

1. Mark the attachment points "A" and "B" at the desired position with the help of a level. Then, drill holes diameter: 3/8" (10 mm), depth: 2" (50 mm).
2. Insert the supplied plastic plugs, and screw in supplied screws into the dowels of the attachment points "A" until the distance between the wall and the screw head is 0.2" (5 mm).
3. Unlock the screws of the front panels of the unit, then remove the front panels.
4. Hang up the unit onto the screws installed before.
5. Screw the supplied screws through the rear wall of the housing into the dowels of of the attachment points "B".
6. Align unit with the help of a level, then tighten the screws.
7. Reattach the front panels and secure with the screws.

5.3.2.2 Rail mounting (option)

Overview rail mounting single units Small and Medium

Dimension	Housing size	
	Small	Medium
"a" in inch/mm	7.62" (193.5)	7.62" (193.5)
"b" in inch/mm	12.00" (304.8)	16.00" (406.4)
"c" in inch/mm	2.27" (57.6)	2.43" (61.8)

Weights	Housing size	
	Small	Medium
Netweight in lbs/kg	60.0 / 27.2	88.9 / 40.3
Operating weight in lbs/kg	88.8 / 40.2	145.0 / 65.8

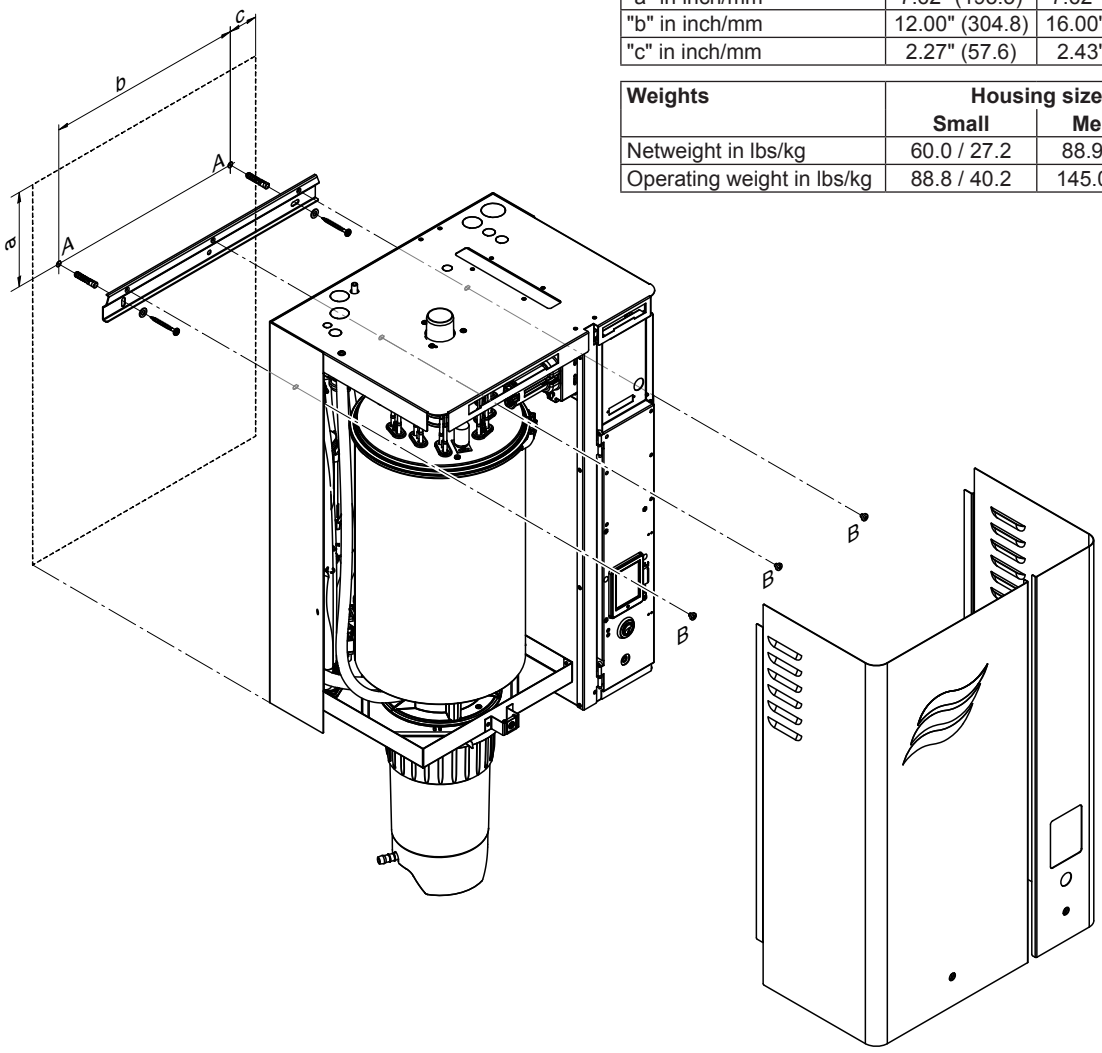


Fig. 10: Overview rail mounting single units Small and Medium

Overview rail mounting single units Large

Dimension	Housing size Large
"a" in mm	10.37" (263.5)
"b" in mm	16.00" (406.4)
"c" in mm	4.61" (117.2)

Weights	Housing size Large
Netweight in lbs/kg	178.5 (81.0)
Operating weight in lbs/kg	291.0 (132.0)

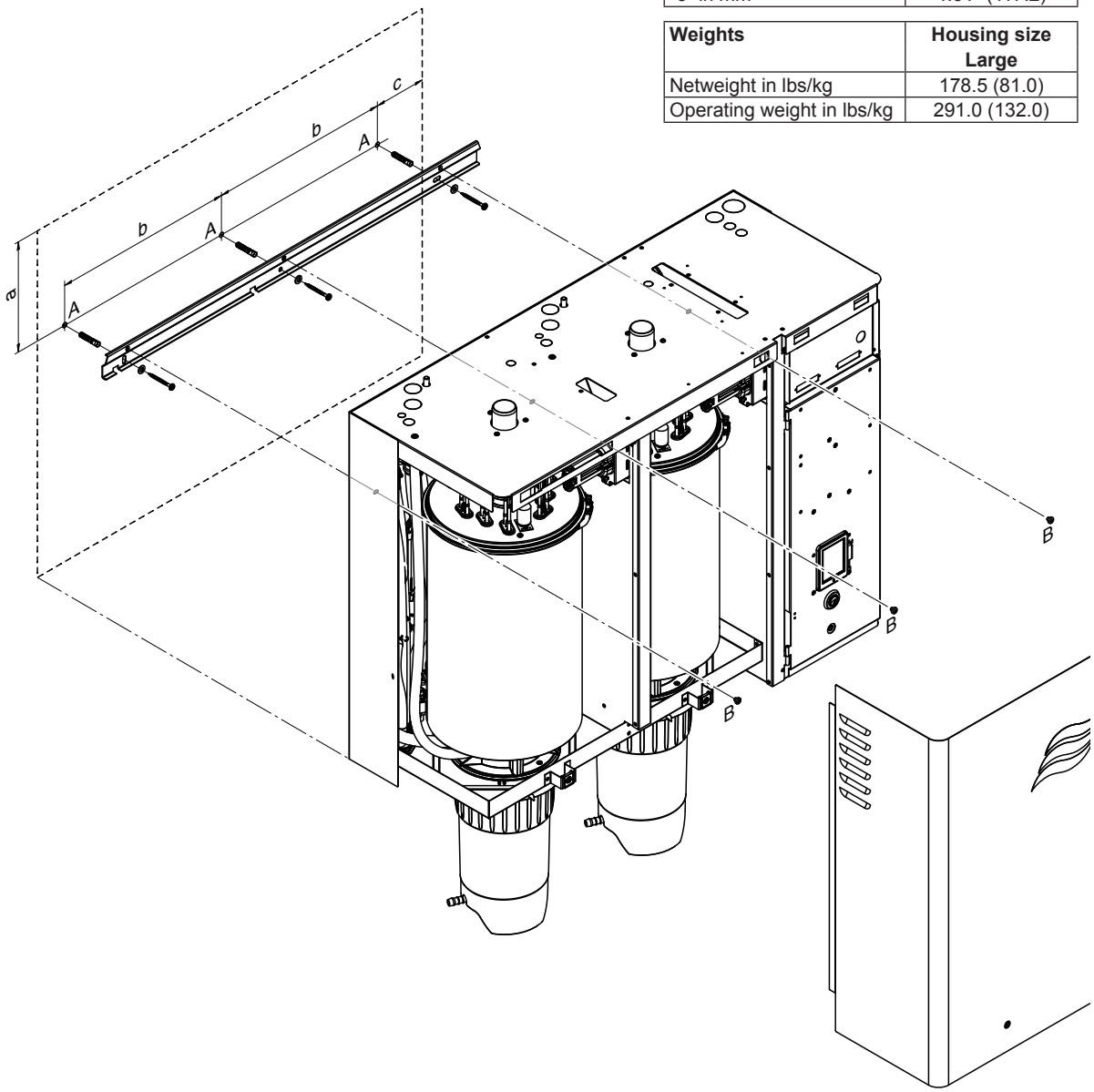


Fig. 11: Overview rail mounting single units Large

Procedure

1. Mark the attachment points "A" for the mounting rail at the desired position with the help of a level. Then, drill holes diameter: 3/8" (10 mm), depth: 2" (50 mm).
2. Insert the supplied plastic plugs, and fix the mounting rail to the wall with the screws and washers supplied. Before tightening the screws adjust mounting rail horizontally using a level.
3. Unlock the screw of the front panels, then remove the front panels.
4. Hang up the unit onto the mounting rail. Then, fix the unit to the mounting rail using the supplied screws "B".
5. Reattach the front panels and secure it with the screws.

5.3.3 Inspecting the installed unit

Check the following points:

☐ Is the unit installed in the correct place (see *Section 5.3.1*)?

☐ Is the supporting surface stable enough?

☐ Is the unit correctly aligned, vertically and horizontally?

☐ Is the unit properly secured (see *Section 5.3.2*)?

