

HOW IT WORKS

Direct Injection Steam Humidifiers

Humidity and Heating Costs

Relative humidity (RH) is a vital ingredient in total environmental control. Generally speaking, relative humidity maintained between 35% and 55% seems most conducive to human comfort. Drier air feels cooler than more humid air at the same temperature. This fact makes it possible to achieve a comfortable condition during the heating season at lower temperatures in a humidified building than in a building where RH is not controlled. The savings in heating costs can be significant over the course of just a single heating season. Besides heating costs, there are many other reasons to control RH:

- Prevent static electricity discharges that can ignite explosive gases in manufacturing and storage facilities, or damage computers and other electronic equipment
- Avoid material processing problems caused by static attraction and material distortion.
- Protect stored materials such as paper products, wood products, textiles, food stuffs and pharmaceuticals from degradation.

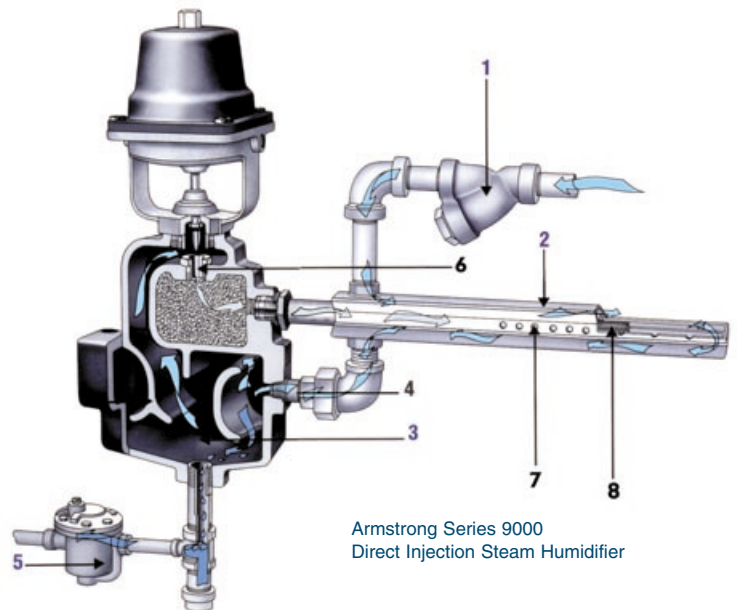
How to humidify

Steam humidification is recommended for virtually all commercial, institutional and industrial applications. One of the most popular types of steam humidifier is the direct injection steam humidifier, which adds moisture to the supply air of an HVAC system by the injection of steam directly into a duct.

Why Steam?

1. Steam is pure, sterile and odour free.
2. Steam contains no mineral dust to irritate personnel or foul a process.
3. Steam is easily controlled and able to meet variations in load without waste.
4. Maintenance is simple since there are few moving parts and they are all easily accessible outside of the duct.
5. There are no water pads to replace or pans, wheels etc. to clean and keep free of algae.
6. Steam eliminates the need for water in the heating ducts or the area being humidified. This removes the risk of stagnant water which can provide a fertile breeding ground for algae and bacteria.
7. The use of steam for humidification generally obviates any need for after-heaters in the air handing system.

Sources: Hygromatik, Armstrong



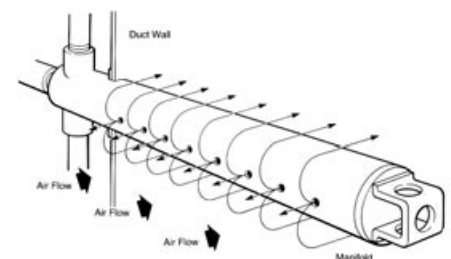
Armstrong Series 9000
Direct Injection Steam Humidifier

The main objective for a steam humidifier is to inject dry steam in a controlled manner into an air stream and distribute the steam, thus insuring it is all absorbed by the air.

How it Operates

Supply steam enters the inlet pipe strainer (1) flows along the top of the steam jacket distribution manifold (2) around the end and along the bottom of the manifold. This is to pre-heat the dispersion tube (8) and prevent condensation. From the manifold jacket, steam flows into the separation chamber (3) via the directing nozzle (4). The condensate separates out and flows to the bottom of the separator chamber where it is discharged through a float trap (5). Dry steam flows from the separator chamber and is regulated through a control valve (6). The dry steam is then discharged through the mesh covered orifices (7) of the steam jacket dispersion tube.

Right: How steam flows out from the steam jacket distribution manifold.



Below: Humidifiers can be custom configured for various vertical and horizontal installations

