

## Dealing with “Ghost Flows” Can be Scary

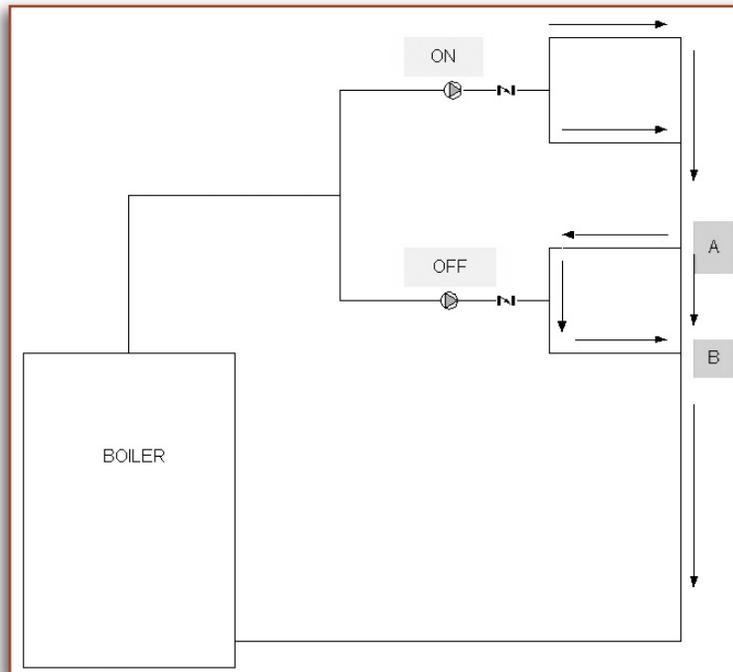
A “ghost flow” delivers heat to a terminal unit when there isn’t supposed to be any flow at all – even when the room thermostat is satisfied. To learn why this happens, read on.

Ghost flows can occur in a hydronic heating system when a pressure differential exists across an open circuit, allowing water to flow where it doesn’t belong. Here’s an example of a complaint about overheating:

A heating contractor had replaced a boiler over the summer for a new customer. The contractor did not spend a lot of time looking at the entire piping system – he saw just the piping in the boiler room.

He pulled out the old boiler, installed the new one and attached the existing piping in the same manner as it had been piped originally.

When the heating season came, the homeowner called to complain that several zones were overheating. The heating contractor sent one of his service technicians over to the house. He checked to make sure the flow-control valves were working. He made sure that each thermostat was wired properly to its respective relay and circulator. Everything appeared to be in good working order. Next, the technician went upstairs and checked the room temperatures compared to the thermostat settings of the zones that were overheating. He found that each overheating room’s thermostat was set at 60°F, but the room temperature was actually 75-76°F. At this point, the service technician called in the local Bell & Gossett Representative to look at the job. After several questions and discussions, the homeowner admitted that “maybe” the same problem had existed with the old boiler. He explained that when



ceiling and back to the boiler. Looking at the sketch, you can see that when one zone is calling for heat, the water that enters the return main manifold has access to flow in the return of an off zone.

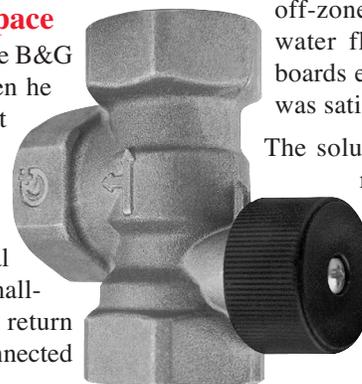
Note the two returns (A and B) from one of the overheating zones. When the water flows along the return main and reaches point A, it asks itself, “which way do I go”? The answer depends upon the difference in pressure between points A & B. Because there is a difference in pressure between these two points, some water has to flow up the return, moving backwards through the off

zone and back down to point B. This is what caused the overheating to occur. The off-zones constantly had some water flowing through the baseboards even though the thermostat was satisfied.

### A clue in the crawl space

Here is a sketch of what the B&G Representative found when he inspected the basement looking for clues:

The system had eight heating zones, each with its own circulator. Several of these zones split into smaller, sub-circuits, and each return from these sub-circuits connected into the common return manifold. What was interesting about this particular system - and what made it more difficult to troubleshoot – was that the main return manifold that picked up all the sub-circuit returns was in the crawl space between the first floor ceiling and the second floor. All you could see in the boiler room was the supply manifold with all the zone pumps and flow-control valves, their individual take-offs, and the return main that came down through the



Hydrotrol™ Flow Control Valve

The solution is to combine all the returns from each zone pump together before entering the return main. But in this case, with all the piping concealed in the first floor ceiling, it was necessary to install small spring flow control valves (Hydrotrol™) on the returns of each baseboard circuit. After this was done, the ghost flows disappeared.

**Remember, if you have any hydronic questions or problems, who ya gonna call? Your local Bell & Gossett Ghostbuster. They have solutions to all of your hot water heating problems.**