5.4 Steam installation

5.4.1 Overview steam installation for duct humidification

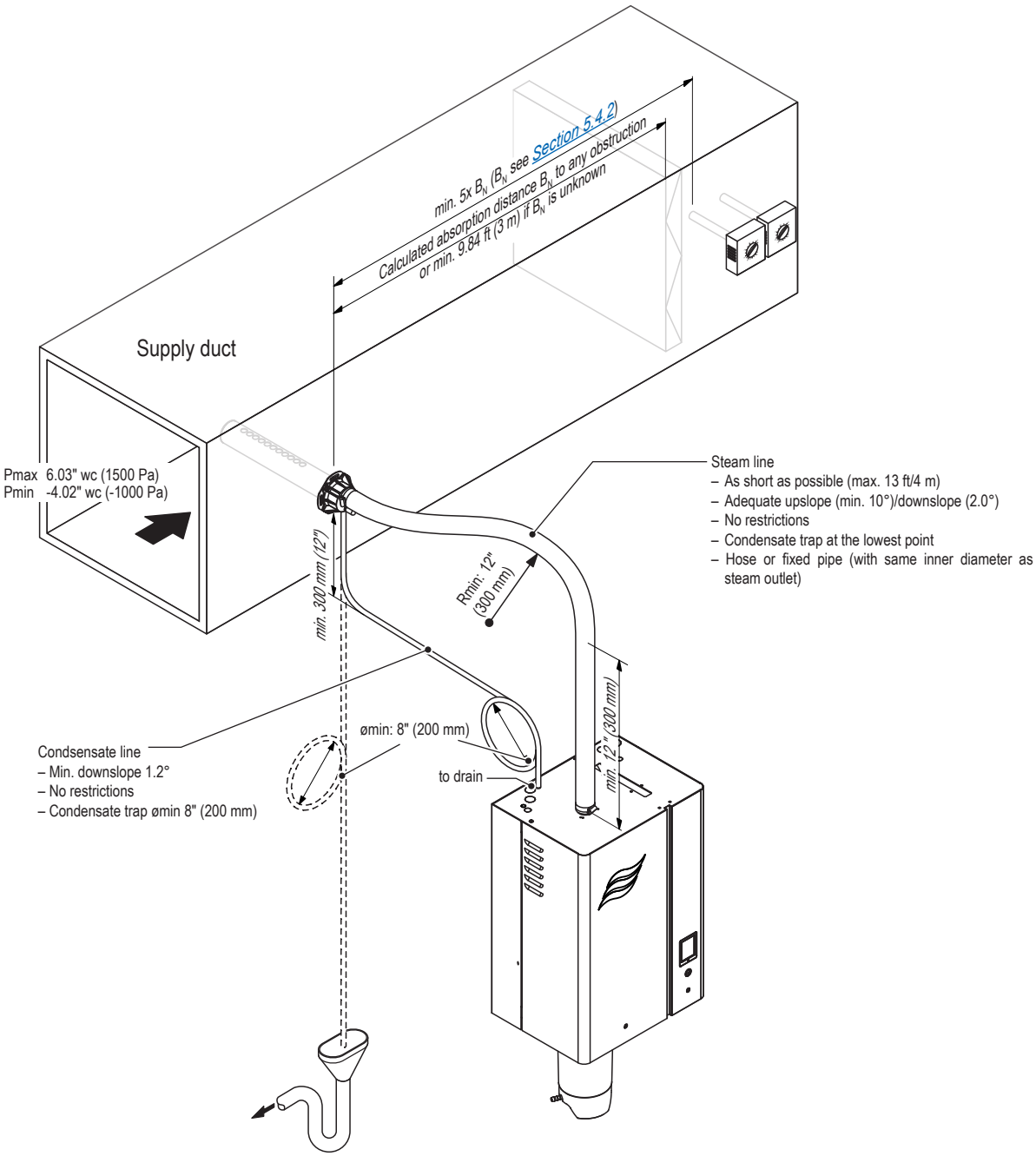


Fig. 12: Overview steam installation for duct humidification

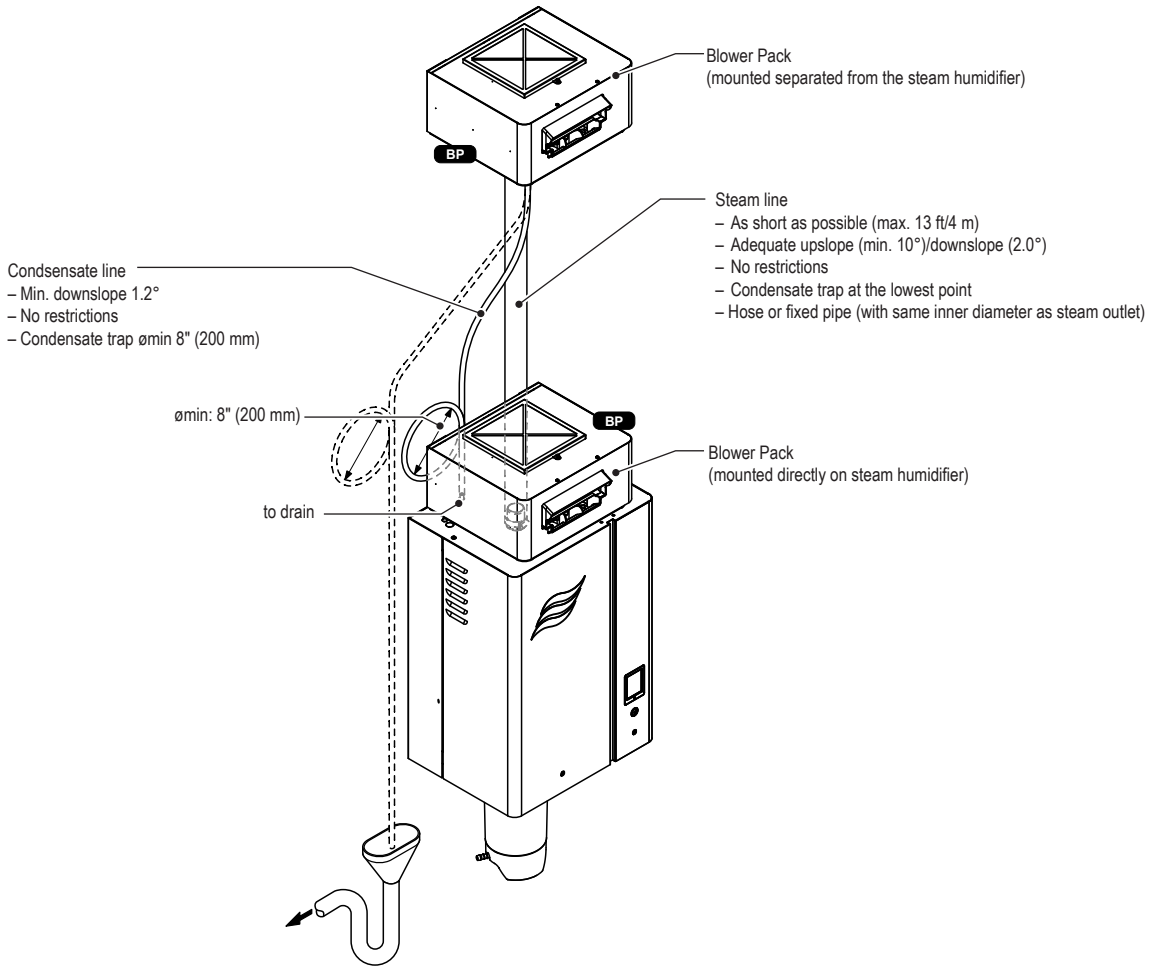


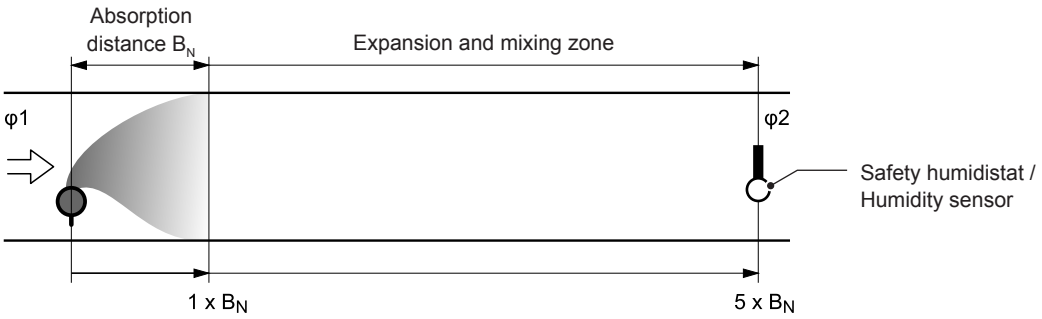
Fig. 13: Overview steam for room humidification

5.4.2 Positioning of the steam distributor

The location of the steam distributor should be determined at the time of dimensioning the air conditioning system. Please note the following instructions to ensure proper humidification of the duct air.

Calculating the absorption distance

The steam, emitting from the steam distributor, requires a certain distance to be absorbed by the air so that it is no longer visible as steam. This distance is referred to as **absorption distance "B_N"** and serves as a basis for the determination of the minimum distances from the upstream components in the system



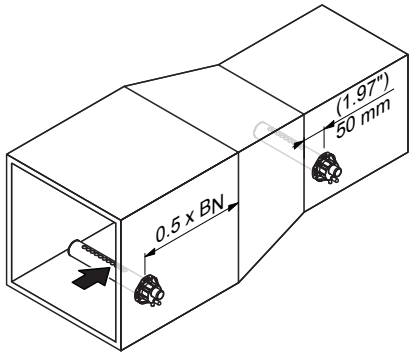
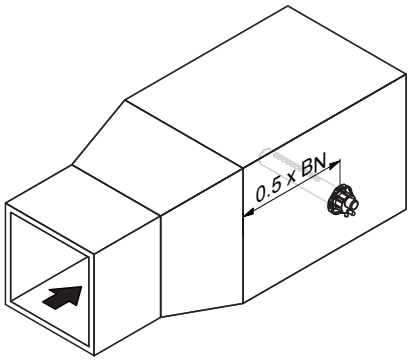
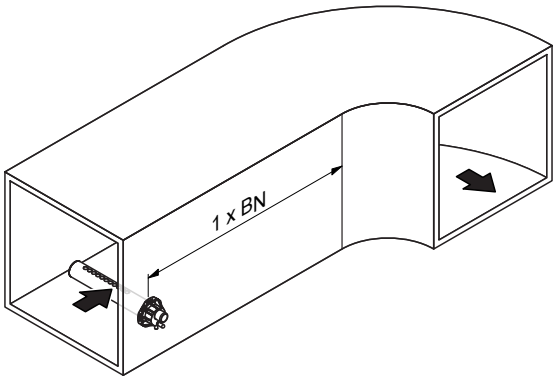
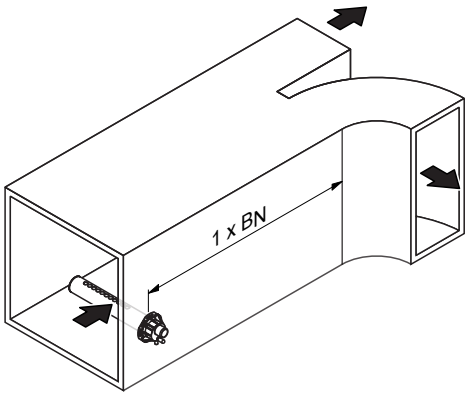
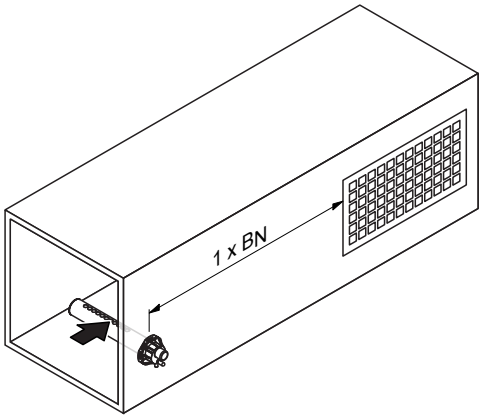
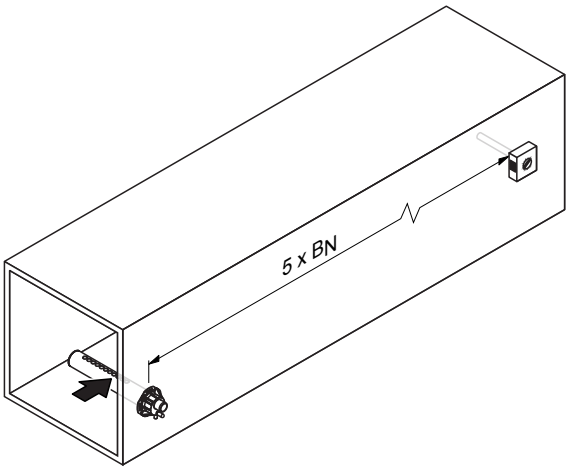
φ1: Supply air humidity **before** humidification
φ2: Supply air humidity **after** humidification

Fig. 14: Absorption distance "B_N"

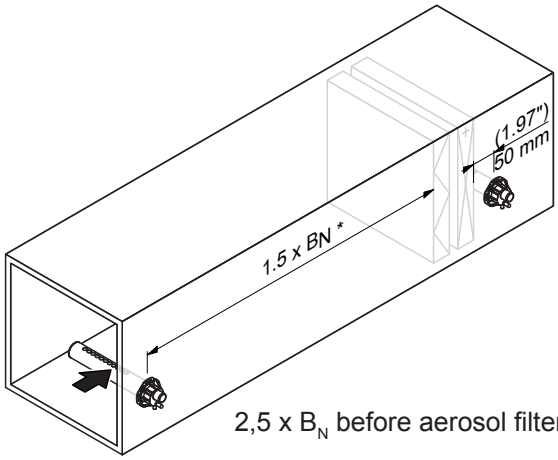
The calculation of the absorption distance "B_N" is dependent on several factors. Use Condair HELP to calculate the absorption distance for your particular project.

Minimum distances to be observed

To prevent the steam, that is emitting from the steam distributor, from condensing on downstream system components, a minimum distance to the steam distributor must be observed (depends on the absorption distance "B_N").

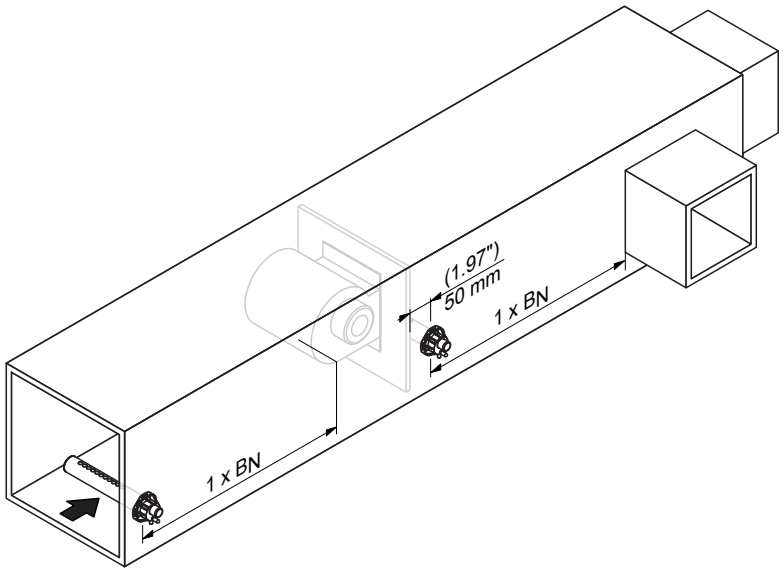
before/after constriction	after expansion
	
before bend	**before branch**
	
before diffuser	**before humidity controller/ humidity sensor**
	

before/after filter/heater



2,5 x B_N before aerosol filter

before/after fan, zone exit

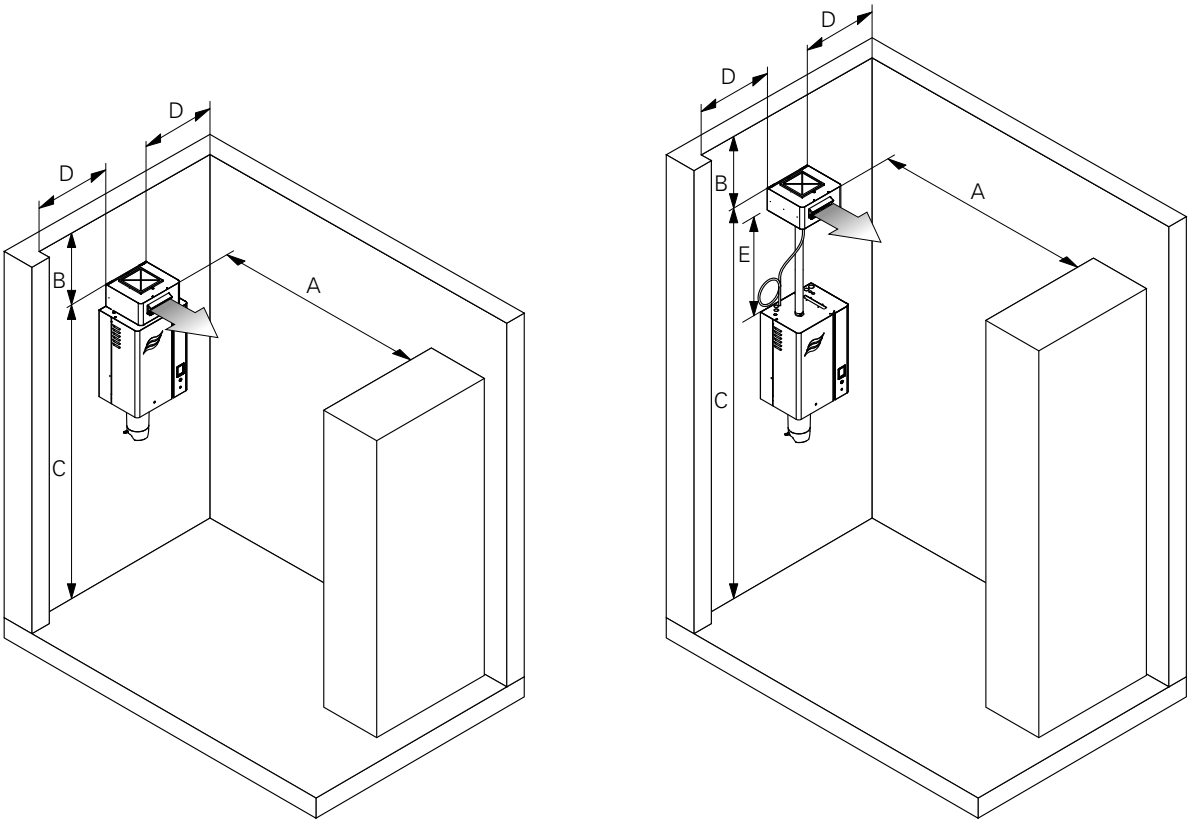


5.4.3 Installing the steam distributors

Detailed information on the installation of steam distribution pipes and SAM-e steam distribution system can be found in the separate mounting instructions for these products.

5.4.4 Positioning and mounting of the blower packs (accessory BP)

The blower packs can either be mounted directly on the humidifier or separately above the humidifier to the wall. To allow the steam coming from the blower pack to spread out evenly, without condensing on obstacles (ceilings, joists, pillars, etc.), the following minimum dimensions must be observed when selecting the location for the blower pack.



	BP-Series blower pack						
Capacity	**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" (min.)	9" (0.23 m)	18" (0.46 m)	75" (1.91 m)	86" (2.19 m)	174" (4.42 m)	189" (4.81 m)	248" (6.30 m)
Dimension "B" (min.)	12" (0.31 m)					48" (1.22 m)	84" (2.14 m)
High Speed							
Dimension "A" (min.)	6" (0.16 m)		60" (1.53 m)	71" (1.81 m)	132" (3.36 m)	153" (3.89 m)	218" (5.54 m)
Dimension "B" (min.)	12" (0.31 m)						
Dimension "C" (approx.)	90" (2.3 m)						
Dimension "D" (approx.)	12" (0.31 m)					30" (0.77 m)	
Dimension "E" (min.)	39.5" (1.0 m)						
Dimension "E" (max.)	158" (4.0 m) – Condair recommends 79" (2.0 m)						

The values in the table above are based on the following nominal conditions: 72 °F (22 ˚C), 40% RH. The 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.

