



HumidiPack®, HumidiPackPlus®, and HumidiPackPlus® CF Steam Humidifier Systems



Importance of Non-wetting Distance

Non-wetting distance is an important consideration in the proper application of steam humidification equipment. Shorter distances simplify the job of the design engineer by allowing proper placement of temperature and humidity controllers and other components without fear of inaccurate readings or moisture damaged equipment. Air handling unit manufacturers concerned about the “footprint” of their units and end users with limited space in mechanical rooms also benefit.

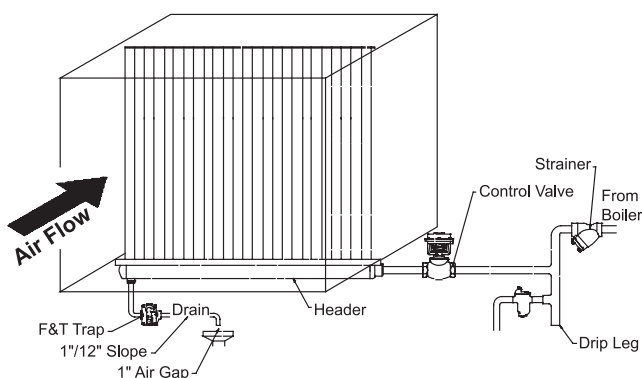
HumidiPack®

The Armstrong HumidiPack® is a pre-fabricated steam humidifier system that is ready for insertion into the duct. The HumidiPack consists of a separator/header and multiple tube dispersion assembly when supplied for use with Armstrong steam generators. A steam supply control valve, strainer, steam trap, and a header drain trap are added when HumidiPack is used on pressurized steam. The HumidiPack accepts steam, separates entrained moisture from it, and admits it into a duct or air handler air stream via the dispersion assembly in a manner which substantially reduces non-wetting distance when compared to traditional humidifiers.

HumidiPackPlus®

HumidiPackPlus® combines the non-wetting distance shortening performance of HumidiPack with the additional feature of steam jacketed “active” tubes. The result is a dry, uniform discharge of steam for nearly any application with a steam source from a pressurized, central supply.

Figure 80-1. HumidiPack



HumidiPack® CF

HumidiPack CF offers the performance of HumidiPackPlus without the need of jacketing steam on pressurized steam applications. Typically used with a vertical header configuration, HumidiPack CF offers excellent separation of entrained moisture from steam with preheated active tubes. The entire face area is cold during periods of no demand, adding no energy to the air stream.

Simplified Installation

The HumidiPack and HumidiPackPlus dispersion assemblies slide neatly into ductwork or air handling units. This frequently reduces the time and labor required for field installations. Units with horizontal tubes and vertical headers offer all piping on one side of the ductwork or air handler to simplify piping.

Stainless Steel Construction

HumidiPack and HumidiPackPlus rugged designs offer stainless steel construction of wetted parts including the header/separator and dispersion assembly for a long trouble-free operating life. Tube to header joints consist of welded stainless steel rather than assembled plastic adapters with o-rings, minimizing service requirements.

Compatible With Many Steam Sources

HumidiPack may be used with Armstrong Steam-to-Steam, gas and electric steam generating humidifiers, also with some systems including packaged boilers or central steam supply to 60 psig (4 bar). HumidiPackPlus may be used with packaged boilers or central steam supply to 60 psig (4 bar).

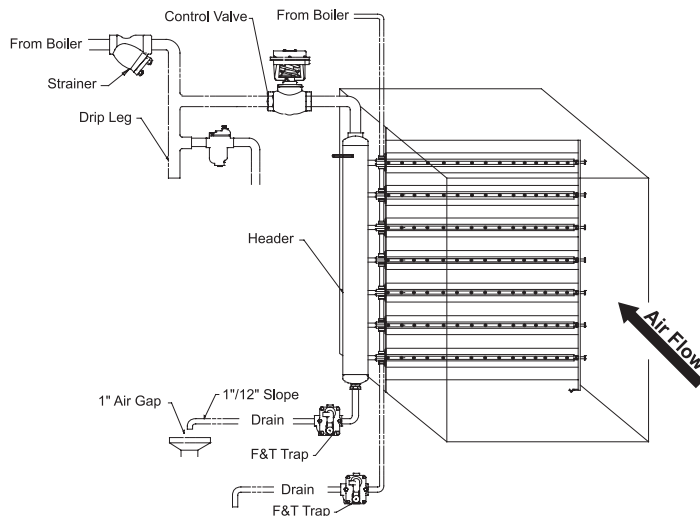
Application Flexibility

Many sizes and configurations of HumidiPack and HumidiPackPlus are available to meet new installation or retrofit needs.

