

## PROBLEM

Thermostatic 3-way mixing valves are the best-known and most widely used way of reducing temperature in a hydronic system. That's because the valves have been around for so many years and are sold by numerous companies. Taco's invention of the tankless water heater in the 1930's was so successful in producing abundant amounts of hot water that the tempering was developed shortly thereafter. Since that first "Type A" tempering valve Taco has offered a number of versions as technology has changed, including the current 5000 Series Mixing Valve.

Given the valve's long history it was inevitable that they were applied to radiant heating applications, especially as a replacement for the early European 4-way control valves. The contractor was comfortable with the valve and knew how to install it in hydronic heating and water heater tempering applications. However, the application of thermostatic 3-way valves to the radiant market has its inherent shortcomings, since it offers no protection against thermal shock or flue gas condensation within the boiler. To get the required protection in radiant systems, a second 3-way thermostatic valve needs to be installed, as per Figure A.

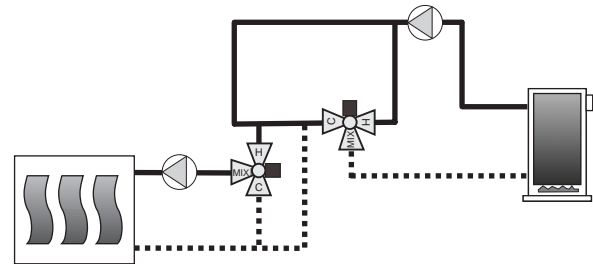


Figure A

## SOLUTION

The Taco iSeries Mixing Valves are the first product that addresses the shortcomings of 3-Way thermostatic valves in radiant applications by providing precision temperature control along with protection against thermal shock and flue gas condensation within the boiler.

The iSeries Mixing Valves are available in 2-way mixing or 3-way injection configurations. The two versions of the valve provide either outdoor reset control (iSeries-R) or a fixed water supply temperature (iSeries-S). A microprocessor control is built into the valve actuator, to which all wiring connections are made. The iSeries Mixing Valve modulates in order to inject different rates of hot water into the cool system return water. This allows for virtually any water temperature to be supplied to the heating system.

The protection against thermal shock and flue gas condensation is achieved by installing the boiler return sensor, see Figure B. Minimum temperature, based on the type of boiler being used, is selectable through dip switches on the valve. The iSeries monitors the boiler return temperature and modulates the valve down when the return temperature is near the minimum setting. This increases the flow of hot water from the boiler loop back to the boiler.

Next time you think about using 3-way thermostatic valves in a radiant application, remember to either use multiple valves, as shown in Figure A, or replace them with one iSeries Mixing Valve to deliver the optimum zone-by-zone temperature control, with built-in boiler protection.

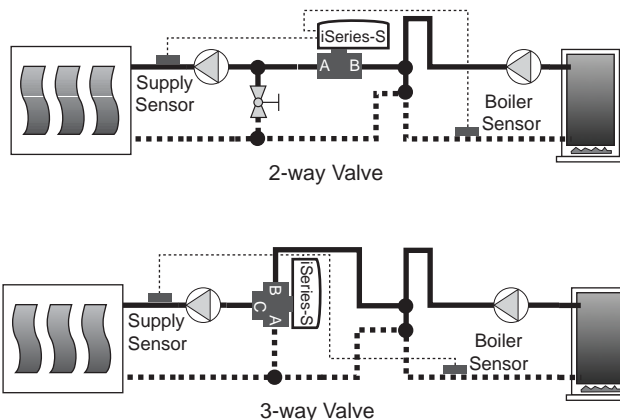


Figure B

### Product & Application Documents:

- PA04 - iSeries-R (Outdoor Reset) Mixing Valve
- PA06 - iSeries-S (Setpoint) Mixing Valve
- PA07 - 5000 Series Mixing Valves

### Operating Mode Documents:

- OM03 - Outdoor Mixing Reset: 2-Way / 3-Way / 4-Way Mixing Valves
- OM04 - Zone-by-Zone Outdoor Mixing Reset
- OM06 - Setpoint Temperature: 2-Way / 3-Way / 4-Way Mixing Valves

## ADVANCING RADIANT

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Check out *Go All the Way: Zone-by-Zone Outdoor Reset* (Technical Document TD05) for all the benefits of zone-by-zone outdoor reset that can be achieved with the iSeries-R valves.

### **Radiant Made Easy™**

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