Note: In order to achieve a uniform distribution of the humidity within the room, additional factors such as the room size, the room height, etc., must be taken into consideration besides observing the minimum distances for the blower packs. If you have questions concerning the direct room humidification, please contact your Condair representative.

Further information is provided in the separate installation and operating instructions for the corresponding blower pack.

5.4.5 Installing the steam and condensate lines

Installations notes

– Use **original steam and condensate hose** from your Condair representative or **solid steam pipes from copper (MED-L) or stainless steel (min. AISI 304) exclusively**. Steam and condensate lines from other material may cause undesired operational malfunctions.

– Initially, lead the steam line **upright upwards min. 12" (300 mm) above the humidifier**. Then lead the steam line with a **minimum upslope of 10°** and a **minimum downslope of of 2°** to the steam distributor.

– The condensate hose from the steam distributor is led down to the humidifier with a **minimum downslope of 1.2°**, via a condensate trap (**min. hose bend diameter Ø8" (ø200 mm))** and there it is to be connected to the appropriate connector on top of the unit.
Important! Before putting the unit into operation, the condensate trap of the condensate hose must be filled with water.

– The steam line should be kept as short as possible (**max. 13 ft** (4 m)) while observing the **minimum bend radius of 12"** (300 mm) (for steam hoses) or **5 x internal diameter** (with solid steam pipes), respectively.
Important! Allowance must be made for a **pressure loss** from elbows, according to equivalent length tables.

– **Important!** When deciding on the length and layout of steam hoses, it should be noted that steam hoses may become shorter and/or longer depending on temperature and age.

– The steam hose must be secured to the steam distributor and humidifier steam outlet by means of **hose clamps**. Solid steam pipes should be connected to the steam distributor and steam humidifier with short lengths of steam hose secured with hose clamps.
Caution! Do not overtighten the hose clamp on the steam connector of the steam humidifier.

– Steam lines made of solid pipes (copper or stainless steel) must be insulated over the entire length to minimize condensate formation (=loss).

DANGER!

Reducing the cross section or the complete closure of the steam line will cause an excessive increase in pressure in the steam cylinder when the unit is operating and could lead to the risk of scalding accidents. All installations must comply with the following instructions.

– When installing make sure the steam line is open over the entire length and through the whole cross section. Any sealing plugs, adhesive sealing sheets etc. must be removed before connecting the steam pipe. Reductions in cross section by kinking or crushing must be avoided.

– Steam hoses must be prevented from sagging (condensate pockets); if necessary, support steam hose with pipe clamps, trough, or wall brackets, and install a condensate drain at any low points in the steam line.

– It is **not permitted to install a stop valve** (e.g. a manually controlled stop valve, solenoid valve, etc.) in the steam line, due to an inadmissible increase of pressure in the steam cylinder if the valve is closed during the operation.

Installation examples

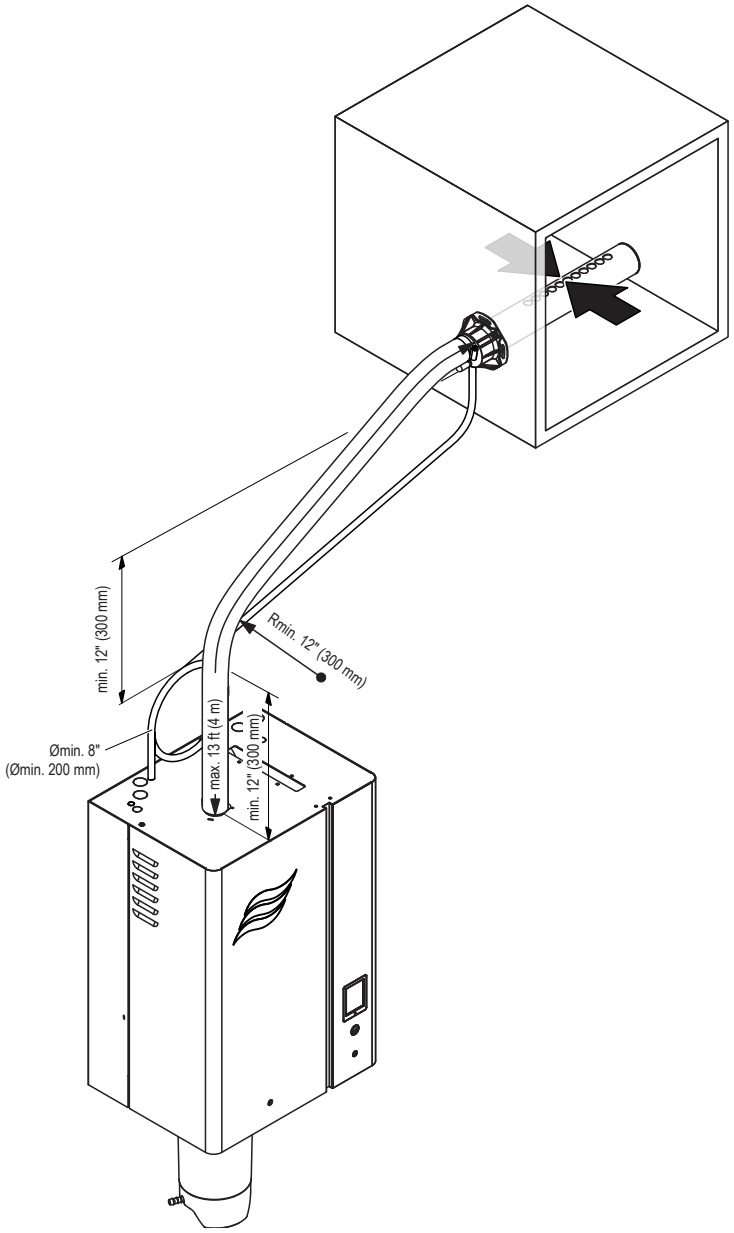


Fig. 15: Steam distributor mounted more than 20" (500 mm) above the top edge of the humidifier

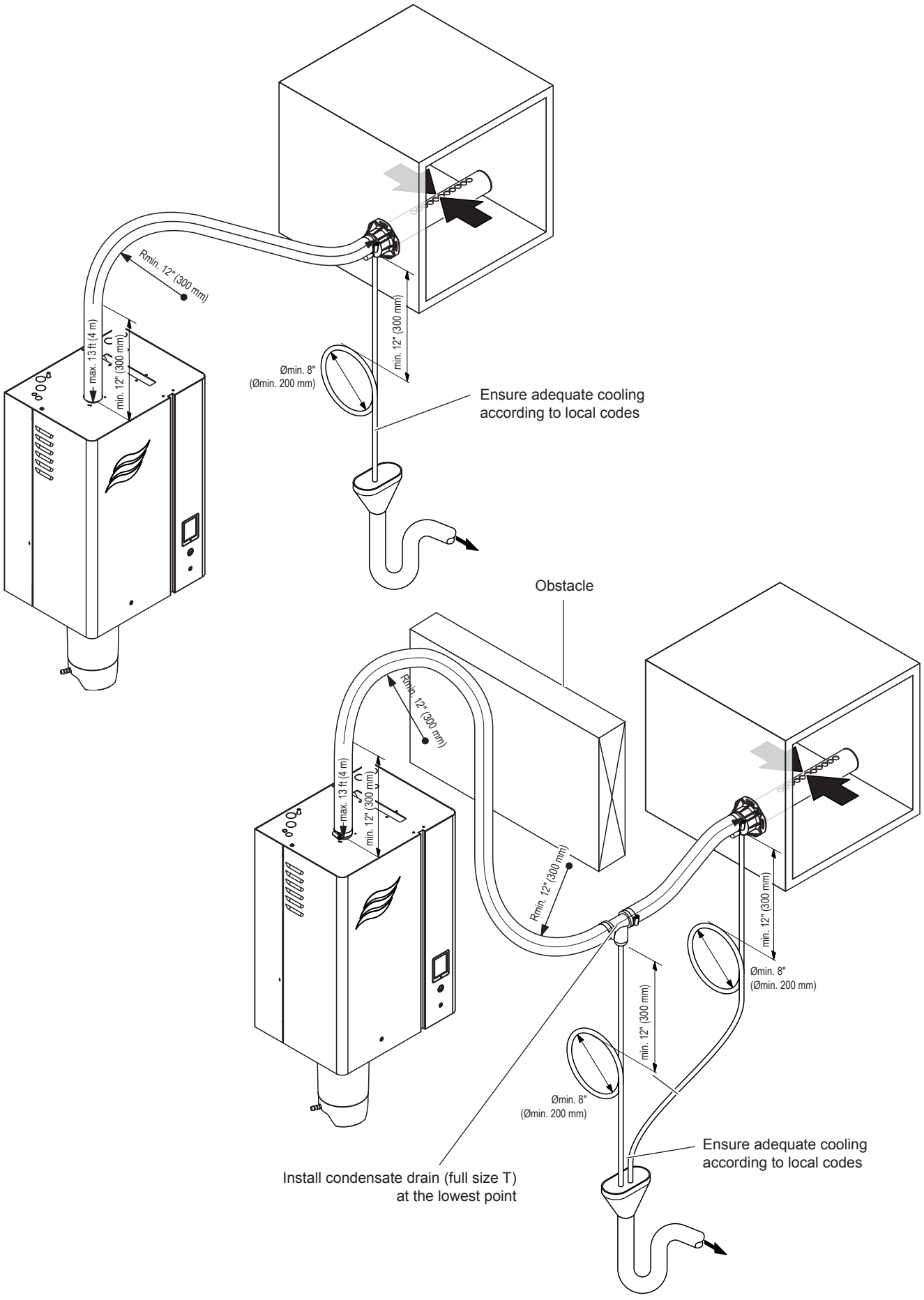


Fig. 16: Steam distributor mounted less than 20" (500 mm) above the top edge of the humidifier

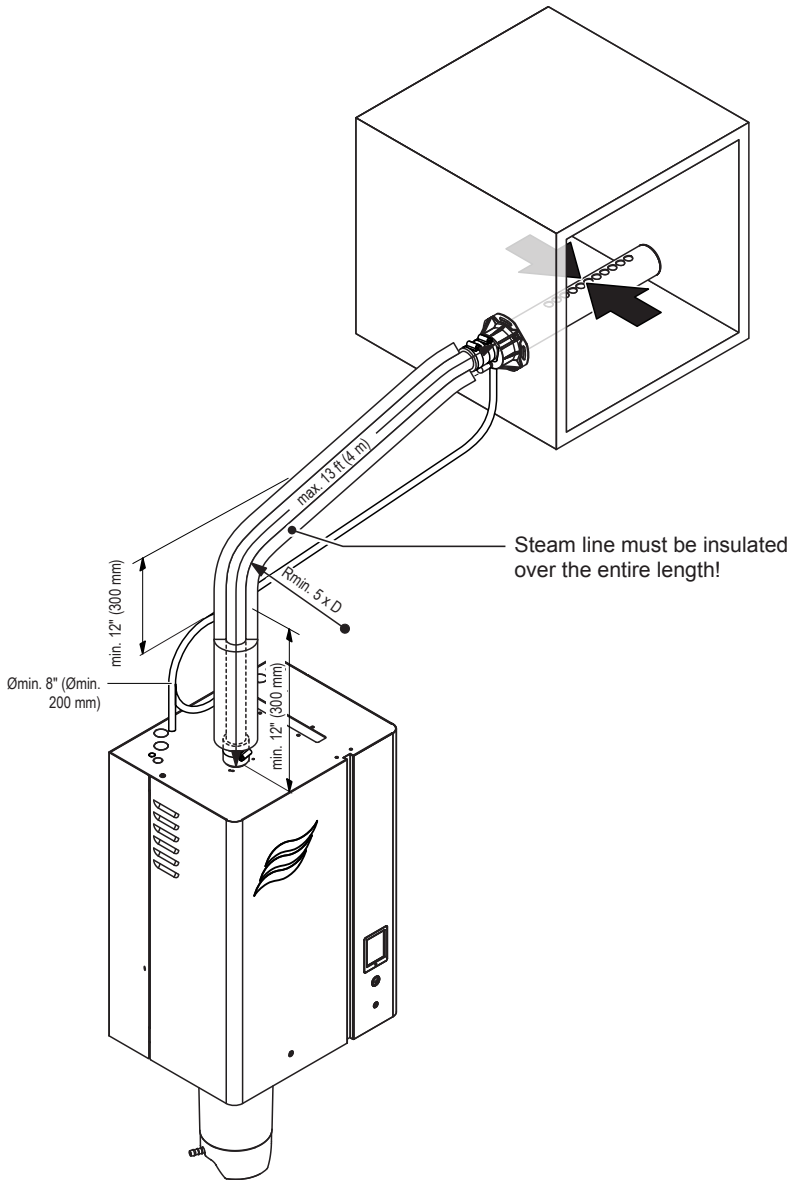
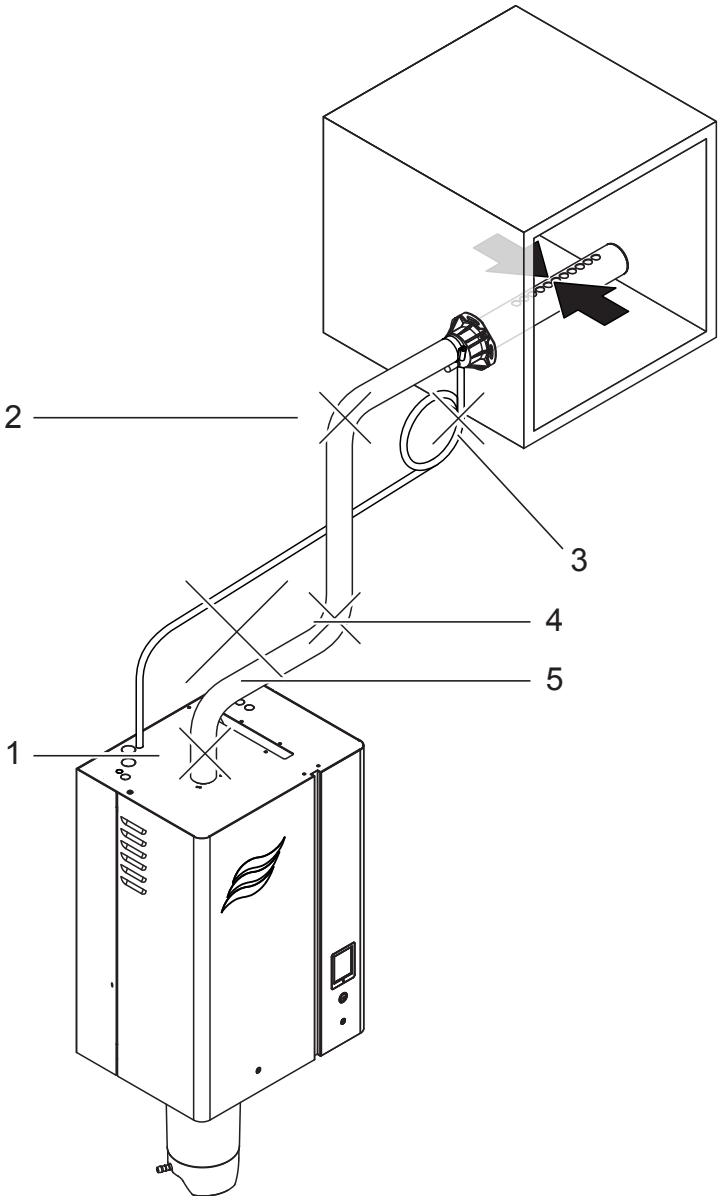


Fig. 17: Steam line with solid piping and insulation

5.4.6 Common steam and condensate line errors



	Wrong	Correct
1	Steam line not led at least 12" (300 mm) perpendicularly upwards before first bend (forming of condensate).	Lead steam line at least 12" (300 mm) perpendicularly upwards before first bend.
2	Minimum bend radius of steam hose/solid steam line not maintained (forming of condensate).	The minimum bend radius of 12" (300 mm) for steam hoses or 5 times steam line internal diameter for solid steam lines must be maintained.
3	Condensate trap not sufficiently high and installed too near at the steam distributor.	The condensate trap must be at least 12" (300 mm) below the connector on the steam distributor and it must have a minimum height of ø8" (ø200 mm).
4	No condensate trap installed at vertical transition.	Install condensate trap at all low points and before vertical transitions.
5	Steam line and condensate hose not sloped (slope min. 20 %).	Install steam line always with constant upslope of min. 10° or downslope of min. 2.0° and condensate hose with constant downslope of min. 1.2°.

