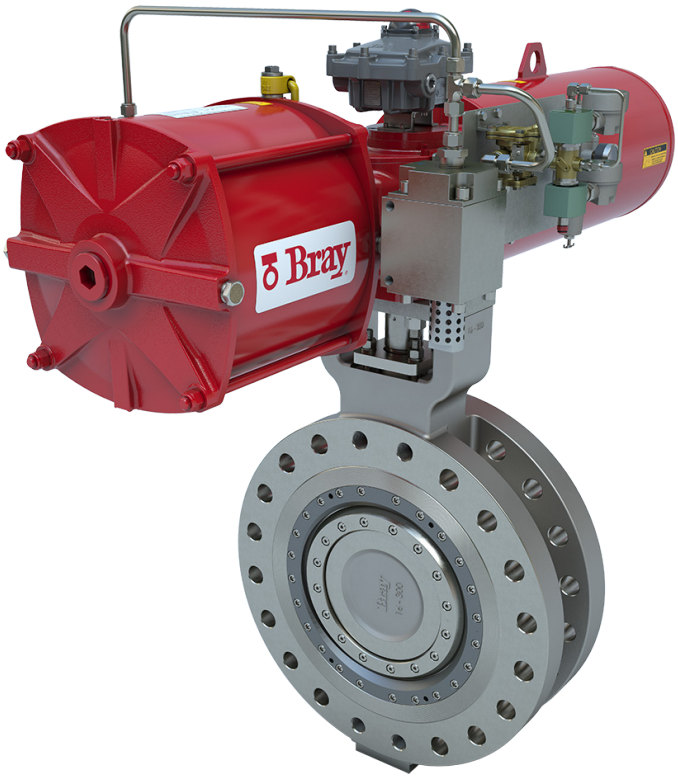
Engineered Protection for High Integrity Pressure Protection Systems

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.

Continue to next page for Bray solution.

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

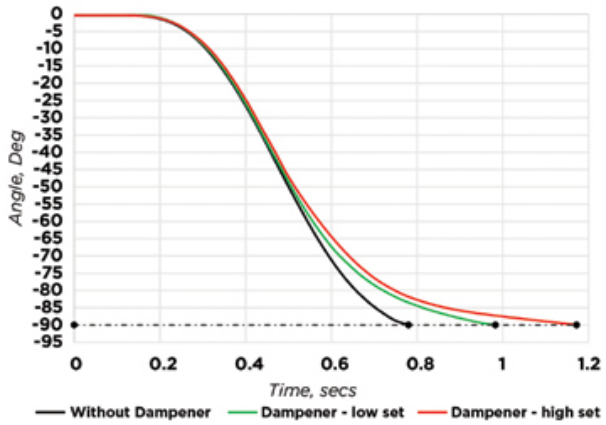
- **API 6D Platform**: Proven isolation valve design widely accepted in safety and pipeline services.
- **Soft- or Metal-Seated Options**: Configurable based on leakage class, media, and HIPPS service severity.
- **High Differential Pressure Capability**: Trunnion support and seat design ensure stable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

HIGH-SPEED PNEUMATIC ACTUATION

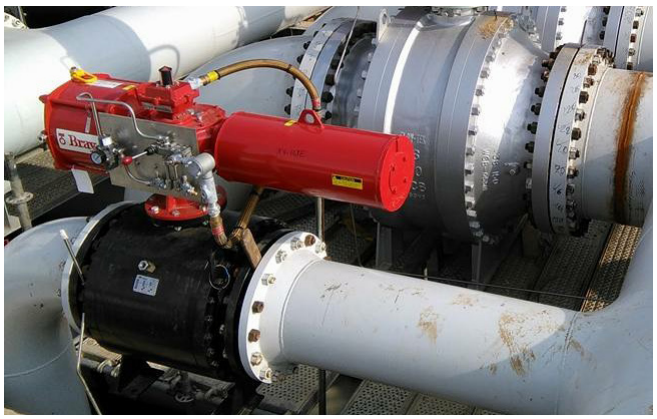
- **Fail-Safe Spring-Return or Double-Acting Designs**
- **High-Capacity Air Flow & Exhaust**
- **Oversized Torque Margins**
- **Severe Service & Low-Temperature Options**
- **Integrated Dampener for Improved Repeatability**

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.