Reduced Heat Gain to Duct Air from HumidiPack

Since no steam is admitted to the manifold assembly unless there is a demand for steam output, there is no heat gain to duct air when HumidiPack is not in use.

Figure 80-2. HumidiPackPlus



Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Non-wetting Distance Considerations

Non-wetting distance is an important issue in the proper design and installation of steam humidification equipment. In the humidification process, steam is discharged from the manifold as a “dry” gas. As it mixes with the cooler duct air, some condensation takes place resulting in water particles becoming entrained in the airstream. After a distance these droplets are dispersed by and absorbed into the airstream. Until they are absorbed, these particles can impinge upon any equipment they contact, adversely affecting its operation or service life.

Many applications can be satisfactorily addressed by using a single manifold with a direct steam injection humidifier (See Figure 81-1) or single dispersion tube with a steam

generator (See Figure 81-2). Frequently, however, performance and practicality dictate the use of multiple manifolds or dispersion tubes. These are field assembled (See Figure 81-3).

When non-wetting distance parameters or size limitations do not allow the use of multiple manifolds with Armstrong Series 9000 or 1000 humidifiers or multiple dispersion tubes with Armstrong steam-to-steam or electronic humidifiers, the Armstrong HumidiPack or HumidiPackPlus is used.

Please consult with your Armstrong Representative with questions regarding selection of any of these humidification products.

Armstrong Steam Distribution Options for Air Handling Systems

Figure 81-1.

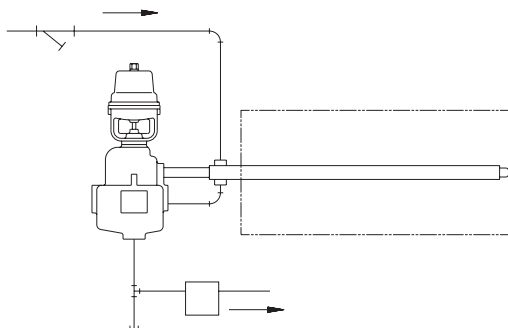


Figure 81-2.

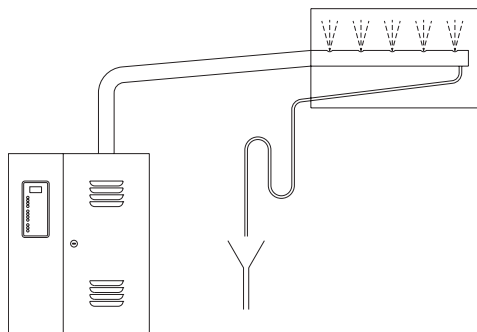
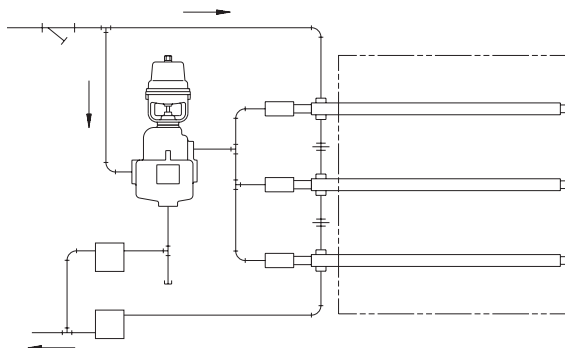


Figure 81-3.



How HumidiPack Shortens Non-wetting Distances

Conditioned steam enters each of the dispersion tubes and flows through steam nozzles (not required on HumidiPackPlus) which extend from the center of each tube, before discharging through orifices into the airstream.

Air flow approaching the HumidiPack first encounters baffle tubes (See Figure 81-4) which influence its flow pattern and increase its velocity. Air traveling around each set of baffle tubes encounters an opposing flow of steam exiting the orifices. The result is more uniform distribution and faster absorption of moisture into the air, resulting in shorter non-wetting distances than experienced with traditional manifolds or dispersion tubes.