Fig. 1: Common steam and condensate line errors

5.5 Inspecting the steam installation

Use the following check list to ensure that the steam installation was performed correctly:

– Steam distributor
  - ☐ Steam distributors (steam distribution pipe or SAM-e steam distribution system) correctly positioned and secured (screws tightened)?
  - ☐ Are the outlet orifices at right angles to the air flow for horizontal installation, or at 45 degree angle for vertical installation?

– Steam hose
  - ☐ Maximum length of 13 ft (4 m)?
  - ☐ Minimum bend radius of 12" (300 mm) (5 x internal diameter with fixed piping)?
  - ☐ Upslope of min. 10° and downslope of min. 2° maintained?
  - ☐ Have the instructions for hose layout been followed?
  - ☐ Steam hose: no sagging (condensate pocket) or condensate drain with trap (hose bend with a minimum diameter of 12" (300 mm)) installed at the lowest point?
  - ☐ Fixed steam lines: properly insulated? Correct installation material used? Minimum internal diameter maintained?
  - ☐ Steam hose or steam hose pieces securely attached with clamps?
  - ☐ Heat expansion during operation and shortening of the hose with ageing taken into consideration?

– Condensate hose
  - ☐ Downslope of at least 1.2°?
  - ☐ Trap (min. ø8" (ø200 mm)) in place and filled with water?
  - ☐ Condensate hose correctly connected and supported and not kinked?

5.6 Water installation

5.6.1 Overviews water installation

Note: with RS-RO Option installed see *Section 5.6.2*.

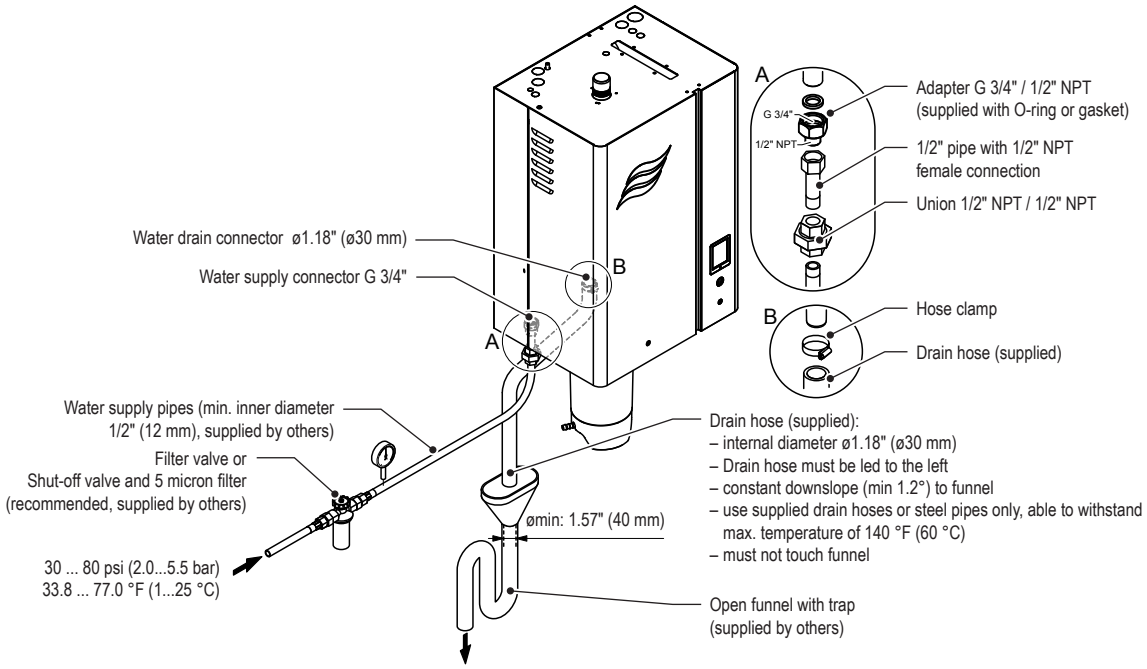


Fig. 18: Overview water installation for single units Small and Medium

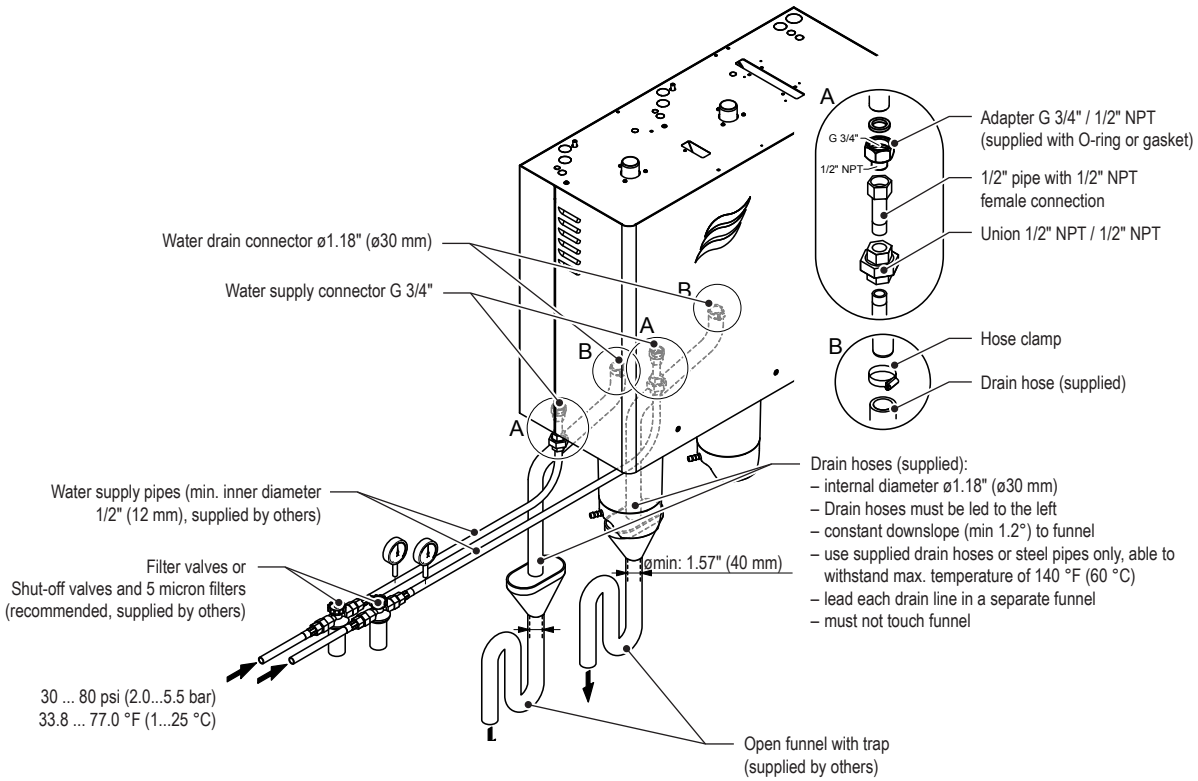


Fig. 19: Overview water installation for single units Large

5.6.2 Overviews water installation (with RS-RO option installed)

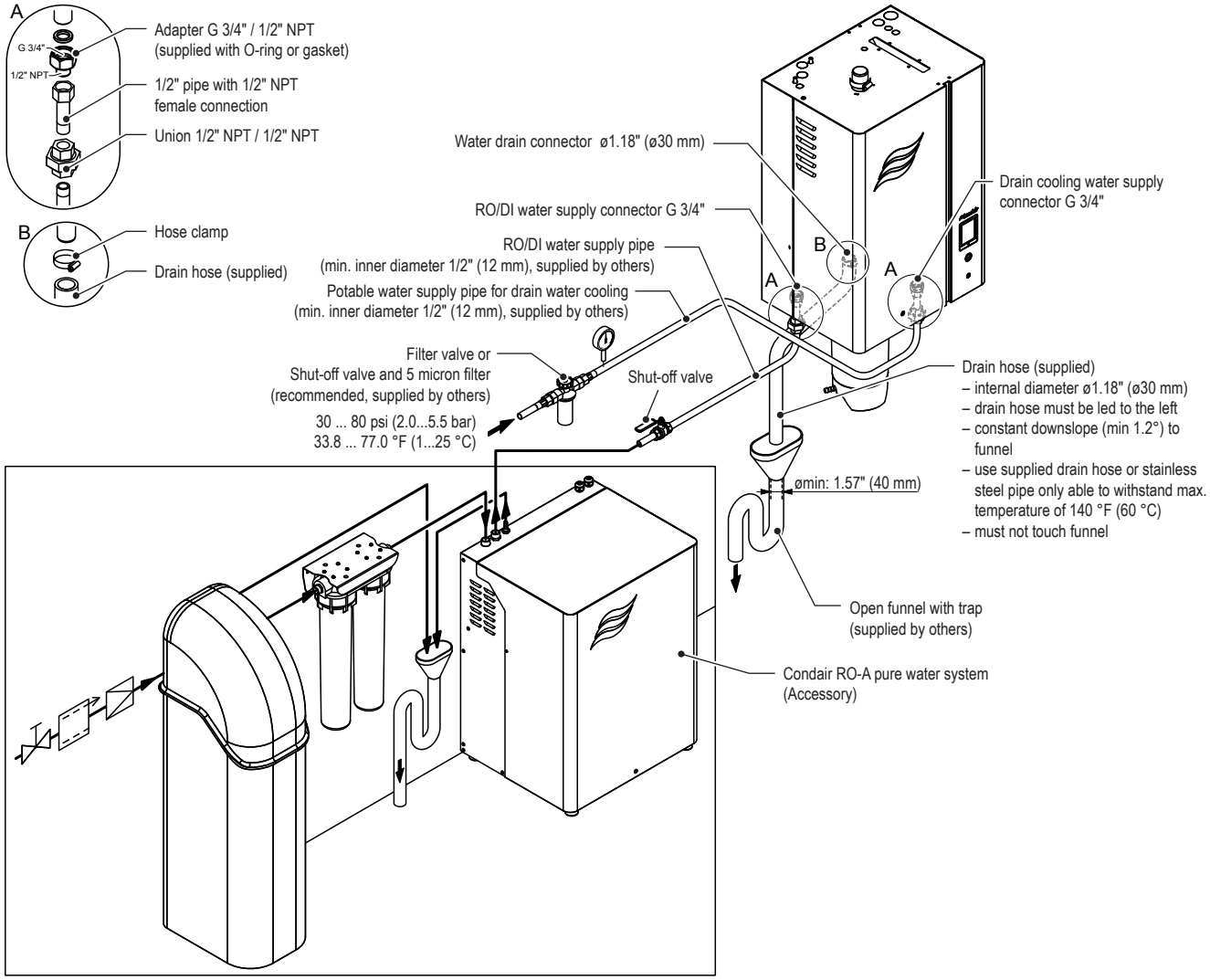


Fig. 20: Overview water installation for single units Small and Medium (with RS-RO option installed)

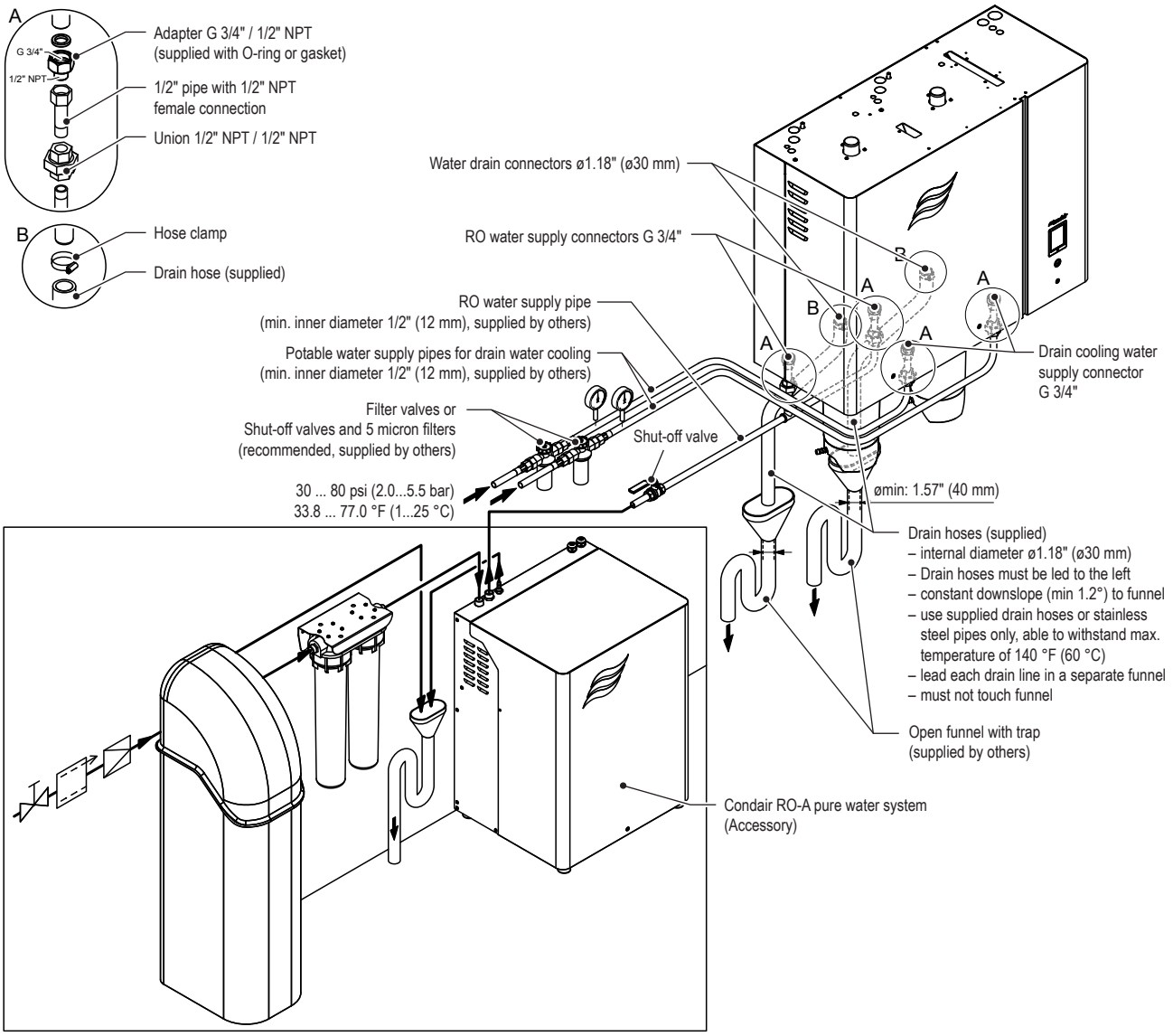


Fig. 21: Overview water installation for single units Large (with RS-RO option installed)

5.6.3 Notes on water installation

5.6.3.1 Water supply (Potable, RO or DI water)

The water supply is to be carried out according to *Fig. 18* and *Fig. 19* **or** *Fig. 20* and *Fig. 21* and the applicable local regulations for water installations. The indicated connection specifications must be observed.

