

Quick Start Installation Guide

Atmospheric
Steam Lines



General

1. Always minimize the overall length and number of bends in steam supply lines. Steam lines create losses in the atmospheric steam being supplied. As the overall length is increased, a greater amount of steam will be lost as condensate. Losses in steam will limit the capacity of a humidifier and can cause backpressure issues.
2. Always refer to the Installation and Operation Manual for the humidifier being installed for values of maximum steam line runs. These values will vary based on humidifier type, steam line material, steam line diameter, etc.
3. Short lengths of Condair Steam Hose are used to connect the steam line (if using a rigid material) to the humidifier and steam distributor. Secure the steam hoses with clamps. Do not over tighten, maximum torque is 12 in•lbs for 7/8 in. clamps and 16 in•lbs for 1-3/4 in. clamps.
4. Regardless of material type being used, the steam line must be fully supported along its entire length. This is to ensure the weight of the steam line is not being supported by the humidifier or distributor.
5. 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.
6. After steam line installation, the line should be purged to remove any contaminants and installation debris.

Condair does not accept responsibility for improper material selection.

1. Proper steam line material must be chosen for each particular application to ensure the highest level of efficiency and functionality of the humidification system. See Table 1 for summarized material recommendations.
2. Stainless steel or copper tubes are always the most recommended to provide minimal condensate losses and the longest possible steam line run.
3. Condair Steam Hose can be used in atmospheric steam applications where the distance from the humidifier to distributor is relatively short (10 feet or less). Never use steam line hoses other than the ones provided by Condair. Other brands may not be properly designed for the application and can impact the performance of the humidifier.
4. If selecting stainless steel or copper tubing, insulate the entire length of steam line with 1" thick fiberglass insulation. See Figure 1.
5. Materials such as black iron pipe or plastic should never be used for atmospheric steam line installation. Not using the recommended materials outlined in Table 1 could introduce health hazards, rusting, large pressure drops, premature deterioration, etc.

Table 1: Material Recommendations

Material	Type	Notes
Copper	MED-L Tube	Recommended: • Install with 1 in. thick insulation
Stainless Steel	0.065 in. wall thickness	Recommended: • Install with 1 in. thick insulation
Condair Steam Hose	High temperature rubber hose	Condair braided steam hose: • Recommended for short runs ≤ 10 feet • Inspect every 5 years Other brands: • May carry odors • Can become deformed or kink • Quicker deterioration • May cause backpressure issues and affect humidifier performance

Distance	Steam Hose	Copper Tube	Stainless Steel Tube
Short run ≤ 10 ft.	✓	✓	✓
Long run >10 ft.		✓	✓
DI/RO Water			✓



Figure 1: Insulated Pipe

Orientation and Geometry of Installation

Condair does not accept responsibility for improper installations of steam lines.

- 1. Always install at least 12" of vertical run directly from the humidifier before any slope or bend occurs. See Figure 2.

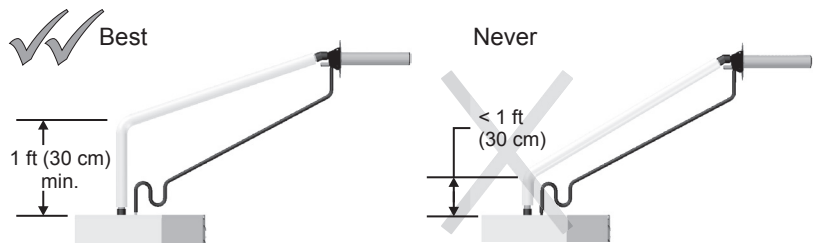


Figure 2: Vertical height recommendation from humidifier.

- 2. For upward slopes in steam lines, minimum allowable slope is 10 degrees grade (2" vertically up per 12" horizontal run). See Figure 3.
- 3. For downward slopes in steam lines, minimum allowable slope is 2 degrees grade (0.5" vertically down per 12" horizontal run). See Figure 3.

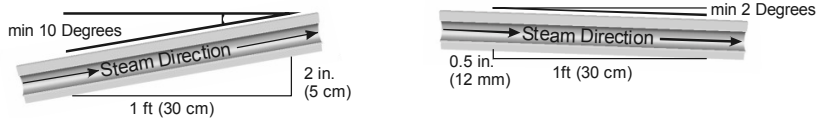


Figure 3: Minimum line sloping requirements.

