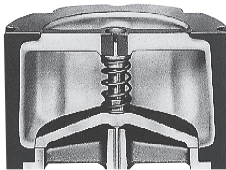


# Positive Protection Against Water Hammer

## Reasons For The Development Of Silent Check Valves



Screwed End



Compact Wafer Type



Wafer Type



Globe Type

Water hammer is a common problem experienced in systems where swing check valves are used to prevent reverse flow to a pump. Theoretically, a swing check installed downstream from a pump will close when the pump shuts down or when the closure of a valve farther down the system stops flow. This closure is not quick enough, however. A reverse flow will cause the disc to slam against the valve seat, creating noise and piping stresses through vibration and an energy wave in the piping.

Water hammer can be so severe as to rupture pump casings, expand and rupture piping, and cause major vibrations throughout the system and the buildings that may contain that piping.

Additionally, swing check valves function in a manner similar to a door hinged at the top rather than the side. A great deal of force (flow) is required to lift the disc into the fully open position.

Silent check valves were developed to eliminate these problems and are so named because they will operate efficiently and silently when installed. Their spring-assisted design insures that the disc returns to the closed position before a reverse flow condition occurs.

### Design

Mueller Steam Specialty Silent Check Valves of all designs have been carefully engineered to incorporate features not found in other manufacturers' silent check valves.

All Mueller Silent Check Valves are designed to open at .5 pound per square inch on the disc, and will be fully open at a minimum velocity of 12 ft. per second. Refer to the appropriate Pressure Drop Charts in the Technical Data Section for specific flow information by valve type and size.

Most silent check valves are designed so that the disc lifts  $\frac{1}{4}$ " for each inch of nominal pipe size. In a 4" valve, the disc will lift 1". Mueller Steam Specialty Silent Check Valves are designed to exceed this industry rule of thumb. The design dictates that the disc will lift  $\frac{1}{3}$ " per inch of nominal pipe size, resulting in a 33.3% increase in the fluid that can pass between the disc and the seat. This can be a critical improvement in high flow and high velocity applications.

The minimum open area in the body is equal to 110% of the area of the corresponding pipe size. This also improves flow through the valve.

The discs are double guided to provide positive seating and to eliminate fluttering.

Discs and seats are individually lapped to ensure a positive seal.

Mueller Steam Specialty Silent Check Valves are available in both the wafer and globe design bodies. Wafer bodies feature a short face-to-face design so are light and compact where these features are needed. Globe style bodies feature integral flanges for installation, and feature a larger body section to enhance and streamline flow, resulting in lower pressure drops and higher flow coefficients. Both styles are available in a complete range of sizes, body and trim materials, and pressure ratings. A screwed end version is also available in a variety of material combinations.

### Application

Mueller Steam Specialty Silent Check Valves may be used in vertical and horizontal installations. They can efficiently and silently replace problematic swing or lift checks.

These valves are not suggested for sewage ejector piping systems.

As with most check valves, maximum performance and service life can be expected if the valve is installed five to ten pipe diameters away from turbulence-producing devices such as pumps or elbows.

Proper sizing is critical for optimum performance. Please consider all of the operating conditions in the piping system when selecting the valves. See Important Ordering Information following, or Consult factory for assistance in choosing the proper valve for the application.

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