– The installation of a **filter valve** (alternatively a shut-off valve and a 5 micron water filter can be used) should be made as close as possible to the steam humidifier.

– Admissible mains pressure **30 ... 80 psi (2.1...5.5 bar)**
For mains pressures > 145.0 psi (>10 bar), the connection must be made via a pressure reducing valve (adjusted to 30.0 psi (2.1 bar)). For mains pressures <30.0 psi (2.1 bar) please contact your Condair supplier.

Note: The water supply system must be free of pressure bumps (**hammer-free**). The installation of a check valve in the water supply line is therefore not permitted, as this can lead to pressure bumps in the water system and damage the inlet valve. If a pipe disconnector is to be installed in the inlet water system, a model with overpressure protection must be installed. If water hammers cannot be avoided in the supply line, a pressure shock absorber must be installed.

– Supply rates:

RS	Max. fill rates
Small	3.70 gal/min (14 l/min)
Medium	3.70 gal/min (14 l/min)
Large	2 x 3.70 gal/min (2 x 14 l/min)

– **Notes on water quality**:
  – For the water supply of the Nortec RS, use exclusively **potable drinking water in accordance with the applicable local regulations** or water from a RO system or de-ionized water system.
  – The use of **additives** such as corrosion inhibitors, disinfectants, etc. is **not allowed**, since these additives may endanger health and affect proper operation.
– The connection material must be **pressure-proof** and **certified for use in drinking water systems**. When connected to a RO or DI water source, use only installation materials that are acceptable for the treated water.
– **Important!** Before connecting the water line(s)**, the line(s) must be well flushed out**.

CAUTION!

The thread at the humidifier connection is made of plastic. To avoid overtightening, the adapter and the union nut of the water pipe must be **tightened by hand** only.

5.6.3.2 Additional requirements for RS-RO option water supply

With the RS-RO option installed the water supply and the drain cooling water supply are to be carried out according to *Fig. 20* and *Fig. 21* and the applicable local regulations for water installations. The indicated connection specifications must be observed.

– **RO water supply:**
  – The RO water supply must be connected to the inlet connector(s) according to *Fig. 20* and *Fig. 21*. Use only installation material that is approved for RO or DI water to connect the RO-A pure water system to the Nortec RS. All water supply requirements outlined in *Section 5.6.3.1* must also be adhered to with the RO or DI water supply.
    Note: Detailed information regarding the installation of the RO-A pure water system can be found in the separate installation and operation manual of the Condair RO-A.
– **Drain cooling water supply:**

  The seperate drain cooling water supply must be connected to the optional drain water cooling inlet valve(s) provided with the RS-RO option according to *Fig. 20* and *Fig. 21*. Please observe the following notes regarding the drain cooling water supply installation.

  – Admissible mains pressure **30 ... 80 psi (2.1...5.5 bar)**
    For mains pressures > 145.0 psi (>10 bar), the connection must be made via a pressure reducing valve (adjusted to 30.0 psi (2.1 bar)). For mains pressures <30.0 psi (2.1 bar) please contact your Condair supplier.

    Note: The water supply system must be free of pressure bumps (**hammer-free**). The installation of a check valve in the water supply line is therefore not permitted, as this can lead to pressure bumps in the water system and damage the inlet valve. If a pipe disconnector is to be installed in the inlet water system, a model with overpressure protection must be installed. If water hammers cannot be avoided in the supply line, a pressure shock absorber must be installed.

– Supply rates:

RS with RS-RO option	Max. fill rates	
	Inlet RO	Drain water cooling (potable)
Small	0.32 gal/min (1.2 l/min)	3.70 gal/min (14 l/min)
Medium	0.53 gal/min (2 l/min)	3.70 gal/min (14 l/min)
Large	2 x 0.53 gal/min (2 x 2 l/min)	2 x 3.70 gal/min (2 x 14 l/min)

– **Notes on water quality**:
  – For the drain cooling water supply, use exclusively **potable drinking water in accordance with the applicable local regulations**.
  – The use of **additives** such as corrosion inhibitors, disinfectants, etc. is **not allowed**.
– The connection material must be **pressure-proof** and **certified for use in drinking water systems**.
– **Important!** Before connecting the water line**, the line must be well flushed out**.

CAUTION!

The thread at the humidifier connection(s) is/are made of plastic. To avoid overtightening, the adapter(s) and the union nut(s) of the water pipe must be **tightened by hand** only.

5.6.3.3 Water drain

The water drain is to be carried out according to the figures found in *Section 5.6.1* and the applicable local regulations for water installations. The indicated connection specifications must be observed.

– Draining rate: approx. 0.66 gal/min (2.5 l/min) per 33.07 lbs/hr (15 kg/h) steam capacity
– The draining temperature is 140 °F (60°C) or less. Use temperature-resistant installation materials only!
– When operating the Nortec RS with RO water use only installation material that is approved for RO water.
– Make sure that the drain pipes, the funnel(s) and the siphon(s) are correctly fixed and easily accessible for inspections and cleaning purposes.
– Always lead the supplied drain hose from the connector to the left down to the funnel (see *Fig. 18*).

  On large units with two steam cylinders each drain line must be led into a separate funnel with trap (see *Fig. 19*).
– Attach drain line(s) in such a way, that it/they cannot slip out of the funnel(s) and that it/they cannot bottom out in the funnel(s).
– The open end of the drain line(s) must not touch the funnel(s) (min. air gap 1" (2.5 cm)).

5.6.4 Inspecting the water installation

Check the following topics:

– Water supply
  ☐ Has filter valve or shut-off valve and 5 µm water filter respectively been installed in supply line to each unit module?
  ☐ Has acceptable water pressure (30 ... 80 psi (2.1...5.5 bar)) and acceptable water temperature 33.8 ... 77.0 °F (1...25 °C)) been connected?

- ☐ Does the water supply capacity match the humidifier and is the minimum inside diameter of the supply pipe maintained throughout the entire length (min. internal diameter of 1/2" (12 mm) for systems with optional drain water cooling recommended)?
- ☐ Are all components and pipes properly secured and are all threaded connections securely tightened?
- ☐ Is the water system properly sealed?
- ☐ Does the water supply installation meet the requirements of the local regulations for water installations?
- ☐ For RO or DI water supply: Has installation material been approved for use with treated water?

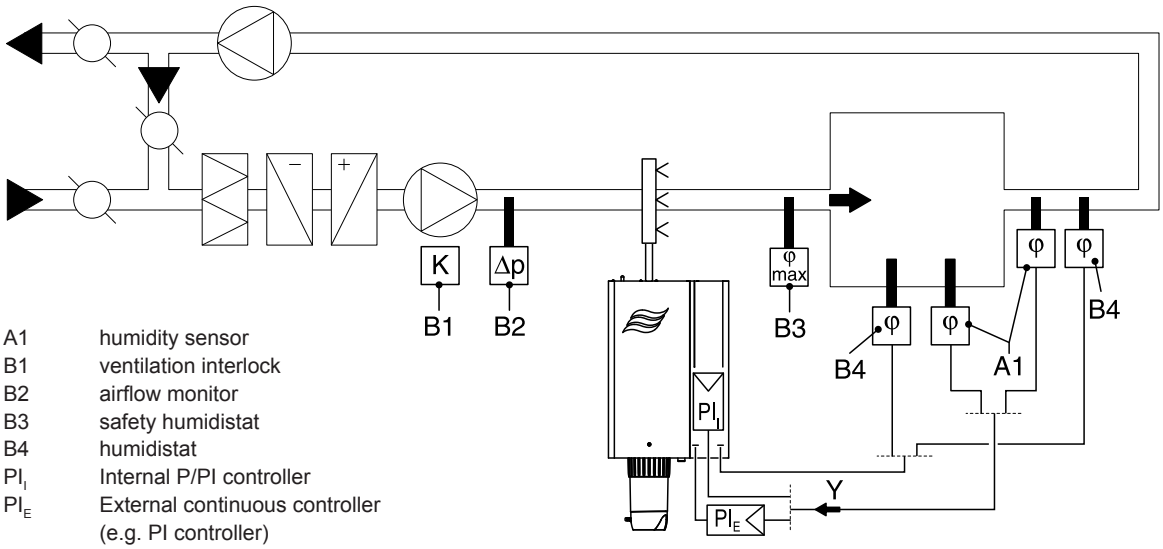
– Water supply (with RS-RO option installed)
  – RO water supply:
    - ☐ Has RO-A pure water system been installed according to the notes in the separate Condair RO-A installation and operation manual.
    - ☐ Has RO water supply been connected to the water inlet connector according to *Fig. 20* and *Fig. 21* and has installation material been used approved for use with RO water?
  – Drain cooling water supply (potable drinking water):
    - ☐ Has filter valve or shut-off valve and 5 µm water filter respectively been installed in supply line to each unit module?
    - ☐ Has acceptable water pressure (30 ... 80 psi (2.1...5.5 bar)) and acceptable water temperature 33.8 ... 77.0 °F (1...25 °C)) been connected?
    - ☐ Does the drain cooling water supply capacity match the humidifier and is the minimum inside diameter of the supply pipe maintained throughout the entire length (min. internal diameter of 12 mm for systems with optional drain water cooling recommended)?
    - ☐ Are all components and pipes properly secured and are all threaded connections securely tightened?
    - ☐ Is the drain cooling water system properly sealed?
    - ☐ Does the drain cooling water supply installation meet the requirements of the local regulations for water installations?

– Water drain
  - ☐ Is the minimum inside diameter of the drain pipe(s) of ø1.18" (30 mm) maintained throughout the entire length?
  - ☐ Has/have drain pipe(s) been installed with a downslope of at least 1.2°?
  - ☐ Has the heat resistance of the material used been verified to be at least 212 °F/100 °C (140 °F/60 °C for systems with optional drain water cooling)?
  - ☐ If Nortec RS is operated with RO or DI water: Has installation material been used approved for the treated water?
  - ☐ Is/are the drain hose(s) properly secured (hose clamps at unit connection tightened)?
  - ☐ Is there an air gap (min. 1" (2.5 cm)) between the open end of the drain line and the funnel?
  - ☐ Does the water drain installation meet the requirements of the local regulations for water installations?

5.7 Notes on humidity control systems/humidity control

5.7.1 System 1 – Room humidity control

System 1 is suited for **direct room humidification** and **air conditioning systems with mainly recirculated air**. The humidity sensor or humidistat respectively is preferably located in the room itself or in the exhaust air duct.

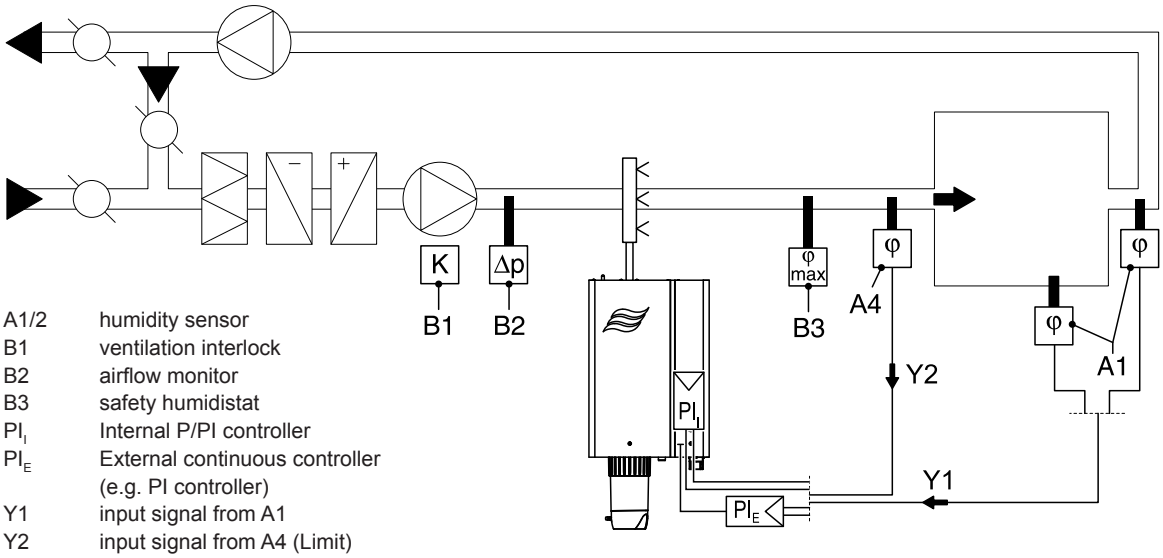


A1	humidity sensor
B1	ventilation interlock
B2	airflow monitor
B3	safety humidistat
B4	humidistat
PI_I	Internal P/PI controller
PI_E	External continuous controller (e.g. PI controller)
Y	input signal from A1

Fig. 22: System 1 – Room humidity control

5.7.2 System 2 – Room humidity control with continuous limitation of the supply air humidity

System 2 is suited for air conditioning systems with a **large portion of supply air**, **low supply air temperature**, **post-humidification**, or **variable airflow volume**. If the supply air humidity exceeds the preset value, the continuous limitation is effected prior to the room humidity control.
The humidity sensor (A1) is preferably located in the exhaust air duct or in the room itself. The humidity sensor (A2) for the limitation of the supply air humidity is located in the supply air duct after the steam distribution pipe. This control system requires a continuous controller with the option to connect a second humidity sensor.
Attention! The continuous limitation of the supply air humidity is no substitute for the safety humidistat.