- 4. Correction factor lengths must be added to the total run of the steam line whenever there is a bend, elbow or tee within the steam line. Refer to Table 2 for equivalent length correction factors.

Table 2: Equivalent length correction factors for a given tube diameter.

Nominal Tube Diameter	Standard 90 Degree Elbow	Standard 45 Degree Elbow	Side Outlet Tee
0.75 in. – 0.875 in.	2 ft.	1 ft.	4 ft.
1.5 in. – 1.75 in.	3.5 ft.	1.75 ft.	7 ft.
3 in.	5 ft.	2.5 ft.	11 ft.
4 in.	8 ft.	4 ft.	15 ft.

- 5. Always ensure a minimum bend radius of 12" when using flexible steam hoses or 5 times the internal diameter for rigid steam lines. See Figure 4.



Figure 4: Minimum bend radius in steam lines.

- 6. Steam hoses must be supported at frequent intervals along the steam line run. Any low point in the steam line will collect condensate, which must be avoided or properly egressed to prevent any back pressure issues with the humidifier.

7. Steam line diameter sizing may be increased for applications with relatively long steam line runs. See the humidifier Installation and Operation Manual for oversizing values and associated maximum steam line runs. Never increase the diameter of the steam line on an upward slope without a properly installed trap. Ideally the line diameter increase should be installed on a downward slope. See Figure 5 for details.

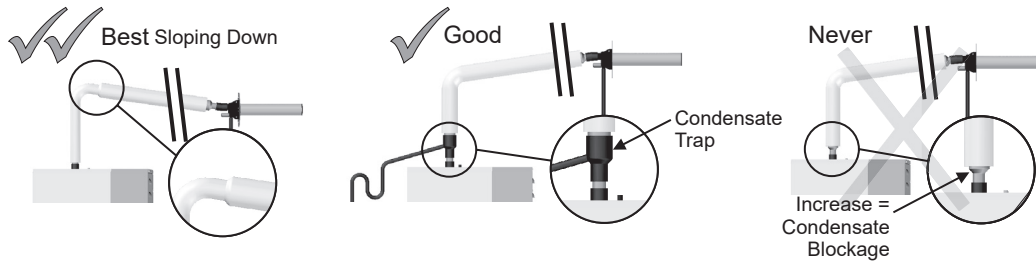


Figure 5: Rules for increasing the steam line diameter.

8. When supplying a single distributor by multiple humidifiers, always run separate steam lines for the entire run. Connect the steam lines by a Condair Adapter Box at the distributor. Never connect lines on an upward slope. See Figure 6.



Notes: 1. Units must operate in parallel.
2. Also for double units (cylinders must operate in parallel).

Figure 6: Connecting multiple steam lines to a single distributor.

9. Never install valves or reducers along the steam line run. If a steam line reducer is required, this must be installed directly at the connection to the steam distributor. A condensate trap would need to be installed at the reducer.

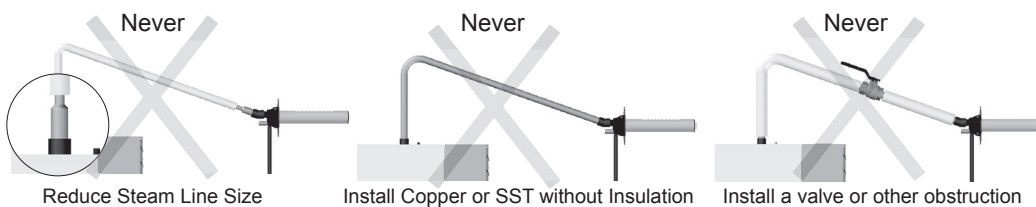


Figure 7: Poor installation examples.

Condensate Traps

1. Condensate drain lines must have a minimum slope of 1 in./48 in. (1.2°). See Figure 8 for details.
2. Use full size condensate tees in order to collect the condensate and then egress it to the drain. See Figure 8 for details.
3. The trap height should have a minimum of 12" head. The drip should be the greater value of either 6" in height, or duct static pressure plus 2". See Figure 8 for details.
4. Always use 3/8 in. Condaire Condensate Hose (PN 1328840), 3/8 in. stainless steel pipe or 1/4 in. copper pipe for traps in the condensate lines. See Figure 8 for details.

