

# USA COIL & AIR NEWSLETTER

## **Left Hand/Right Hand – Is It Necessary?**

Just about every coil manufacturer makes a big deal out of left hand or right hand coils. Not only do they make a bigger deal out of it than it really is, but they make it confusing besides. The purpose of this Newsletter will be to take the confusion out of the hand designations and make it simple.

### **DO STEAM COILS NEED TO BE RIGHT OR LEFT HAND?**

Not usually. The vast majority of steam coils are “universal”. This means, that because they are 1 or 2 rows deep, you can reverse them and put the connections on either side of the coil. The important thing is to feed the top connection (supply) and return the condensate out of the bottom connection (return). Most steam coils have the return connection as low as possible, so as not to trap condensate in the coil. When you flip the coil from right hand to left hand, the connection arrangement will always look the same in either direction for most arrangements. For those arrangements where it doesn't look the same, always feed the highest connection and return the lowest connection. Hand is usually not important!

### **DO HOT WATER COILS NEED TO BE RIGHT OR LEFT HAND?**

By definition, a hot water coil is 1 or 2 rows also. Again, because you can reverse the coil from right to left and make the connections look identical, these coils are “universal”. For those rare cases, where they don't look identical, always feed the bottom connection and return the top connection. This is the exact opposite of steam coils.

### **WHAT COILS DO REQUIRE A ‘HAND’ DESIGNATION?**

Any cooling coil that is 3 rows or larger. It doesn't matter whether it's a chilled water coil or a DX coil. Also, all condenser coils require this designation. All coils (except steam) need to be counterflow, and 3 rows and above especially need to be counterflow.

### **WHAT IS COUNTERFLOW?**

A coil is an air to fluid heat exchanger. Air is traveling on the outside of the tubes and fluid (steam, water, refrigerant) is traveling on the inside of the tubes. One of the main principles in designing any heat exchanger is to keep the air and the fluid in a counterflow condition. This means that they travel in opposite directions through the exchanger. You always want the water, refrigerant, etc. entering on the side of the exchanger where the air is leaving. This means that as the air goes from left to right, the fluid is traveling from right to left – that is, they are going in opposite directions. This is the way that all coils are tested, and gives you optimum performance. When you pipe

a coil backwards (with no counterflow) then you can lose up to 15% of performance. This is the real reason that coils are designated right hand or left hand. The idea is to get the piping to the proper connections and maintain counterflow. On a 1 or a 2 row coil (steam or hot water), counterflow makes very little difference. On 3 thru 10 row coils, it makes a major difference.

### **WHAT IS HAND AND HOW DO WE DETERMINE IT?**

When you stand in front of a coil, the connections will either be on the right side or the left side. This is what we mean by “hand” connections – right or left. Connections that are right hand when facing the entering air side of the coil are left hand when facing the leaving air side of the coil. Which is correct? Well, they both are correct and that’s what makes this whole thing confusing. USA Coil & Air always faces the entering air side of the coil to determine its hand connection. As an example of a company that does it differently, Trane faces the leaving air side of the coil to determine its hand. The important thing to know is how a chilled water coil should be piped, and not some individual company policy about right or left hand. When you walk around to the end of any coil and the connection stubs are pointing at you, the supply connection should always be at the bottom, leaving air side of the coil. The return connections should always be at the top entering air side of the coil. This is the correct piping arrangement and is counterflow to give you optimum performance. The air travels through the coil in one direction, and the fluid travels in the opposite direction.

### **IS THERE A PROPER HAND FOR REPLACEMENT COILS?**

Yes there is, but you don’t really need to know it. When you are replacing any chilled water coil, all you need to do is walk around to the end of the coil and look at the connections. Almost always, the connections are at the bottom right/top left, or the opposite, bottom left/top right. Hand orientation or designation is not important anymore. It’s either bottom right/top left or bottom left/top right and the contractor will hook up the piping whatever way it was hooked up previously. You just have to match up what was there in the first place.

As a general aside, many existing coils are piped incorrectly and when replacement time rolls around, it’s necessary to point out that a particular coil may not be counterflow. The contractor or maintenance engineer’s response may be “So what!” It’s worked this way for y ears!” In that case, give them what they want, and forget about doing it the right way. It may cost them more to change the piping than the coil is worth. Just tell yourself “bottom left/top right” or “bottom right/top left” and however they pipe it up is up to the customer. Hand connection is a difficult concept, because most coil manufacturers make it more difficult than it has to be. Just remember the few basic rules and it gets a lot easier.



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