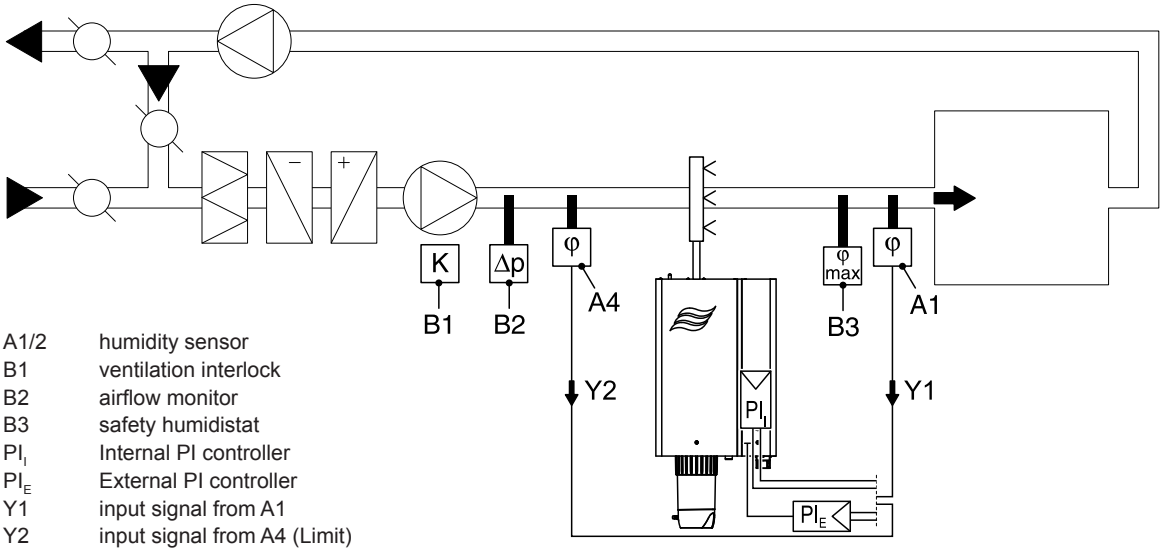


A1/2	humidity sensor
B1	ventilation interlock
B2	airflow monitor
B3	safety humidistat
PI_I	Internal P/PI controller
PI_E	External continuous controller (e.g. PI controller)
Y1	input signal from A1
Y2	input signal from A4 (Limit)

Fig. 23: System 2 – Room humidity control with continuous limitation of the supply air humidity

5.7.3 System 3 – Supply air humidity control with continuous output limitation

Supply air humidity control (humidity sensor installed in supply air duct) should be used only where room humidity control is impracticable for technical reasons. Such systems always require a PI-controller.
The humidity sensor (A1) is located in the supply air duct after the steam distribution pipe. The humidity sensor (A2) for the continuous output limitation is located in the supply air duct before the steam distribution pipe. Such a system requires a PI-controller with the option to connect a second humidity sensor.



A1/2	humidity sensor
B1	ventilation interlock
B2	airflow monitor
B3	safety humidistat
PI_I	Internal PI controller
PI_E	External PI controller
Y1	input signal from A1
Y2	input signal from A4 (Limit)

Fig. 24: System 3 – Supply air humidity control with continuous output limitation

5.7.4 Which humidity control system for which application

Application	**Location of the humidity sensor**	
	room or exhaust air duct	**supply air duct**
Air conditioning systems with:		
– supply air portion up to 33%	System 1	System 1
– supply air portion up to 66%	System 1 or 2	System 2 or 3
– supply air portion up to 100%	System 2	System 3
– supply air humidity control	—	System 3
Direct room humidification	System 1	—

Please contact your Condair supplier, if your application meets the following conditions:
– Humidification of small rooms up to 7060 ft^3 (200 m^3)
– Air conditioning systems with a high number of air exchanges
– Systems with variable air volume flow
– Test facilities with extreme control accuracy requirements
– Rooms with a high variation in max. steam capacity
– Systems with temperature fluctuations
– Cold rooms and systems with dehumidification

5.7.5 Admissible control signals

Control with external controller Control signals	Control with internal PI controller Humidity sensor signals
0...5 VDC	0...5 VDC
1...5 VDC	1...5 VDC
0...10 VDC (Potentiometer 140 Ω ... 10 kΩ)	0...10 VDC (Potentiometer 140 Ω ... 10 kΩ)
2...10 VDC	2...10 VDC
0...20 VDC	0...20 VDC
0...16 VDC	0...16 VDC
3.2...16 VDC	3.2...16 VDC
0 ... 20 mA	0 ... 20 mA
4 ... 20 mA	4 ... 20 mA
Humidistat (24 V On/Off)	

5.8 Electrical installation

5.8.1 Notes on electrical installation

DANGER!
Danger of electric shock

The Nortec RS is mains powered. Live parts may be exposed when the unit is open. Touching live parts may cause severe injury or danger to life.

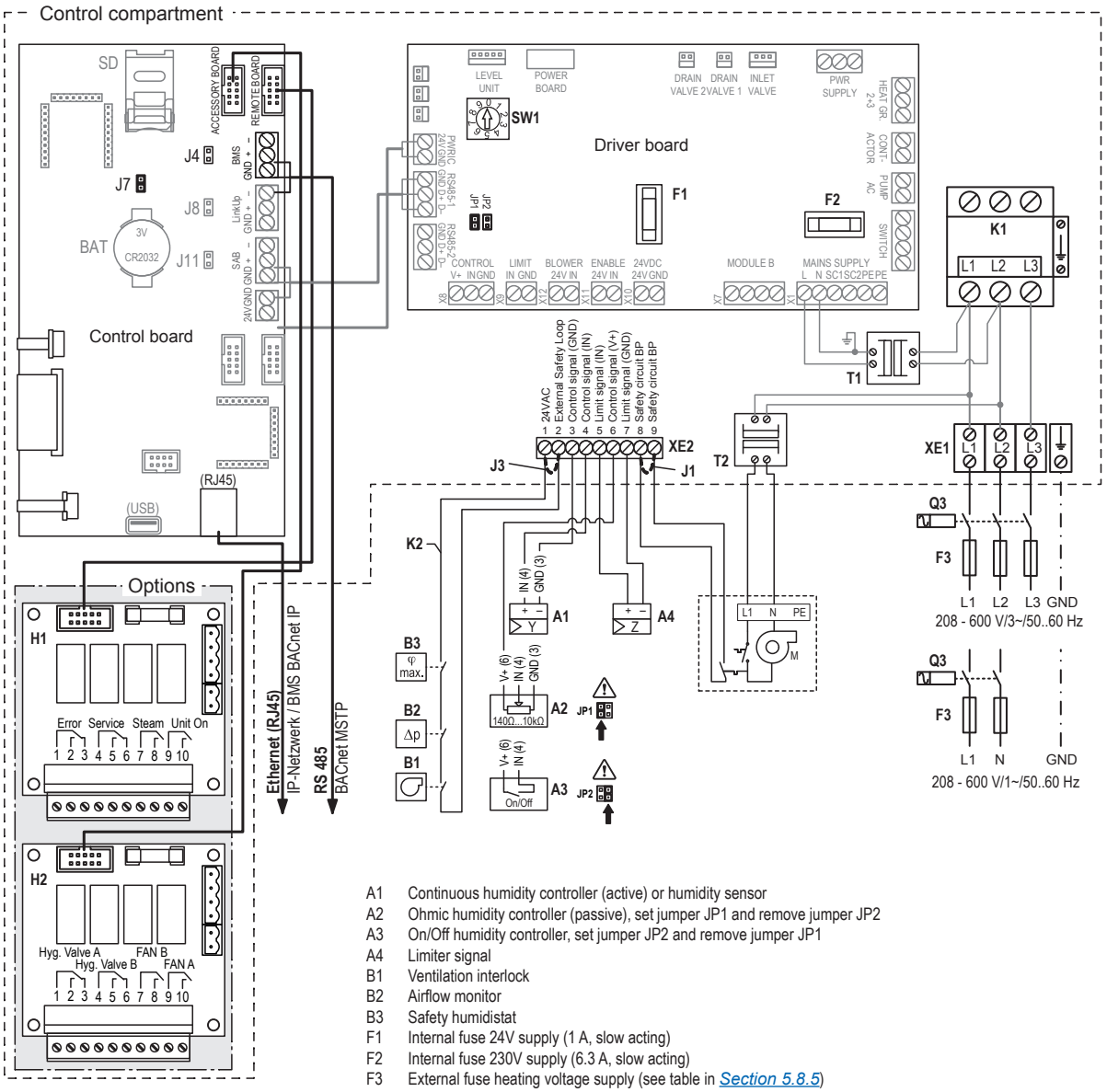
Prevention: The Nortec RS unit must be connected to the mains only after all mounting and installation work has been completed, all installations have been checked for correct workmanship and the unit is closed and properly locked.

CAUTION!

The electronic components inside the unit are very sensitive to electrostatic discharge. Before carrying out installations work inside the unit, appropriate measures must be taken to protect the electronic components against damage caused by electrostatic discharge (ESD protection).

- All work concerning the electrical installation must be performed only by **skilled and qualified technical personnel (e.g. electrician with appropriate training) authorised by the owner.** It is the owner's responsibility to verify proper qualification of the personnel.
- The electrical installation must be carried out according to the corresponding wiring diagram (see *Sections 5.8.2* and *5.8.3*), the notes on electrical installation as well as the applicable local regulations. All information given in the wiring diagrams and notes must be followed and observed.
- All cables must be lead into the unit, via appropriate cable strain relief or grommets. The cable for the heating voltage supply must be lead into the unit from the bottom via the cable opening equipped with the clamp. Fix the cable with the clamp strap.
- Make sure the cables are adequately clamped, do not rub on any components or become a tripping hazard.
- Observe and maintain maximum cable length and required cross section per wire according to local regulations.
- The mains supply voltages (heating and control voltage supply) must match the respective voltage stated on the specification label.

5.8.2 Wiring diagram Nortec RS - Small and Medium units

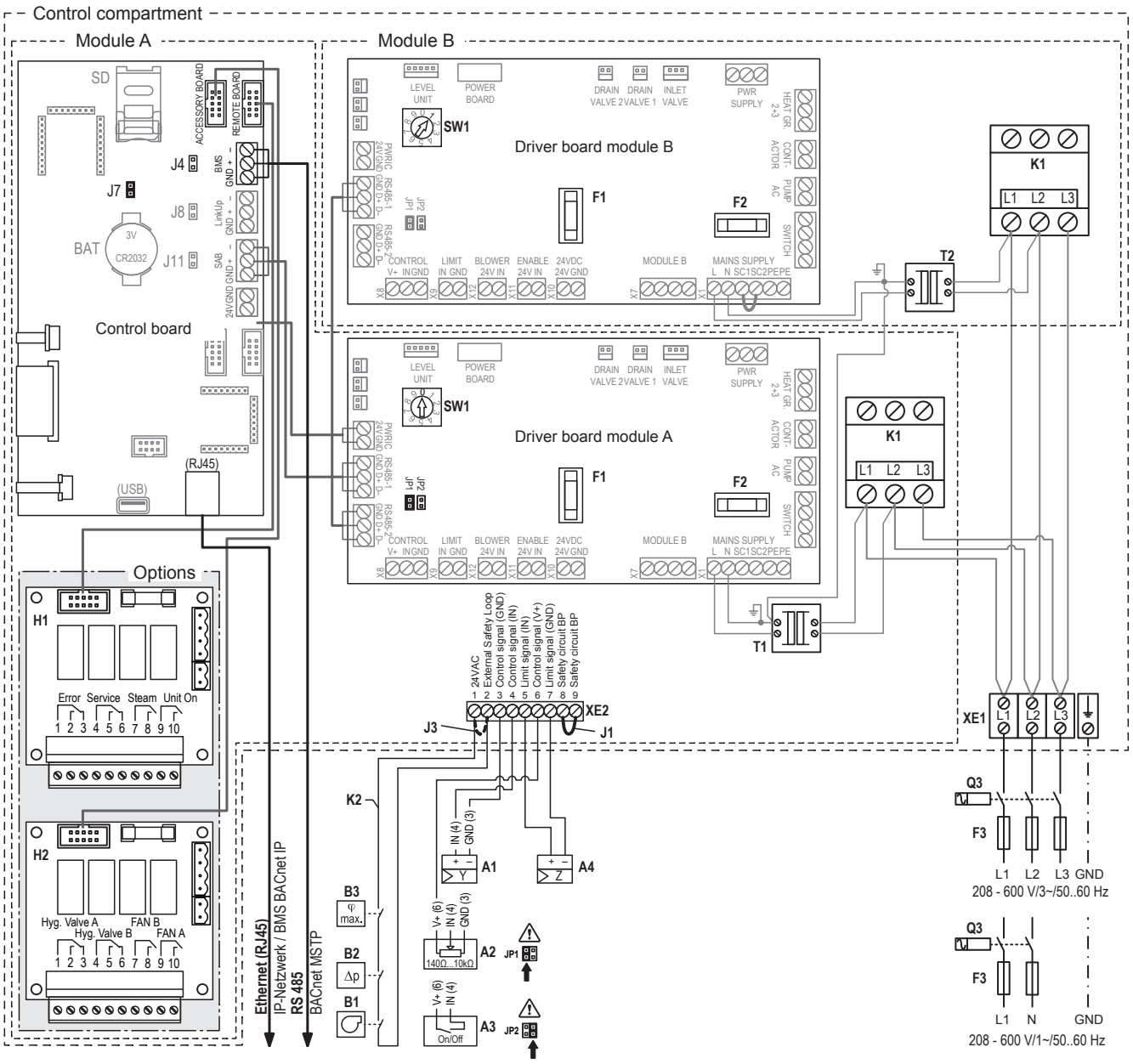


A1 Continuous humidity controller (active) or humidity sensor
A2 Ohmic humidity controller (passive), set jumper JP1 and remove jumper JP2
A3 On/Off humidity controller, set jumper JP2 and remove jumper JP1
A4 Limiter signal
B1 Ventilation interlock
B2 Airflow monitor
B3 Safety humidistat
F1 Internal fuse 24V supply (1 A, slow acting)
F2 Internal fuse 230V supply (6.3 A, slow acting)
F3 External fuse heating voltage supply (see table in *Section 5.8.5*)
F4 External fuse control voltage (max. 10 A, slow acting)
F5 Internal fuse control module (200 mA, quick acting)

J1 Jumper wire, if no blower pack is connected
J3 Jumper wire, if no monitoring devices are connected to SC1 and SC2
J4 Jumper for activating the terminating resistor for Modbus network (Jumper must be connected, if Nortec RS is the last unit in the Modbus network)
J7 Jumper for activating Modbus or BACnet MSTP communication via RS485 interface (J6). If jumper is not in place no communication will take place through the RS485 interface
K1 Mains contactor (heating voltage)
K2 External safety circuit (safety humidistat, airflow monitor, etc.)
M Motor Blowepack
Q3 External main switch heating voltage supply
Q4 External main switch control voltage supply
SW1 Rotary switch module identification (must be left on position "0")
T1 Tranformer control voltage supply Module A
T2 Transformer blower pack supply
XE1 Supply voltage terminal block
XE2 Control terminal block

