

How It Works

Ball Valves

A ball valve is a device with a spherical closure unit that provides on-off control flow. The Sphere has a port, also known as a bore, through the center. When the valve is positioned such that the bore is aligned in the same direction as the pipeline, it is in open position and fluid can flow through it. When rotated 90°, the bore becomes perpendicular to the flow path, meaning the valve is closed and fluid cannot pass through.

Ball valves, along with butterfly and plug valves, is part of the quarter turn valve family. Ball Valves are known for reliable, bubble-tight sealing and thus are ideal for gas applications where tight shutoff is critical. Due to the potential of constant wearing on the seats, ball valves are not recommended for throttling applications. The body of a ball valve is usually made of steel and can be coated with nickel plating.

The most common ball valve design is two way, which enables flow to linearly travel from the inlet to the exit. Three and four way ball valves enable flow travel in multiple directions, including 90° angles.



Types

Trunnion-mounted ball valves

Have additional mechanical anchoring at the top and bottom on the ball. This special mounting is suitable for larger and higher-pressure valves. Moreover, this design supports the ball in two places, which reduces valve torque. The trunnion-mounted stem absorbs the thrust from the line pressure, preventing excess friction between the ball and seats so that even at full rated working pressure, operating torque remains low.

Floating Ball Valves

Are not held in place by a trunnion and instead are attached only to the stem. This can cause the ball to float slightly downstream. However, when this happens, the ball presses against the seat, creating a positive seal.

Rising stem ball valves

Incorporate tilt-and-turn operation, eliminating seal rubbing – one of the primary causes of valve failure. When the valve is closed, the core is wedged against the seat, ensuring positive shutoff. When the valve is open, the core tilts away from the seal, and flow passes uniformly around the core face. Rising stem ball valves employ this operating principle, delivering fast, low-torque operation and long-term reliable performance. Additionally, the valve is able to eliminate localized high-velocity flow, which typically creates uneven seat wear in ordinary ball, gate and plug valves.

Full-port (fullbore) ball valves

Have a bore ID that is approximately equal to the pipeline ID. This helps reduce friction and pressure loss across the valve, there is no restriction to the flow, but the valve can be more expensive. This type of bore is ideal for situations that can require pigging. Our portfolio in these valves includes split-body, full-port, flanged ball valves that represent the cumulation of sealing technology and design expertise with the versatility to solve even the most demanding applications. These valves are widely used in the chemical, petrochemical and refining industries.

Reduced-port (reduced-bore) ball valves

Feature a bore that is reduced by one or two nominal sizes. This provides a more restricted flow path, generally resulting in higher energy loss. These Trunnion-mounted ball valves are available in both full and reduced port valves. Known for their robust design, superior sealing areas and stainless steel overlays, reduced-port valves are widely recognized as a leading valve solution for severe service applications.

V-port ball valves

Have a V-shaped ball or seat. This type of valve is also known as a control valve in which the flow velocities need to be controlled as required per the application.

Applications

Ball valves can be used in a variety of applications and markets, such as transmission and storage, has processing, industrial and many more. These valves provide reliable leak protection, which is especially beneficial in gas applications, exhibit low pressure drop and fast open and closing.

A variety of construction materials, trim options and designs make these valves extremely versatile.