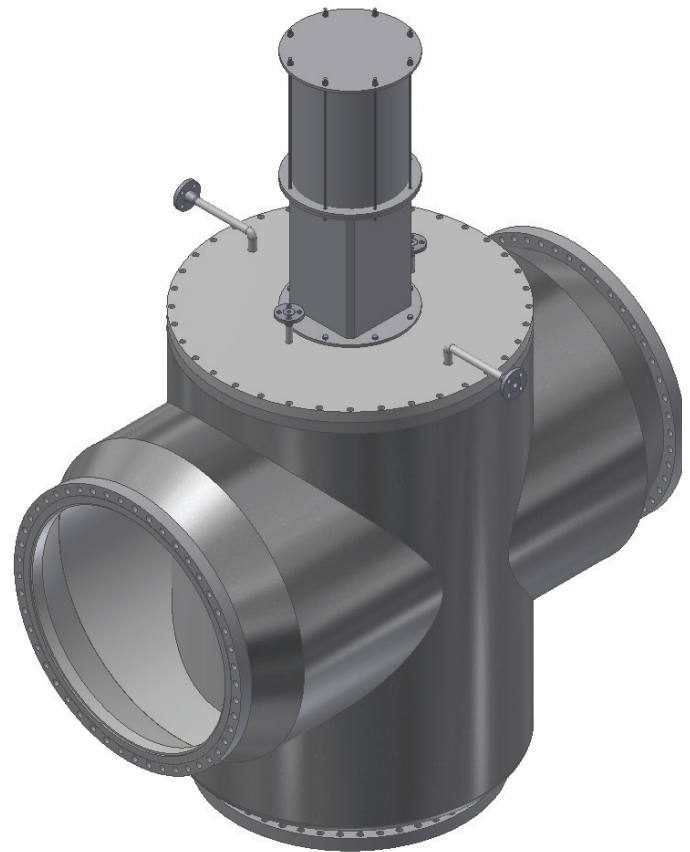


FRISCH ENGINEERED PRODUCTS INC.



ANGLE VALVES

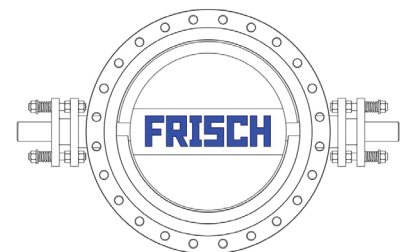


"Known by the companies we keep"

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Website: www.frischvalves.com



CORPORATE PROFILE

Since the 1960s Frisch's name has been synonymous with **great quality, innovative design, & timely customer service**. Frisch's new ownership created a **cohesive management team** in 1998 comprised of leaders from the valve industry in management, marketing, engineering, and manufacturing.

Our **Team** merged the best of innovative ideas with a wealth of valve industry experience to create a **powerful impetus** moving our company forward.

The **wide range of products** we offer at Frisch speak for themselves. Custom engineered to meet each client's individual needs, Frisch stays on the leading edge to ensure every client is **completely satisfied** with the product they receive.

THE STRENGTHS OF OUR COMPANY:

- Custom Design and Fabrication to meet every clients individual requirements
- Focus is on Critical or Severe Service Applications
- Flexible Manufacturing Ability
- Diverse Metallurgical Expertise
- Great Products
- The latest Material Requirement Planning (MRP)
- Stringently enforced quality control program in conformance with the Latest ISO Requirements