Fig. 25: Wiring diagram Nortec RS - Single units Small and Medium

5.8.3 Wiring diagram Nortec RS - large units

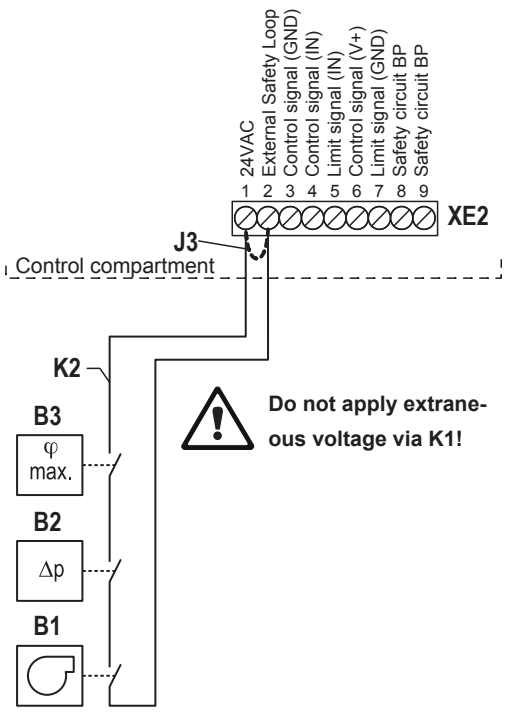


A1 Continuous humidity controller (active) or humidity sensor
A2 Ohmic humidity controller (passive), set jumper JP1 and remove jumper JP2
A3 On/Off humidity controller, set jumper JP2 and remove jumper JP1
A4 Limiter signal
B1 Ventilation interlock
B2 Airflow monitor
B3 Safety humidistat
F1 Internal fuse 24V supply (1 A, slow acting)
F2 Internal fuse 230V supply (6.3 A, slow acting)
F3 External fuse heating voltage supply (see table in *Section 5.8.5*)
F4 External fuse control voltage (max. 10 A, slow acting)
F5 Internal fuse control module (200 mA, quick acting)
H1 Remote operating and fault indication (option)
H2 Accessory board (option) for the control of an external fan of the AHU as well as the optional external valve for the water supply line flushing
J1 Jumper wire, **do not remove**
J3 Jumper wire, if no monitoring devices are connected to SC1 and SC2
J4 Jumper for activating the terminating resistor for Modbus network (Jumper must be connected, if Nortec RS is the last unit in the Modbus network)
J7 Jumper for activating Modbus or BACnet MSTP communication via RS485 interface (J6). If jumper is not in place no communication will take place through the RS485 interface
K1 Mains contactor (heating voltage) unit A/unit B
K2 External safety circuit (safety humidistat, airflow monitor, etc.)
Q3 External main switch heating voltage supply
Q4 External main switch control voltage supply
SW1 Rotary switch module identification (Master Module A: 0, Module B: 1)
T1 Tranformer control voltage supply Module A
T2 Tranformer control voltage supply Module B
XE1 Supply voltage terminal block
XE2 Control terminal block

Fig. 26: Wiring diagram Nortec RS - Large units

5.8.4 Installation work external connections

Connecting the external safety chain



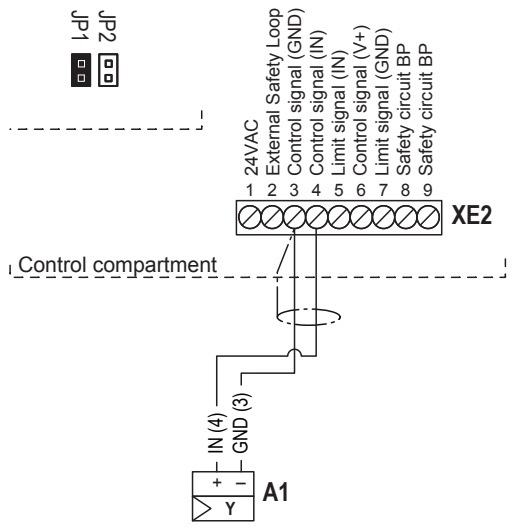
The potential-free contacts of external monitoring devices (e.g. ventilation interlock, safety high limit humidistat, airflow monitor, etc.) are connected in series (safety chain "K2") to the terminals "1" and "2" of the control terminal block "XE2" inside the control compartment in accordance with the wiring diagram.
The connecting cable must be led through a cable gland into the control compartment.

Caution! A **high limit humidistat is highly recomended** to prevent risk of over-humidification and potential damage to property.

Note: If, for whatever reason, no external monitoring devices are connected, a jumper wire "J3" must be installed on the contacts "1" and "2" of the control terminal block.

CAUTION! Do not apply any extraneous voltage to contacts "1" and "2" via the contacts of the external monitoring devices.

Connecting the demand or humidity signal

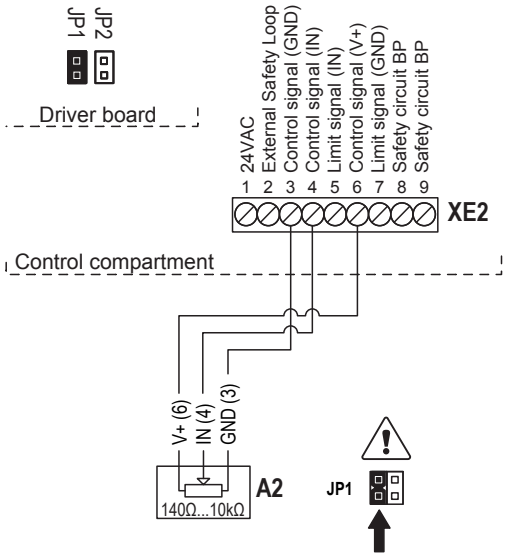


The signal cable of an external controller or of a humidity sensor (if the internal P/PI controller is used) are to be connected according to the wiring diagram to the terminals "3" (GND) and "4" (IN) of the control terminal block "XE2" inside the control compartment. The admissible signal values can be found in the technical data table in the operation manual. The connecting cable must be led through a cable gland into the control compartment.

Note: The admissible humidity control signal values can be found in the technical data table in the operation manual.

If a shielded signal cable is used, connect the shielding to terminal "3" (GND).
Caution! If the shielding of the control signal is **already connected to a potential or a grounded conductor, do not** connect it to terminal "3" (GND).

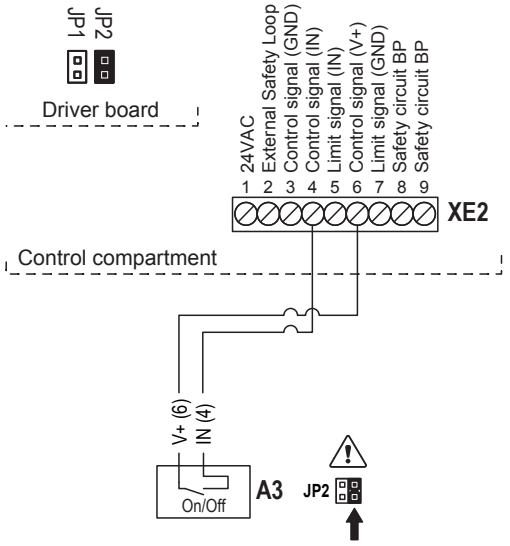
Ohmic humidity controller (passive)



The signal cable of an ohmic humidity controller (140Ω...10kΩ) is to be connected according to the wiring diagram to the terminals "3" (GND), "4" (IN) and "6" (V+) of the control terminal block "XE2" inside the control compartment.
The connecting cable must be led through a cable gland into the control compartment.

Note: when connecting an ohmic humidity controller Jumper "JP2" must be removed and Jumper "JP1" must be connected on the driver board and the control signal type must be set to 0-10V in the control settings of the control software.

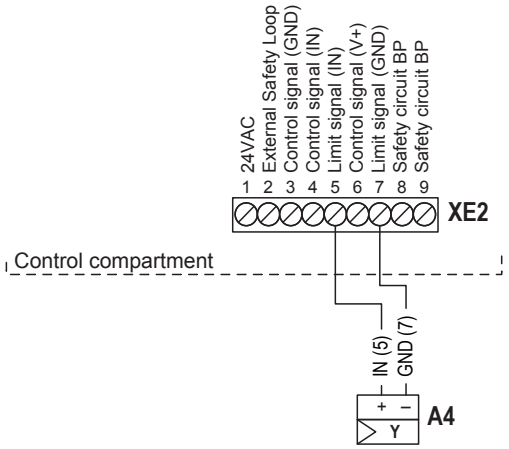
24V On/Off humidistat



The signal cable of 24V On/Off humidistat is to be connected according to the wiring diagram to the terminals "4" (IN) and "6" (V+) of the control terminal block "XE2" inside the control compartment.
The connecting cable must be led through a cable gland into the control compartment.

Note: when connecting a 24V On/Off humidistat Jumper "JP1" must be removed and Jumper "JP2" must be connected.

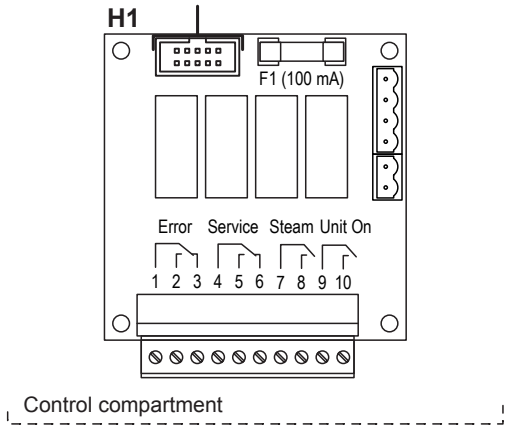
Limiter signal



The signal cable of an external limiter (P/PI continuous controller) is to be connected according to the wiring diagram to the terminals "5" (Limit signal IN) and "7" (Limit signal GND) of the control terminal block "XE2" inside the control compartment .
The connecting cable must be led through a cable gland into the control compartment.

Note: The limiter must be activated and configured via the control software. The admissible limiter signal values can be found in the technical data table in the operation manual.

Connecting the optional remote operating and fault indication



The optional remote operating and fault indication board contains four potential-free relay contacts for the connection of the following operating and fault indications:

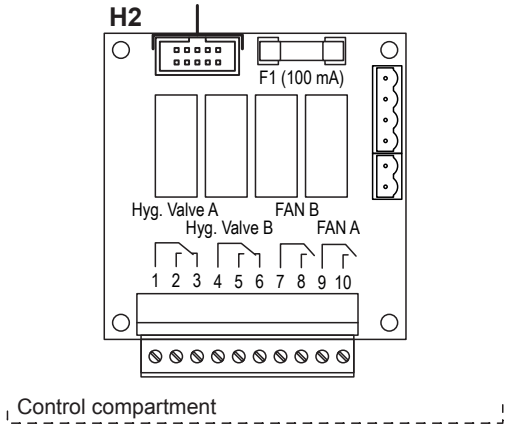
– "Error" (Terminal 1 and 2):
  This relay is activated if an error is present.
– "Service" (Terminal 4 and 5):
  This relay is activated when the set maintenance interval has elapsed.
  Note: this relay can be configured in the control software to close either when maintenance is required or when maintenance is required and when a warning is indicated.
– "Steam" (Terminal 7 and 8):
  This relay closes as soon as the Condair EL humidifies.
– "Unit on" (Terminal 9 and 10):
  This relay closes as soon as the voltage supply to the Control compartment of the Condair EL is switched on.

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

The **maximum contact loading** is **250V/8A**.

Appropriate suppressor modules are to be used for the switching of relays and miniature contactors.

Connecting the optional accessory board



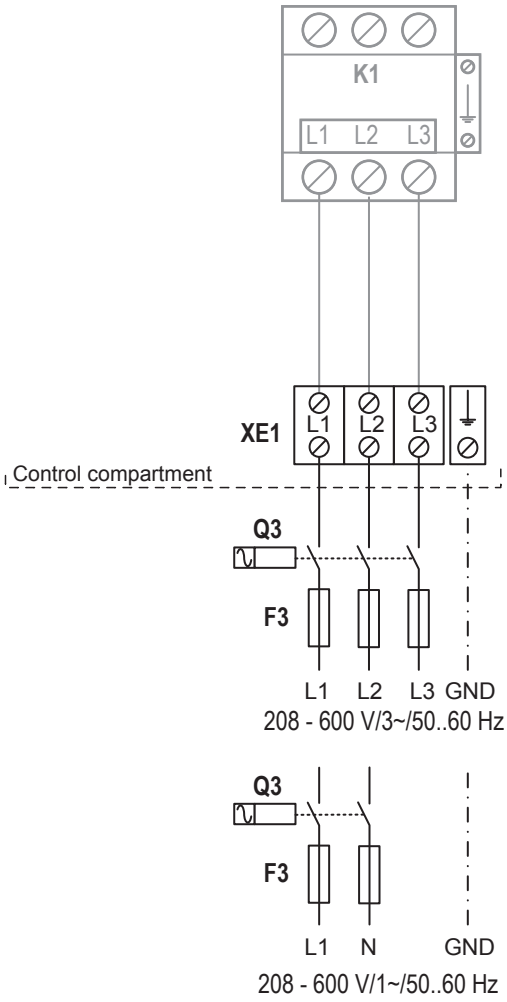
The optional accessory board contains four potential-free relay contacts to activate external fans of the AHU and the optional valves for flushing the water supply lines:

– "Hyg. Valve A" (Terminal 1 and 2):
  This relay activates the optional valve for flushing the water supply line connected to module A.
– "Hyg. Valve B" (Terminal 4 and 5):
  This relay activates the optional valve for flushing the water supply line connected to module B.
– "FAN B" (Terminal 7 and 8):
  This relay activates an external fan of the AHU if module B is producing steam.
– "FAN A" (Terminal 9 and 10):
  This relay activates an external fan of the AHU if module A is producing steam.

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

The **maximum contact loading** is **250V/8A**.

Connecting the voltage supply



The **voltage supply** (L1, L2, L3 and GND or L1 and) is to be connected in accordance with the wiring diagram to the corresponding terminals of the main contactor in the control compartment. The earth conductor is to be connected to the earth terminal right beside the phase terminals. The supply wiring is to be fed into the unit via the clamp strap on the bottom of the unit.

The installation of the **fuses F3** and the **electrical isolator "Q3"** (all pole disconnecting device with a minimum contact clearance of 3 mm) in the mains supply line are mandatory.
Note: a table with the values for the fuses "F3" is to be found in *Section 5.8.5*.

For safety reasons the additional installation of a residual current circuit breaker in the mains supply line (supplied by others) is recommended. However, the local electrical installation regulations must be observed and adhered to.

The electrical isolator must be mounted in direct proximity of the control compartment (max. distance 1 m) and must be easily accessible in a height between 0.6 m and 1.9 m (recommended: 1.7 m) .

CAUTION! Make sure the voltage indicated on the specification label meets the local mains voltage. Otherwise, do not connect the unit.

The cross-section of the mains cable must comply with the applicable local regulations.

Connecting the blower pack BP

See separate documentation for blower pack BP.