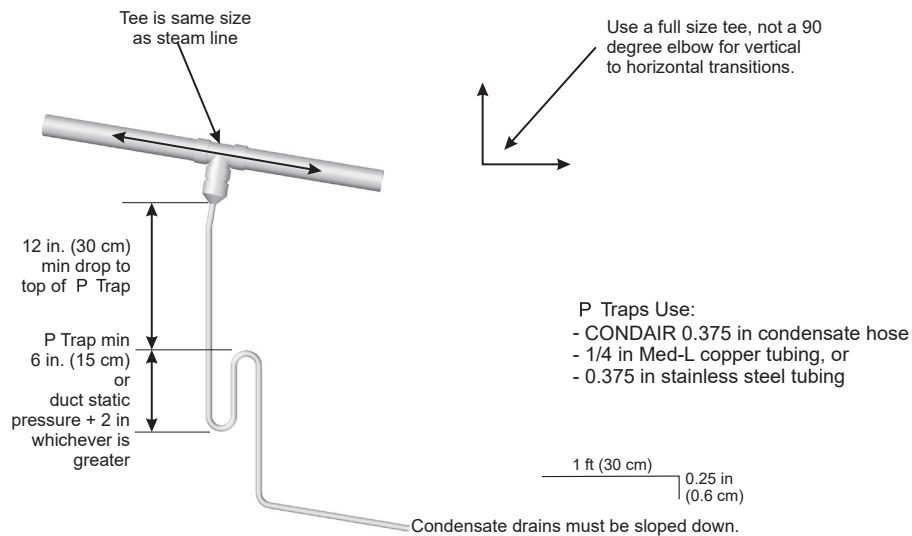


Figure 8: General condensate trap details.

5. As a minimum guideline, condensate traps must be installed along the steam line for each of the following scenarios:
 - a. At the base of a horizontal to vertical transition.
 - b. At any low point along the steam line.
 - c. After a length of steam line run 15 feet or greater.
- See Figures 9 and 10 for details on typical condensate trap installation locations.



Figure 9: Condensate trap installation at low points in line and at horizontal to vertical transitions.

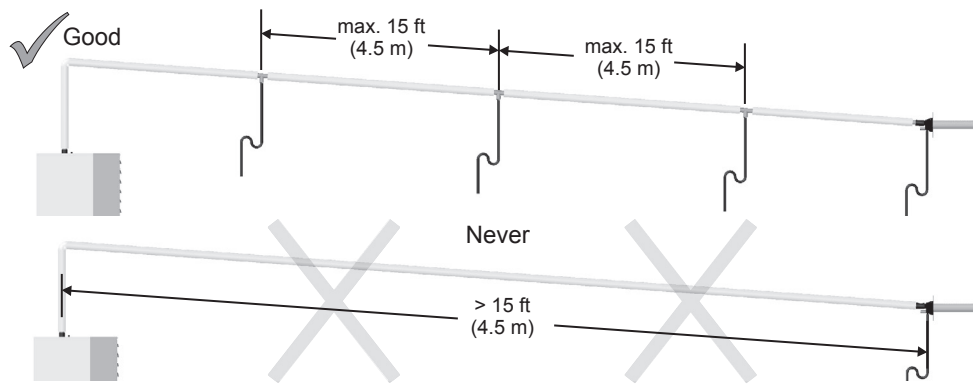


Figure 10: Condensate trap installation locations in long steam line runs.

6. For applications with long vertical steam runs out of the humidifier, a full size condensate trap should be installed along the vertical run to catch the condensate load rather than have it all flow directly back to the humidifier reservoir. See Figure 11 for an example.

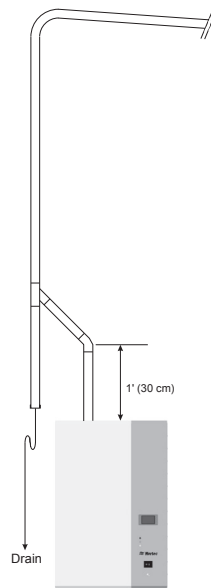


Figure 11: Condensate traps in large vertical runs from humidifier.

7. 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.
8. Before starting the unit, fill the traps in the condensate lines with water.

All information contained in this Quick Start Guide is for general information purposes only. For complete Condair installation/operation recommendations for your Condair equipment, please refer to the installation manual for your specific system, accessories, and components.

All electrical connections must be installed in accordance with local and national electrical code requirements by a licensed electrician.

All water supply and drain line connections must be installed in accordance with local plumbing codes by a licensed plumber.

Condair does not accept any liability for installations of humidity equipment installed by unqualified personnel or the use of parts/components/equipment that are not authorized or approved by Condair.



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