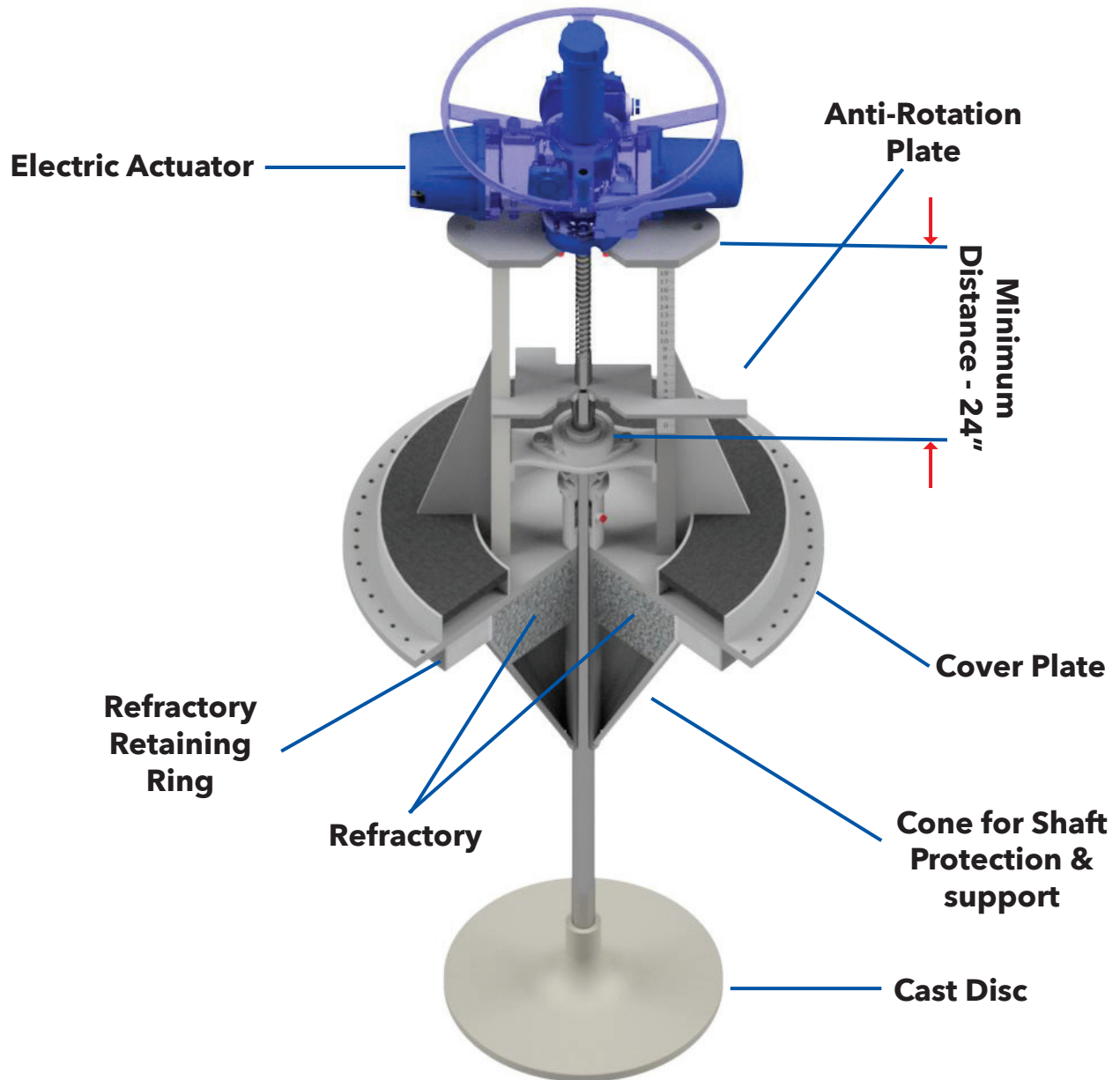
1. JUG VALVE

- Sizes - 12" to 96"
- "For Control of high temperature (up to 2250F) flue gas
- Designed to to be used in systems with pressures up to 50 PSIG
- Refractory or Metal Seat Designs
- Refractory Lined if required
- Seat configurations to achieve minimal leakage
- Motor or Manual operation
- Vertical or Horizontal Orientation