5.8.5 Fuses "F3" voltage supply

	208 V/1~/50...60 Hz				240 V/1~/50...60 Hz				480 V/1~/50...60 Hz				600 V/1~/50...60 Hz			
	PN max. in kW	IN max. in A	AL min. in mm2	F3 in A, quick acting (gR)	PN max. in kW	IN max. in A	AL min. in mm2	F3 in A, quick acting (gR)	PN max. in kW	IN max. in A	AL min. in mm2	F3 in A, quick acting (gR)	PN max. in kW	IN max. in A	AL min. in mm2	F3 in A, quick acting (gR)
RS 10	3.7	17.8	4	25	3.7	15.5	2.5	20	3.3	6.9	2.5	15	3.9	6.5	2.5	15
RS 15	5.4	26	6	35	4.9	20.6	4	25	4.8	10	2.5	15	5	8.3	2.5	15
RS 20	7.2	34.7	10	50	7.2	30	10	40	6.4	13.3	2.5	15	6.7	11.1	2.5	15
RS 30	10.8	52	16	70	10.8	45	16	60	10.7	22.3	4	25	10.7	17.8	4	25
RS 45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RS 65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RS 90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RS 130	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RS 180	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

	208 V/3~/50...60 Hz				240 V/3~/50...60 Hz				480 V/3~/50...60 Hz				600 V/3~/50...60 Hz			
	PN max. in kW	IN max. in A	A min. in mm2	F3 in A, quick acting (gR)	PN max. in kW	IN max. in A	A min. in mm2	F3 in A, quick acting (gR)	PN max. in kW	IN max. in A	A min. in mm2	F3 in A, quick acting (gR)	PN max. in kW	IN max. in A	A min. in mm2	F3 in A, quick acting (gR)
RS 10	3.7	10.3	2.5	15	3.7	8.9	2.5	15	3.8	4.6	2.5	15	3.8	3.6	2.5	15
RS 15	5.4	15	2.5	20	4.9	11.9	2.5	15	5	6	2.5	15	6	5.8	2.5	15
RS 20	7.2	20	4	30	7.2	17.3	4	25	6.6	7.9	2.5	15	7.7	7.4	2.5	15
RS 30	9.8	27.2	6	40	10.8	26	6	35	10.7	12.9	2.5	20	10.7	10.3	2.5	15
RS 45	16.2	45	10	60	16.1	38.7	16	50	15.4	18.5	4	25	16	15.4	2.5	20
RS 65	24.3	67.5	16	80	24.1	58	25	80	21.4	25.8	6	35	24	23.1	6	30
RS 90	32.4	90	35	125	32.2	77.4	35	100	32.1	38.7	8	50	32	30.8	10	40
RS 130	48.6	135	50	150	48.2	116	50	150	42.8	51.6	25	70	48	46.2	16	60
RS 180	—	—	—	—	—	—	—	—	64.2	77.3	35	100	64	61.7	25	80

5.8.6 Inspecting the electrical installation

Check the following points:

- ☐ Do the supply voltages for heating and control voltage comply with the relevant voltages stated on the specification label?
- ☐ Are the voltage supplies (heating and control voltage) correctly fused?
- ☐ Are the service switches "Q.." installed in the supply lines for to the heating and control voltage?
- ☐ Are all components correctly connected according to the wiring diagram?
- ☐ Are all connecting cables fastened?
- ☐ Are the connecting cables free of tension (passed through cable glands?)
- ☐ Does the electric installation meet the applicable local regulations for electric installations?
- ☐ Is the unit reassembled correctly and the front panel fixed with the screw?

6 Appendix

6.1 Unit dimensions

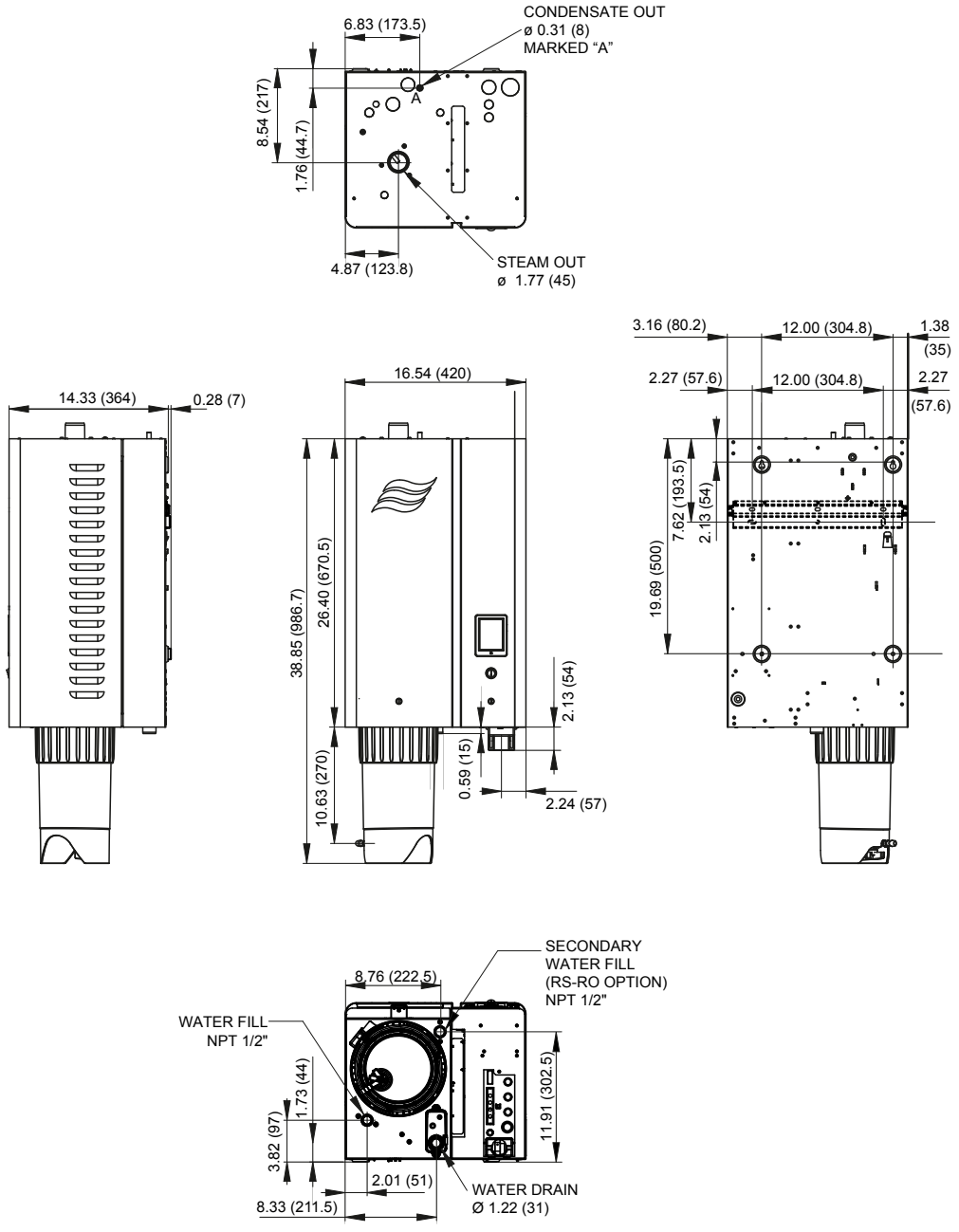


Fig. 27: Unit dimensions unit "Small" - dimensions in Inch (mm)

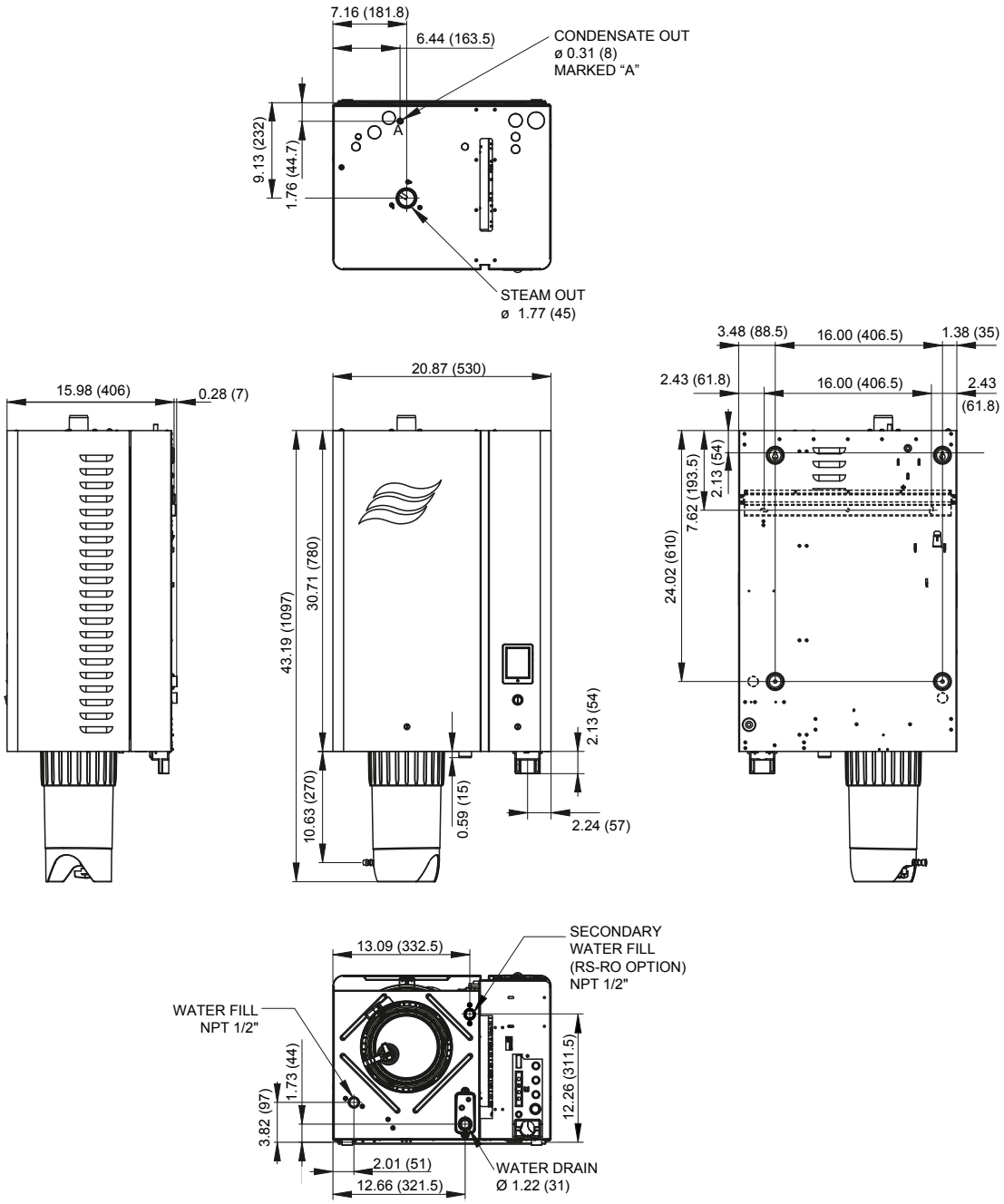


Fig. 28: Unit dimensions unit "Medium"- dimensions in Inch (mm)

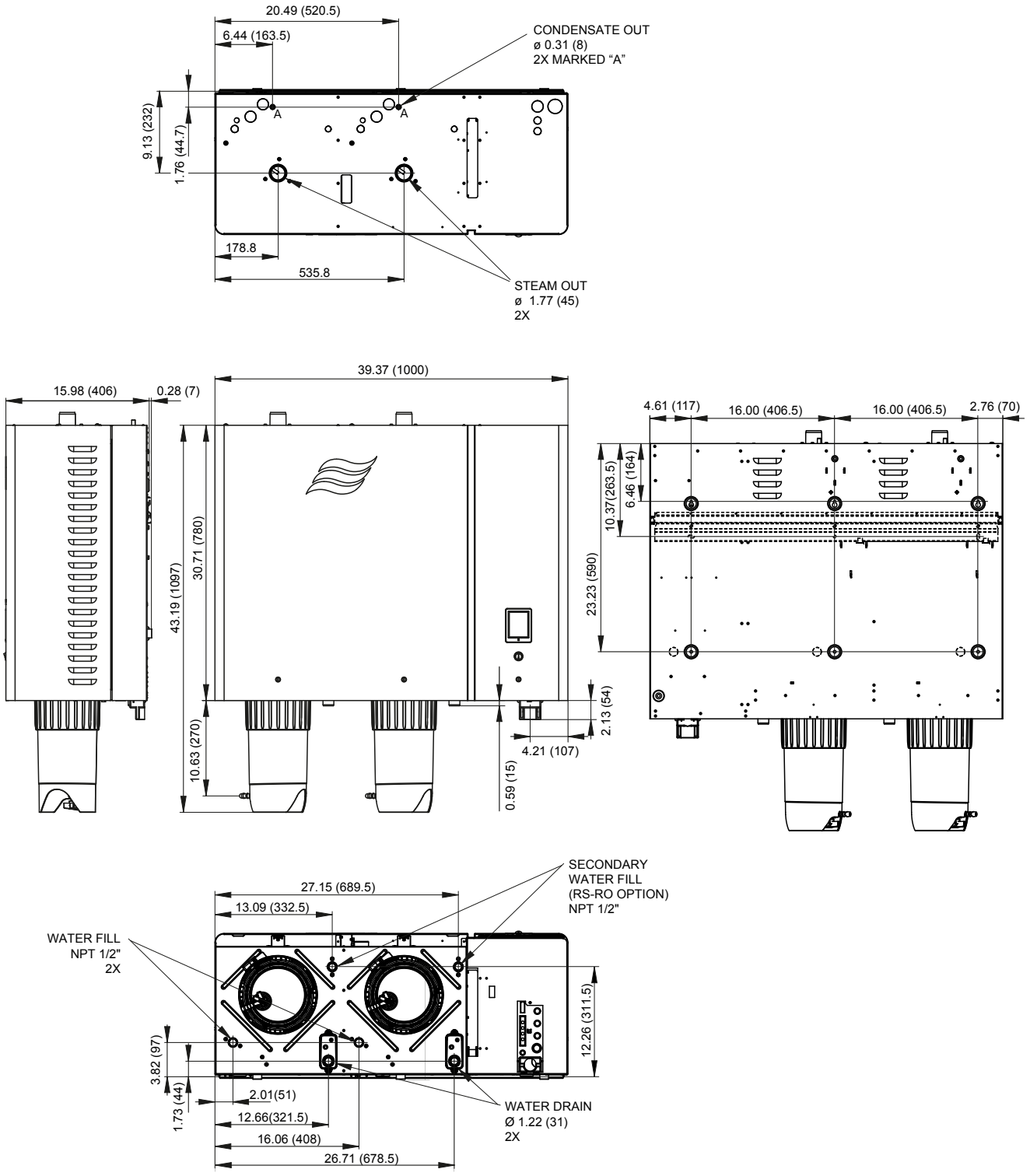


Fig. 29: Unit dimensions unit "Large"- dimensions in Inch (mm)

Notes

Notes

Notes

Warranty

Condair Inc. and/or Condair Ltd. (hereinafter collectively referred to as THE COMPANY), warrant for a period of two years after installation or 30 months from manufacturer's ship date, whichever date is earlier, that THE COMPANY's manufactured and assembled products, not otherwise expressly warranted (with the exception of the cylinder), are free from defects in material and workmanship. No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

THE COMPANY's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. THE COMPANY's factory, providing the defective part(s) is returned freight prepaid by the customer. 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.

The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to THE COMPANY 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 must be in writing, signed by an officer of THE COMPANY.

THE COMPANY's limited warranty on accessories, not of the companies manufacture, such as controls, humidistats, pumps, etc. is limited to the warranty of the original equipment manufacturer from date of original shipment of humidifier.

THE COMPANY makes no warranty and assumes no liability unless the equipment is installed in strict accordance with a copy of the catalog and installation manual in effect at the date of purchase and by a contractor approved by THE COMPANY to install such equipment.

THE COMPANY 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.

THE COMPANY makes no warranty and assumes no liability whatsoever for damage resulting from freezing of the humidifier, supply lines, drain lines, or steam distribution systems.

THE COMPANY retains the right to change the design, specification and performance criteria of its products without notice or obligation.

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