Figure 81-4. Mixing of Air and Steam (HumidiPack shown)

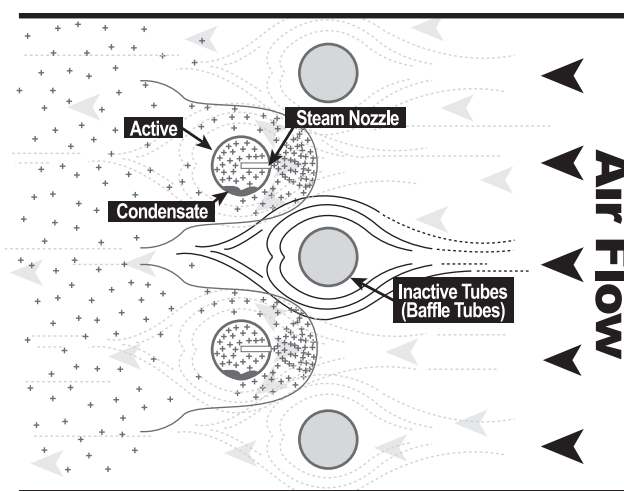


Figure 82-1. Vertical HumidiPack (Left Steam Supply)

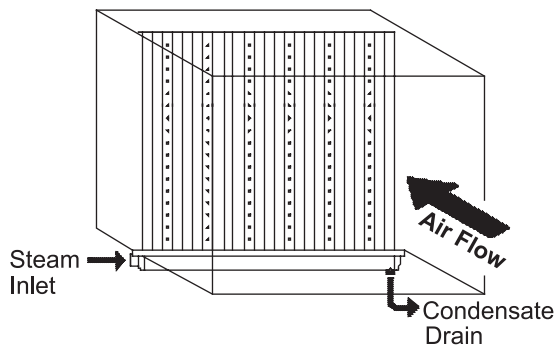


Figure 82-2. Vertical HumidiPack (Right Steam Supply)

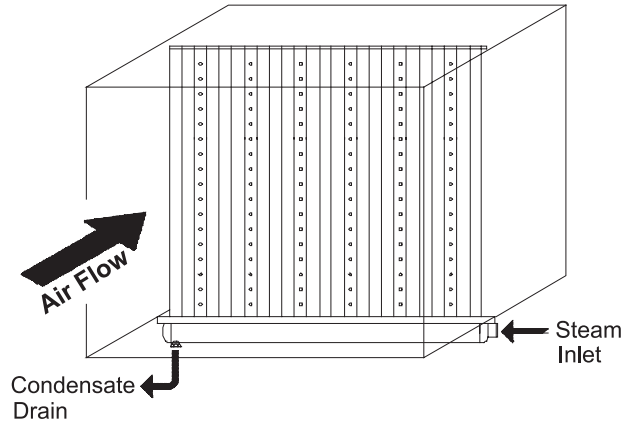


Figure 82-3. Horizontal HumidiPackPlus (Left Steam Supply)

