



MILWAUKEE VALVE

PRODUCT BULLETIN

CHECK VALVES- Minimum flow rates and installation locations

In the interest of reducing field related installation problems, Milwaukee offers the following technical information regarding check valves:

Swing check valves require a **minimum amount of flow**, so that the valve functions correctly. If the flow through a check valve is not sufficient to hold the disc in a full open and stable position, the disc and associated internal parts will be in a constant state of motion (wobble). This type of installation results in premature wear, noisy operation, and vibration.

The solution to this problem is flow. A general rule of thumb for water systems has been to maintain a minimum of 7.5 ft/sec flow rate. When it is difficult to maintain that flow rate, it is sometimes recommended that the line size be reduced.

In piping systems containing other types of fluids, the flow requirements vary with the specific gravity of the media. The following formula can be used to approximate the minimum flow rates.

$$\text{Flow}_{\min} \text{ (ft/sec)} = 60 \sqrt{V}$$

V = specific volume of fluid (ft³/lb)

Silent check valves such as our Figure #1400 (Wafer) and #1800 (Globe) have slightly different flow requirements. Spring loaded silent check valves are designed to provide a cracking pressure of 0.5 psi and to fully open at a 4 ft/sec flow velocity.

All check valves should be installed in a location that has smooth and laminar flow conditions. The following general rules exist for check valve installations:

- 1) Downstream of a reciprocating pump or other turbulence inducing device (elbow, tee, etc):

Swing Type: **Locate valve a minimum of 10-12 diameters downstream of the device**

Silent Type: **Locate valve a minimum of 4-5 diameters downstream of the device**

- 2) Pipe fittings, elbows, reductions, etc. downstream of the valve:

Swing Type: **Locate elbow a minimum of 5-7 diameters downstream of the valve**

Silent Type: **Locate elbow a minimum of 2-3 diameters downstream of the valve**

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