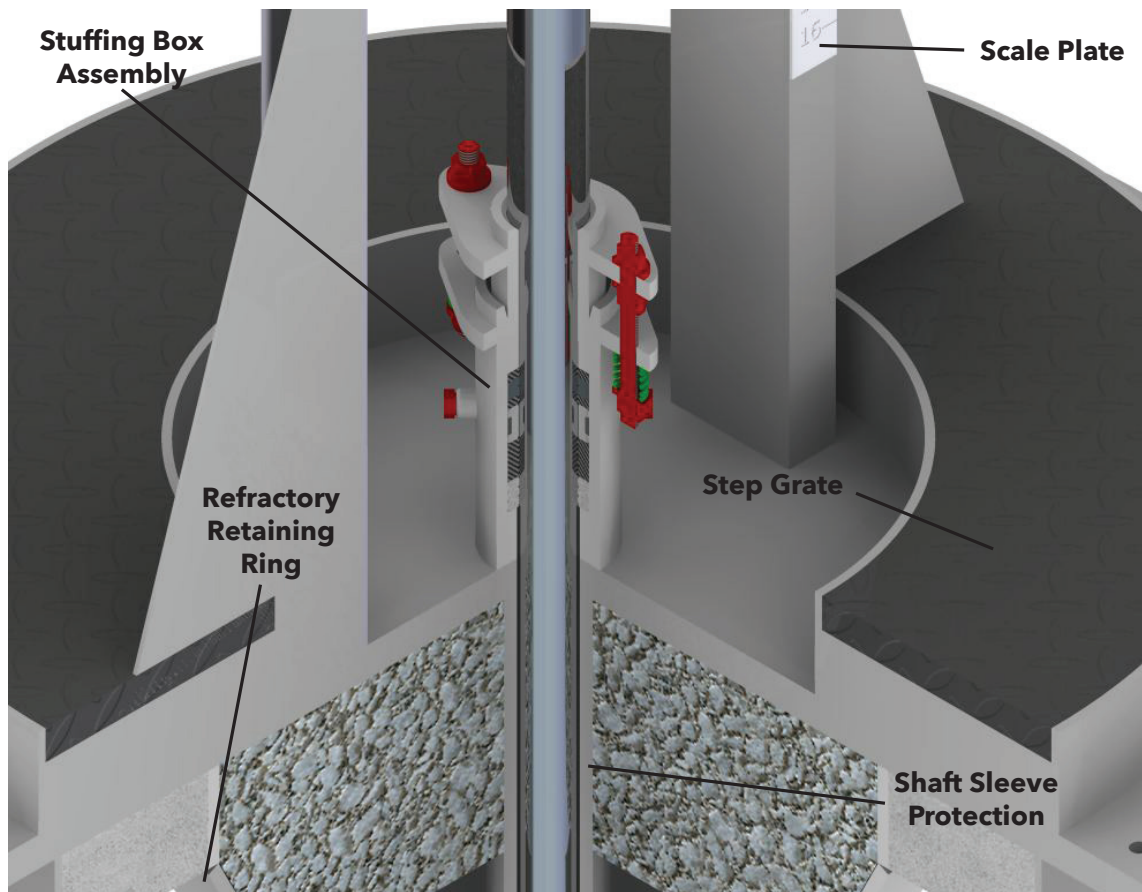
Features & Benefits

1. Longer distance between bottom of actuator mounting plate & top of gland follower. In the event of failure of packing (when not replaced as suggested) allowing blow by of the internal gas stream, the actuator is kept far enough away from the escaping gases to minimize the opportunity of hot gases affecting the operability of the actuator.
2. Proprietary Stem Packing. Specially designed & developed for high temperature service requirements. Lasts longer than most stem packing available on the market today.
3. Refractory lined Support Cone with extended shaft sleeve. The support cone & extended sleeve keep the shaft cooler and stable from passing hot gas streams. A cooler shaft increases service life of both the shaft & the shaft packing. It also assures a guided opening and closing cycle assuring smooth long term operation of the valve & actuator combination.
4. Cast disc designed with FEA for improved less restrictive geometry and reduction of stress points.
5. Alloy disc construction. Lighter than a refractory lined disc so less likely to over stress shaft. Special alloys (optional) if required to substantially increase service life of disc.
6. Live loaded & purged Zero Leak Packing Gland Eliminates fugitive emissions from packing area.
7. Refractory lining of top cover plate. Keeps top cover plate cool enough to allow operations and maintenance personnel access to the actuator controls, & packing glands.
8. Polished shaft. Assists in maintaining long term stem seal
9. Step Grate (optional). Allows more comfortable & safer access to valve Topworks including the actuator controls

