STERLING®
COMMERCIAL HYDRONIC PRODUCTS

PANEL RADIATOR
SAME END PIPING CONNECTIONS

One of the most commonly asked questions by installers and Sterling representatives is: “Does it really matter if a same end pipe connection radiator is piped with the supply at the top, or can the supply be piped at the bottom connection?”

The simple answer is “Yes, it does matter” and “No, don’t put the supply into the bottom pipe connection.” I suspect that the question gets raised in the first place because installers are used to piping coils with the supply at the bottom and the return at the top. This is great for coils, but Sterling panel radiators are not coils. The water does not run through a Sterling panel radiator like it runs through a coil. Air does not pass through a Sterling panel radiator like it does through a coil.

Let’s look at the air side of this first. Unlike a coil, where the air is heated by being pushed through the coil front to back, a Sterling panel radiator is like a plate heat exchanger: the air flow is bottom to top, running parallel with the tube face. The most efficient heat exchange is counter flow heat exchange, and that’s what you get when you pipe a Sterling panel radiator with the supply water in the top and the return at the bottom. The hottest water is in the top of the radiator with the coolest water at the bottom; while on the air side the coolest air is at the bottom with the warmest air at the top.

Now let’s look at the water flow inside of the radiator. As you can see from figure #1, there is a baffle on the supply end which separates the supply tubes from the return tubes. However, by design, this baffle is not completely sealed. As can be seen from Figure #2, there are tiny weep holes which allow air trapped beneath the baffle to bubble up to the supply tubes. From there, the air is pushed towards the vent, where it can be eliminated.

As you can see from the incorrectly piped radiator in Figure #1, the flow of water pushes the air away from the vent. If a control valve stops the flow of water, it is possible to build up enough air to form a blockage. The installer can bleed water out of the vent, and assumes he does not have an air problem, but no amount of bleeding will get rid of this air blockage. Air blockage is not a really common problem with a single same end piped radiator, but when we do get calls about it, we almost always find that the radiator has been piped incorrectly.

Air blockage occurs much more frequently in a two or three radiator same end series, as illustrated in Figure #3. When piped correctly, any air in the top tubes is pushed towards the vent and any air in the bottom tubes bubbles up through the weep holes and again is pushed towards the vent.

But, when piped incorrectly, air blockages can occur, most typically happening at the outlet of the second or third radiator in series. In this case, another interesting thing happens. Since the water cannot flow through the blocked radiator(s), it will build up enough pressure to flow through the first (or first and second) radiator’s weep holes. Enough flow goes through so that the first (and perhaps the second) radiator get warm, depending on whether the blockage occurred in the second or third radiator.

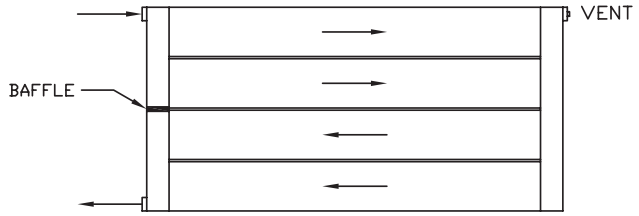
The installer vents the third radiator and nothing but water comes out, so he assumes Sterling built a bad radiator, and he calls you to complain.

The last thing he wants to hear is that he needs to repipe the radiator according to Sterling’s recommendations, but I will guarantee you that if an air blockage happens once, it will probably happen at the beginning of every heating season if the piping is not corrected.

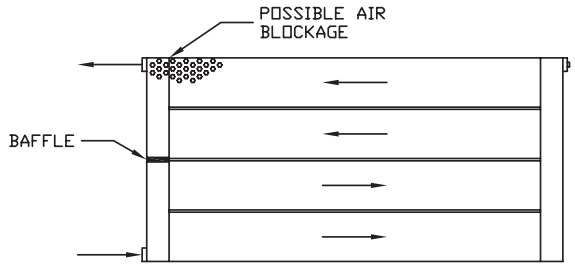
Please make sure your installer knows the correct way to install same end piped radiators. Do not let him talk you into doing the incorrect way. If you do, you will have a good chance of a future problem, and you’ll certainly have a little less output.

RADIATORS WITH SAME END PIPE CONNECTIONS

SINGLE RADIATORS



CORRECT



INCORRECT

FIGURE #1

BAFFLE DETAIL

VIEW FROM TOP OF HEADER

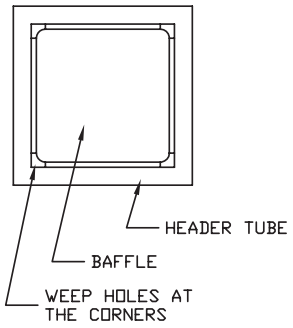
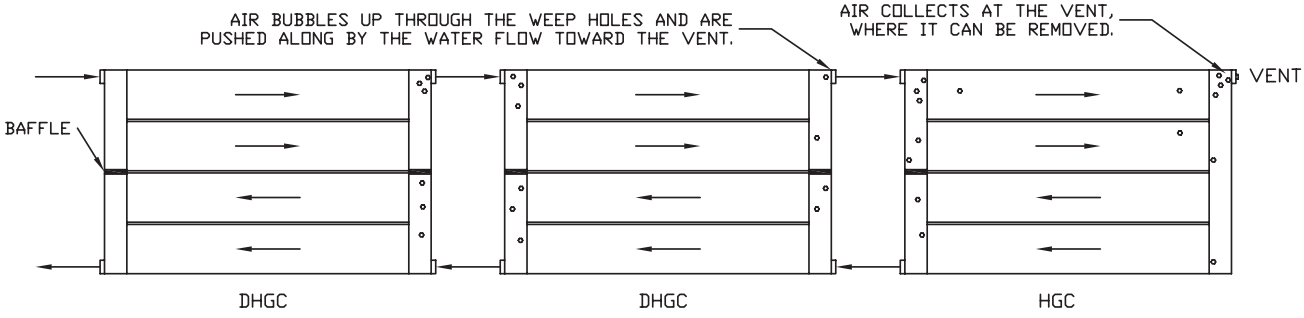


FIGURE #2

SAME END SERIES RADIATORS



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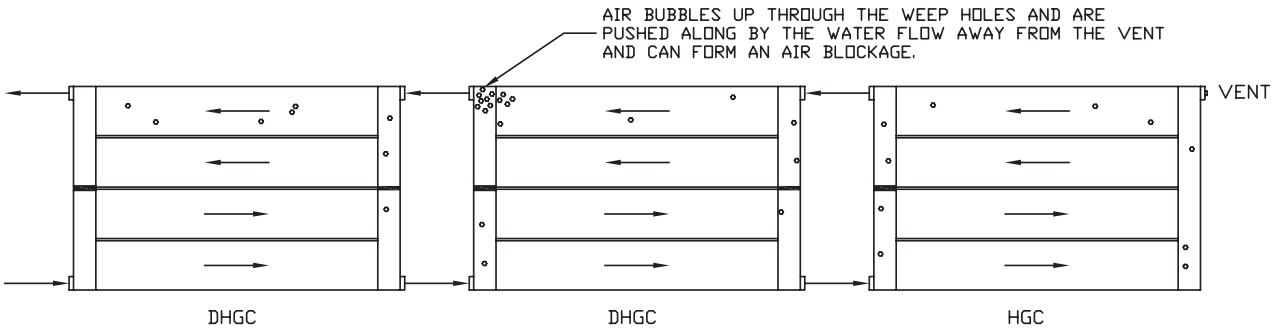

INCORRECT

FIGURE #3

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