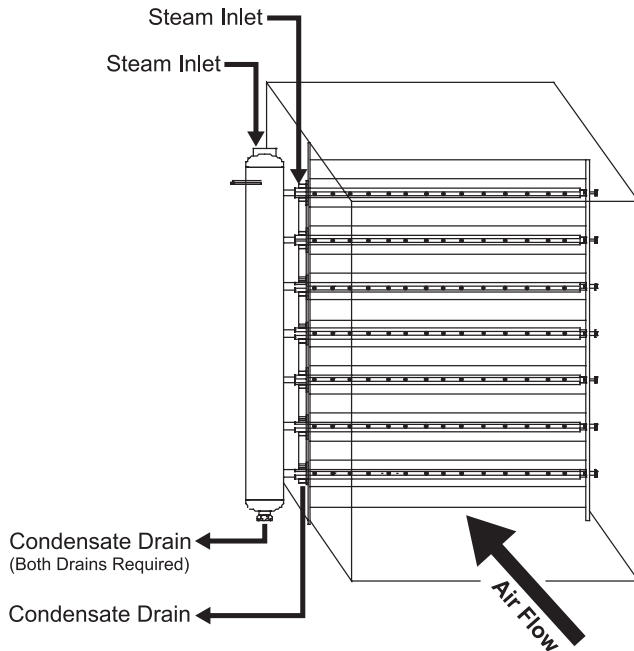
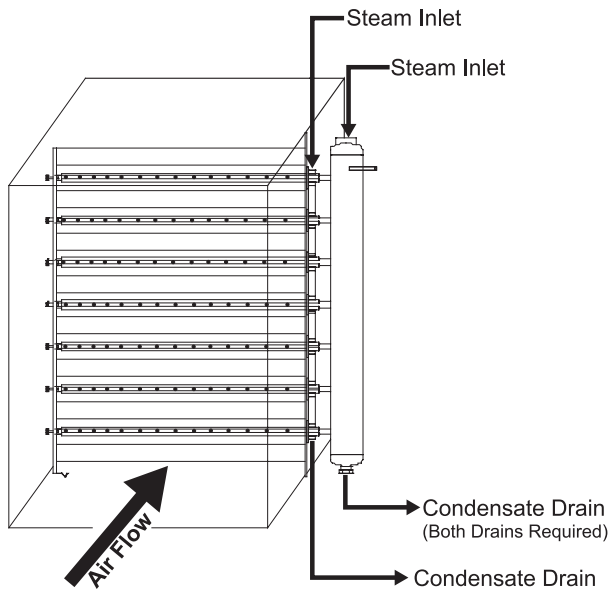


Figure 82-4. Horizontal HumidiPackPlus (Right Steam Supply)



Note: Horizontal HumidiPack and HumidiPack CF orientation similar.

HumidiPack® Series shopvalves.com

Selection and Ordering Procedure



Selection

1. There are two ways to obtain a selection, by contacting your local Armstrong Representative or by using Armstrong's Humid-A-ware Humidification Sizing and Selection Software. Information on both of these options can be found at armstronginternational.com.
2. With either option you will need to verify that all required information is available. See "Requesting a Selection" section for required information.
3. For type of panel selection see the table below to see what HumidiPack type fits your application.
4. If using the Humid-A-ware selection software, you will have the ability to calculate all required information. This includes required load, downstream RH, air pressure drop, temperature gain, condensation rate, and non-wetting distance. All of this information and more can be easily printed in a schedule format.

Selecting what HumidiPack type fits your Application			
	HumidiPack CF	HumidiPack Plus	HumidiPack
Pressurized Steam *	X	X	X
Atmospheric Steam	N/A	N/A	X
Vertical Header Max Size (H x T)	X (72" x 144")	X (72" x 144")	X (72" x 36")
Horizontal Header Max Size (H x T)	N/A	X (72" x 72")	X (72" x 72")

Notes:

- To determine handedness for all air flows, right and left handed orientations are determined with the air flow at your back. With you looking downstream at the panel.
- All three of these types of panels allow for stacking of the fabricated banks or placement side by side for application of greater size. If the applications has capacity requirements greater than the max allowable please see the section below for alternate options.
- * Standard HumidiPack includes (when steam source is pressurized) a strainer and inverted bucket trap for steam, control valve, and one header drain trap for the separator/header. HumidiPack CF includes an additional trap to drain the outer header, and HumidiPack Plus includes an additional trap to drain the dispersion tube jackets.

For applications with greater capacity requirements than max allowable capacity for the selected size of panel, options include:

Standard HumidiPack includes (when steam source is plant steam) a strainer and inverted bucket trap for steam supply, control valve, and one header drain trap for the separator/header. HumidiPackPlus includes an additional trap to drain the dispersion tube jackets.

Requesting a Selection

Information required includes the following:

- Height and Width of Duct or Air Handler Unit (Please Specify)
- CFM
- Maximum required steam capacity
- Steam pressure (note if it is atmospheric)
- Maximum allowable air pressure drop (if specified)
- Duct air temperature
- Final (downstream) duct relative humidity
- Non-wetting distance available
- Airflow direction
- Header orientation required

Control valve information

- Type of control: Pneumatic, Electric
- Control signal
- Material of construction - Body

*For all horizontal air flows, right and left handed orientations are determined with air flow at your back. For all vertical air flows, right and left steam inlet locations are determined by looking at the unit with airflow at your back.

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.