1. JUG VALVE



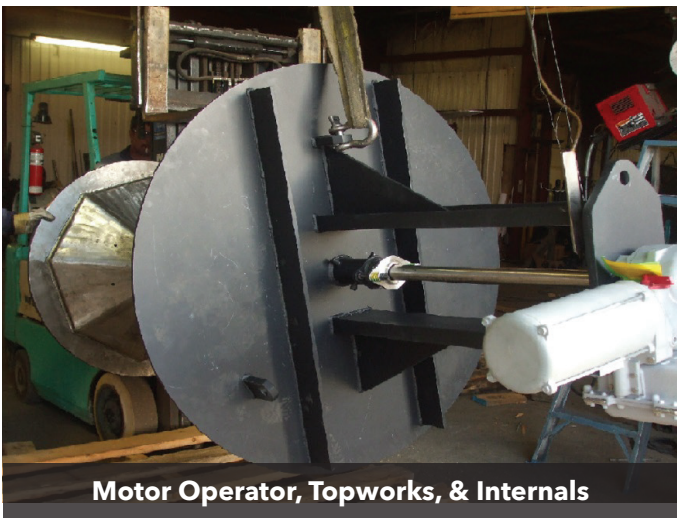
1. JUG VALVE



1. JUG VALVE



Motor Operated Jug Control Valve 2100F 7 Psig



ANGLE VALVES

2. HOT GAS MIXING VALVES

- sizes - 3" to 96"
- For control of high temperature flue gas
- Pressures to 150 PSIG
- Refractory or Metal Seat Designs
- Seat configurations to achieve minimal leakage
- Pneumatic, Hydraulic, Motor or Manual operation
- Vertical or Horizontal Orientation
- For Use in Temperatures to 2200F

