

Engineered Protection for High Integrity Pressure Protection Systems

APPLICATION

High Integrity Pressure Protection Systems (HIPPS) are independent protection layers designed to prevent overpressure events in upstream, midstream, and downstream oil & gas facilities. As part of a Safety Instrumented Function (SIF), HIPPS isolation valves must provide **rapid, repeatable closure with a high probability of successful demand** while conforming to IEC 61508 / IEC 61511 functional safety lifecycle requirements.

Bray's HIPPS-compliant solutions utilize **Tri Lok® triple-offset butterfly valves** and **Series 1B trunnion-mounted ball valves**, engineered with **high-speed pneumatic actuation** and **SIL-capable safety accessories**, to support **SIL 2 and SIL 3 architectures** with documented failure data, traceability, and validation support suitable for TÜV-reviewed applications.

VALVE OPERATING CHALLENGES

- > **Fast Valve Closure Times**
 - Closure performance must meet defined requirements, often in the sub-second to low-second range.
- > **Functional Safety & SIL Compliance**
 - Valve, actuator, and accessories must support SIL 2 and SIL 3 verification through validated failure data, architectural constraints, and proof test strategies.
- > **High Differential Pressure & Torque**
 - Isolation valves must maintain stable, predictable operation under full differential pressure with adequate torque margin.
- > **Reliability & Spurious Trip Avoidance**
 - Components must be proven-in-use or certified to minimize nuisance trips while maintaining demand reliability.
- > **Severe Service Environments**
 - HIPPS valves are frequently installed in hazardous, outdoor, or corrosive environments requiring robust materials and global certification.



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BRAY HIPPS PRODUCT SOLUTIONS

Working closely with EPCs, end users, and functional safety specialists, Bray delivers engineered HIPPS valve assemblies designed to meet fast-closing, high-integrity safety requirements. Each solution integrates the valve, actuator, and safety accessories into a coordinated package supported by application engineering, documentation, and lifecycle services.

1 TRI LOK TRIPLE-OFFSET BUTTERFLY VALVE

- > **Metal-Seated, Zero-Leakage Design:** Triple-offset geometry provides repeatable tight shutoff without seat friction or galling during high-speed operation.
- > **Optimized for Large Line Sizes:** Favored for larger diameters where fast stroking and manageable actuator sizing are critical.
- > **Fire-Safe & Fugitive Emissions Qualified:** Supports HIPPS fire-case and environmental requirements, API 607, ISO 15848-1 certified.
- > **Wafer, Lug, and Double-Flanged Configurations:** Flexible integration into new and retrofit systems.

2 SERIES 1B TRUNNION-MOUNTED BALL VALVE

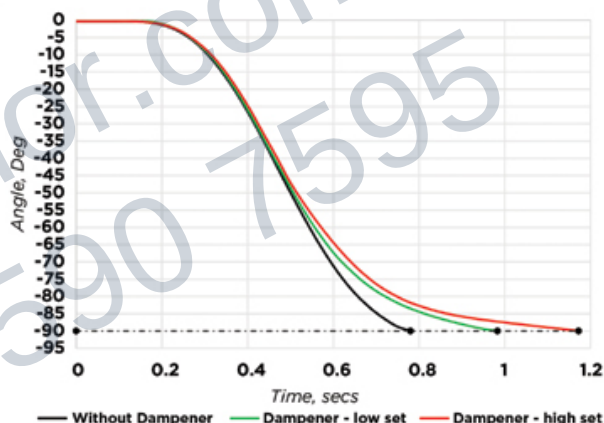
- > **API 6D Platform:** Proven isolation valve design widely accepted in safety and pipeline services.
- > **Soft- or Metal-Seated Options:** Configurable based on leakage class, media, and HIPPS service severity.
- > **High Differential Pressure Capability:** Trunnion support and seat design ensure stable closure under full ΔP .
- > **Fire-Safe & Fugitive Emissions Qualified:** Suitable for hydrocarbon safety applications. API 6FA, ISO 15848-1 certified.

HIGH-SPEED PNEUMATIC ACTUATION

- > **Fail-Safe Spring-Return or Double-Acting Designs**
- > **High-Capacity Air Flow & Exhaust**
- > **Oversized Torque Margins**
- > **Severe Service & Low-Temperature Options**
- > **Integrated Dampener for Improved Repeatability**

FUNCTIONAL SAFETY ACCESSORIES

- > **SIL-Capable Single or Redundant Solenoid Valves**
- > **Quick Exhaust Valves**
- > **Partial Stroke Testing (PST) Devices**



Closing profiles illustrating adjustable damping impact



KEY BENEFITS

- > **Technology Flexibility:** Butterfly and trunnion ball valve options to align with SIF and process requirements
- > **Validated Fast-Acting Performance:** Engineered to meet defined HIPPS response times
- > **SIL-Oriented Design Support:** Failure data, documentation, and architectural guidance available
- > **Reduced Spurious Trips:** Proven components and optional redundancy
- > **Global Bray Support:** Engineering, manufacturing, testing, and lifecycle support

For more information about solutions for the Oil & Gas industry, contact your local representative or visit [Bray.com](https://www.bray.com).