



HVAC Tech Note #5 – April 2003

Sizing Check Valves

We've all heard chattering check valves in HVAC systems, and it will almost always be because the valve is too big. All check valves require some minimum pipe velocity to keep the valve disc or flapper fully open. Valves that are too big will be noisy in operation, and will experience premature wear of the moving parts.

The Crane Technical Paper No. 410 lists formulas for calculating the minimum pipe velocity required for full disc lift in different types of check valves. For example, standard threaded swing check valves require a minimum pipe velocity equal to 35 times the square root of the specific volume of the fluid. For water, that equates to just over 4.4 fps, or slightly higher than the design guidelines used for small diameter pipe in HVAC systems. Use a valve smaller than line size to get longer valve life and quieter operation. Quite often there will be some other device in the system smaller than line size, like a pump or control valve. Placing the check valves adjacent to these components will reduce the number of fittings required to accommodate the correct size of valve.

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