

A Fall Furnace Primer Part 2 of 2 - Humidifiers

The winter is cold and dry and our noses, skin, and static zaps on doorknobs remind us of that all winter long. Our homes don't seem to mind the relatively dry environment that winter brings upon us, unfortunately we do not fair as well as our homes do. Humans and other animals need humidity in order to feel comfortable and we often rely on humidifiers to add moisture to our dry house air.

Physics 101

If we asked Einstein what he thought about humidity, he might have said, "it's all relative". Of course, he said that about everything. Humans feel relative humidity. This is the amount of water vapour in the air compared to how much vapour it can hold before it is saturated, which is a fancy way of saying it "feels like rain". For example, if we had a room with 10,000 cubic feet of air with 4 pints of water vapor in it, it may have a relative humidity of 40%. This means we could have 10 pints of water in the air before we saturate the air and get rain or condensation. At this point, the relative humidity would be 100%.

The interesting part is that if you cool down a given amount of air but add no more water vapour, the relative humidity goes up. That's because it takes less water for cool air to feel saturated.

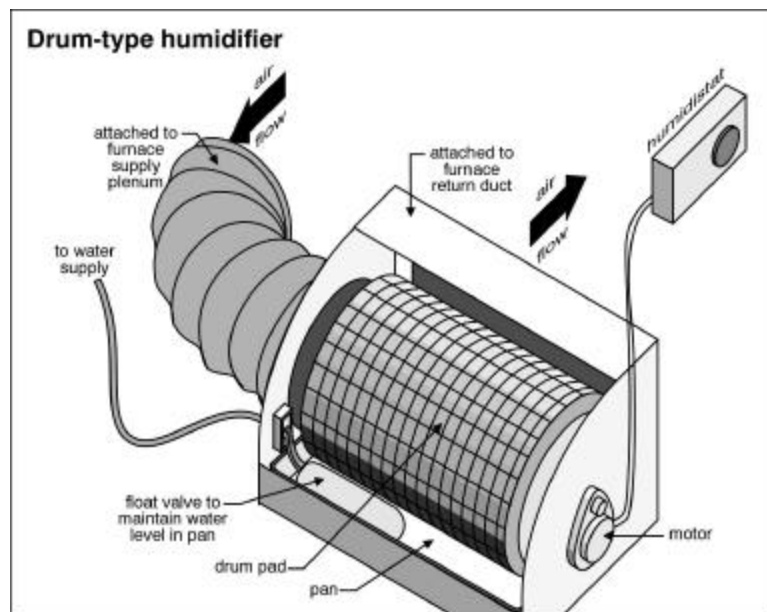
Do I need a humidifier?

If your house is new, you may not have a humidifier yet. You may not need one if this is the house's first winter, as the foundation and wood framing is still drying out, releasing moisture into the air. Also, new houses are "tight", which means the air within them hangs around for a while before being replaced by dry exterior air. It hangs around long enough to pick up moisture from things like showers, cooking, drying clothes and breathing. By comparison, old houses are drafty. Cold, dry air is creeping in all the time, drying out the overall air.

Do I Have One?

If there is a small box hanging off the ductwork beside the furnace with a thin water hose attached to it, then YES. You may also see the humidistat, a dial that looks like the thermostat but is used to control the humidity level, and is often mounted to the basement ductwork.

An old style humidifier has a tray of water with a barrel sponge rotating through it. The tray is



kept full by the water pipe via the float switch. It works like the back of a toilet: as the water leaves, the float drops, causing water to refill the tray. When the humidistat is turned up, the sponge rotates through the tray and absorbs water. Some of the house air blows through the sponge, becoming moist. This moist air mixes with the rest of the air blowing to the rooms.

The new units have no tray of water. The water enters at the top via a small solenoid valve. When the humidistat calls for water, the valve opens, sending water in a cascade down a honeycomb-like metal pad. Air blows through the pad, becoming moist. Any water not picked up by the air drips to the bottom of the unit, where a drain hose takes it into a floor drain, laundry tub, or condensate pump.

There are also fancy steam and spray nozzle type humidification systems. If you have one of those, you will need to call a specialist.

What Do I Do?

If you have an old style unit, the tray of sitting water is your nemesis. Ponding water left to its own devices will cause scale build-up and bacterial growth. Every spring, the water supply pipe valve should be turned off, the tray and sponge should be removed, and the humidistat should be set to OFF. Before use, the tray should be thoroughly cleaned, and the sponge should be replaced. When it's all back together, turn back on the water valve, and set the humidistat to 35% for now. If the water valve is stuck or leaky, have it replaced. Halfway through winter you should turn it all off, take out the sponge and tray, and clean them in soapy, bleached water.

If you have a newer cascade style unit, in the spring you should simply turn the humidistat to OFF, and turn off the water pipe supply valve. Before use, the evaporator pad can be removed and soaked in de-scaling solution to clean it. If it is damaged or too clogged up, the pad can be replaced. The inside of the unit can be wiped clean. Once the pad is back in place, the water supply pipe valve can be turned back on, and the humidistat set to 35%. This unit will not need cleaning again until next year.

How much is too much?

In a house we aim for about 35-60% relative humidity. Unfortunately, houses have a hard time coping with this in cold weather. Too little causes people to feel uncomfortable, and increases concentrations of air pollutants. Too much can cause mould, mildew, and rot to form in walls as warm inside air leaks into cold wall cavities causing the relative humidity to rise to a point of saturation. What strikes most people as counterintuitive is that as winter gets colder, we have to LOWER the humidistat. This is primarily because the colder it is outside, the easier it is for sweat to form on the inside panes of our windows. We can reduce the amount of condensation by lowering the interior humidity level.

Outside	Recommended House Humidity
-20°F	15%
-20°F to -10°F	20%
-10°F to 0°F	25%
0°F to +10°F	35%
+10°F and above	40%
Summer months	Off

Keeping an eye on the amount of sweat on your windows is a great way to gauge your house humidity level. You can track the air condition with a room temperature and humidity monitor, available at many hardware stores.