LRC COIL COMPANY

**Specialty Heat Transfer Products**

Humidity in a Wine Room - Do I Need a Humidifier?

A regular air conditioning system uses a regular txv which lets the coil temperature fluctuate and will typically dry out the air and require a humidifier.

Our evaporators use a constant pressure expansion valve (AXV) which holds the coil at a specific temperature/dewpoint. We normally recommend setting the coil to 38 degrees F and that corresponds to 55% rh in a 55 degree room (you can tune the humidity with the valve). When the air from the house leaks into the room either through the wall/cracks/seams or through door opening the actual moisture in that incoming air is higher on a lb/lb of air basis than the air at 55 degrees even if the relative humidity is the same. So the coil set at it's dewpoint of 38 degrees needs to pull the moisture out of that incoming air for things to remain stable.

The only time a humidifier is really needed is down in the desert during the driest times of the year or up in the mountains (Aspen, etc) where the air is so dry the homes dry out. But a regular house/restaurant that has plants/people/showers/laundry/etc. has more than enough moisture to keep a wine room stable at 55-60%. Only when the home is vacant during those driest times of the year will a home dry out enough to affect the wine room and that's only if it's not been sealed well with a vapor barrier.

A home with 78 degree air and a 50% rh has .0102 pounds of moisture/water per pound of air. A wine room with 55 deg/55% rh has .00502 lbs of water per pound of air. The .00518 lb/lb differential is what must be taken out by the evaporator coil and system to bring the outside air down to 55 deg/55%.

Multiple units on a Single Condensing Unit - It is common to put multiple evaporators on a single condensing unit for a wine room. This is done maybe because of air flow coverage or the need to achieve a larger capacity than is available in a single evaporator. Things to consider with multiple evaporators are line set sizing, balancing of the line set branches and controls. The biggest thing to consider is that the main line set must be sized for the combined evaporator capacity and the branches sized for the individual evaporators.

When adjusting the expansion valve on systems that have multiple evaporators it can be difficult to get things adjusted evenly. There are 2 ways to adjust the AXV.

1. Run the system normally. Disconnect or turn off one of the LLSV's and adjust the other AXV. Reverse the process. Ensure that the system does not overpower the evaporator and skew the pressures being seen.

2. Adjust the AXV's to a pressure lower than the target suction pressure. Run the system, turn off one of the LLSV valves. Shut off the LLSV on the unit to be adjusted and let the system start to pump down. When the pressure is 20 psig or more from the target pressure shut off the compressor and adjust the AXV to bring the pressure up to the target. When the pressure is correct (it may take 1 or more cycles to adjust) then disconnect the LLSV for the unit that has just been adjusted and repeat the process for the other unit.