

Combining Outdoor Boiler Reset with Outdoor Mixing Reset – TD04

EFFECTIVE: 08.03.2015

SUPERSEDES: 03.1.2004

In radiant applications Mixing Reset should be combined with Outdoor Boiler Reset to achieve optimum comfort and control throughout the entire system.

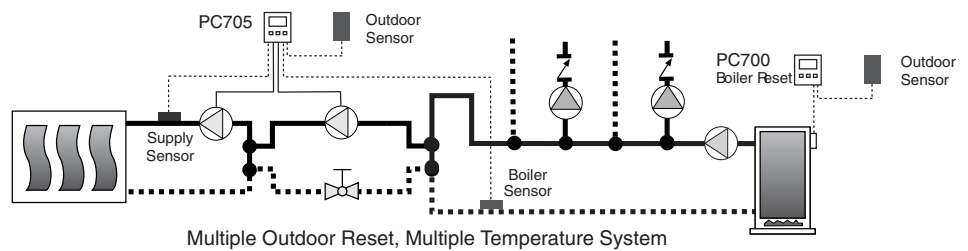
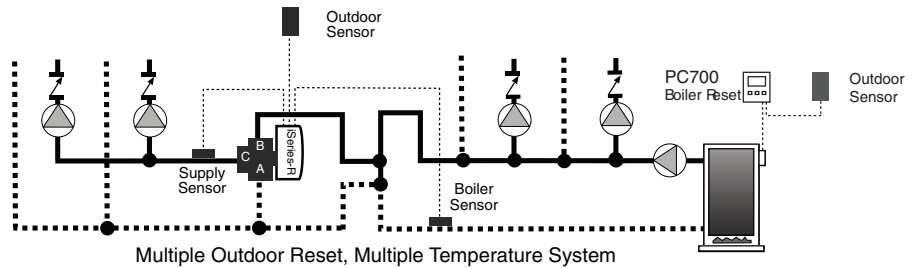
Outdoor Boiler Reset controls, like the Taco PC700 or PC702 takes over the boiler operation from the high limit control. As the outside air temperature changes, the outdoor reset control continually adjusts the boiler supply water temperature by cycling the boiler on and off. Using this approach, the heat loss from the building is matched by the heat provided to the building.

Outdoor Boiler Reset is well suited for high temperature hydronic systems, such as baseboard. When used in mixed temperature or lower temperature radiant applications, outdoor reset is only partially effective, especially when combined with a conventional boiler that should not operate at low temperatures due to flue gas condensation. In cases like this, the boiler water is only partially reset based on a minimum boiler supply setting within the control. The typical minimum setting is 130°F for the boiler. In a large percentage of the United States supplying 130°F is higher than necessary to heat a house during much of the heating season. That is why a room thermostat is required. It acts as a high limit control based on the rooms air temperature to shut the heating system off.

In radiant applications the benefits of outdoor reset can be extended to the entire system by using a mixing device, with integral outdoor reset, located between the boiler loop and a separate distribution loop. The mixing device could be a standard 00 circulator controlled by a PC705, 00-VR Variable Speed Outdoor Reset “00” Circulator or an iSeries-R (Outdoor Reset) Mixing Valve. The chosen device operates to deliver the proper supply water temperature to the distribution loop while monitoring outdoor temperature, this is called Mixing Reset. Mixing Reset allows for much deeper reductions in the water temperature supplied to the distribution loop. Water temperatures can even approach room air temperature during certain times of the year.

Outdoor Boiler Reset adjusts the temperature for the primary loop, while the Mixing Reset further adjusts the temperature for the distribution loop. The combination of the two methods reduces heat loss from the primary loop piping, improves loop stability during reduced load conditions, increases reaction time to load changes, reduces on/off cycling, and improves efficiency as well as overall comfort.

Note: Built-in boiler protection or appropriate by-pass piping is also necessary to prevent any thermal shock or flue gas condensation. See *Simplify Boiler Protection* (Technical Document TD02).



Product & Application Documents:

- PA01 – PC700 Outdoor Boiler Reset Control and PC702 Two Stage Outdoor Boiler Reset Control
- PA02 – PC705 Variable Speed Injection Mixing Control
- PA03 – Variable Speed Outdoor Reset “00” Circulator (00-VR)
- PA04 – iSeries-R (Outdoor Reset) Mixing Valve
- PA09 – Radiant Mixing Block

Operating Mode Documents:

- OM02 – Outdoor Mixing Reset: Variable Speed Injection Circulators
- OM03 – Outdoor Mixing Reset: 2-Way / 3-Way / 4-Way Mixing Valves
- OM04 – Zone-by-Zone Outdoor Mixing Reset

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