

Pumps vs. Valves for Injection – TD06

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VALVES OR PUMPS FOR INJECTION? YOU CHOOSE

We mean it, it's your choice. Granted, we are in the enviable position of being able to provide products with the Taco name on them no matter what you choose. So maybe we can be a little less biased and present the reasons why installers have decided to do it one way or the other.

In a conventional heating system some people like to use a pump on every zone or one larger pump with multiple zone valves. Depending on the choice, piping, wiring and accessory product selection needs to vary. But if done properly there are a host of design methods that yields an efficient comfort system. History, innovation and geographic location also play a large role in installer's method selection. Less because of altitude or temperature and more because of their desire to use what worked the last time for them or one of their peers. Experience becomes the prime design force.

Similarly, when the popularity of radiant systems started to increase in North America, 4-way mixing valves were the norm. This was because the valves were the most popular method used by European installers at the time. Since all of the major radiant tubing manufacturers came to the US with European roots, the system design methodology that was first taught centered around the European "standard" 4-way mixing valve. As more and more systems were installed in North America better controls were introduced (i.e. Taco PC705) to vary the speed of fractional horsepower circulators (our "standard" hydronic equipment). Injection mixing using circulators has increased significantly as installers have improved the conventional system design methods of fifteen years ago by utilizing methods such as pumping away, primary / secondary piping or installing boiler reset controls.

Until now, to control the injection pump or mixing valve an external control had to be used that everything hooked up to. With the introduction of the Variable Speed "00" Circulators and iSeries Mixing Valves the complete control system is integral to the product. All the wiring is done directly to the pump or iValve; power, sensors, everything. So once again innovation has brought us back to the initial question. Once you decide to innovate, will it be with a pump or valve?

What You Get No Matter Which Product You Choose

- Full or partial reset of the supply water temperature based on outdoor reset
- Boiler Protection
- Full PID microprocessor based control of the water temperature
- Pump / valve exercise
- Temperature accuracy

Why Some Installers Prefer Pumps

- More flow (heat transfer) through a pump, especially on larger systems*
(*Compared to a similar connection sized valve)
- Can size pump to match loop requirements
- Usually easier to find parts / replacements
- Can use "standard" pump (i.e. 007) and then use a balancing valve to get the pump into the correct operating range
- Has been more difficult (before the release of the iSeries Mixing Valves) to provide boiler protection with valves
- Has held a first cost (product cost and installed cost) advantage over 4-way valves

Product & Application Documents:

PA02 – PC705 Variable Speed Injection
Mixing Control

PA03 – Variable Speed Outdoor Reset
"00" Circulator (00-VR)

PA04 – iSeries-R (Outdoor Reset)
Mixing Valve

PA05 – Variable Speed (Setpoint) "00"
Circulator (00-VS)

PA06 – iSeries-S (Setpoint) Mixing Valve

PA09 – Radiant Mixing Block

Taco Product Catalogs:

100-3 – Heat Motor Zone Valves

100-7.7 – ESP Zone Valve

100-8.5 – "00" Series Cartridge Circulators

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

OM05 – Setpoint Temperature: Variable Speed
Injection Circulators

OM06 – Setpoint Temperature: 2-Way / 3-Way /
4-Way Mixing Valves

Why Some Installers Prefer Valves

- No balancing (throttling) needed with 3-way and 4-way valves
- Can manually open valve to force flow through the loop
- Low voltage wiring
- Lower energy cost (although other things, like outdoor boiler reset can effect energy a lot more than the small % difference of operating a variable speed pump vs. a valve)
- History. Started using 4-way valves in early systems coming from Europe
- Can design the main boiler loop to be constant circulation (primarily used on larger systems)
- In some cases the boiler loop pump can be eliminated when the 4-way valve is located close to the boiler and is not one of several zones supplied by a common boiler pump
- Easier to install
- 4-way valves have been preferred on conventional boilers over 2-way or 3-way valves because full flow through the boiler is assured regardless of the valves position. Whatever volume of boiler water that has not been diverted to the zone warms the return water to the boiler. This helps protect against flue gas condensation. Full boiler protection is achieved when the valve's actuator is connected to a return water sensor (standard on iSeries Mixing Valves) to modulate the valve's position based on the sensor feedback.



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