ANGLE VALVES

APPLICATIONS/SERVICE



3. GAS SWITCHING VALVES

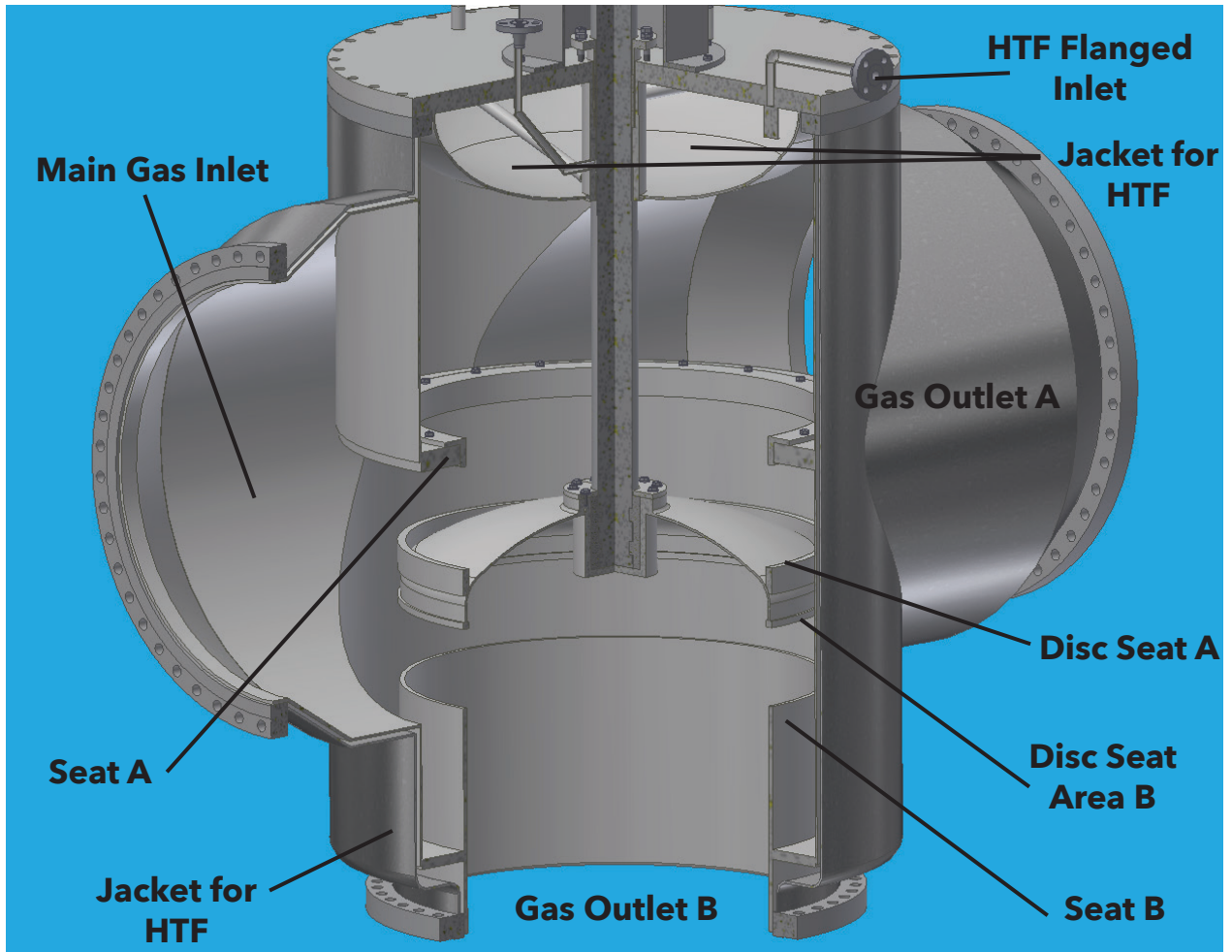
- sizes - 3" to 96"
- Specially designed for process gas switching valves that must perform in very demanding sulfur vapor services in CBA®, SCOT® & CLAUS desulphurization plants
- Pressures to 150 PSIG
- Jacketed Body, Disc, & Seat as required
- Metal Seat Designs
- Refractory Lined if required
- Seat configurations to achieve Class 6 Shutoff
- Pneumatic, hydraulic, motor or manual operation
- Vertical or horizontal orientation
- For use in temperatures to 1700F

Features & Benefits

1. Guide Bushing & Sleeve. Fully guided opening and closing
2. Disc with double seating surfaces. Disc is machined to match both seat perfectly minimizing side loading of shaft and ensures disc mates with the seat at the appropriate angle for bubble tight metal to metal seating
3. Rounded seat profile. Allows single point metal to metal contact with disc for long term tight metal seat.
4. Special seating geometry. Allows shearing of any Sulphur build up on seats or disc sealing areas.
5. Customized design & fabrication. Meets the exact requirements of a wide range of service conditions & piping configurations.
6. Live loaded jacketing Packing Gland. Allows for zero leakage Eliminating fugitive emissions from packing area
7. Flanged heat transfer fluid connections. Ease of maintenance & assembly.

ANGLE VALVES

3. SWITCHING VALVES IN GAS PLANTS



APPLICATIONS/SERVICE

Switching Valves For Gas Plant



INDUSTRIES SERVED

1. SULPHURIC ACID PLANTS

- Bypass Air to SO₂ Converter
- Waste Heat Isolation
- Main Blower Discharge Isolation
- Pre-Heat Duct Isolation for Start-up
- Pass 1, 2, 3, & 4 Converter Heat Up Duct
- Cold HEX to Process Air Preheater
- CIP outlet to CIP Inlet

2. SOUR GAS PROCESSING

- Bypass Air to SO₂ Converter
- Waste Heat Isolation
- Sulphreen Train Switching
- Reaction Furnace Hot Gas Bypass Temperature Control
- Acid Gas Isolation Valves

3. OIL REFINERIES

- SRU
- Waste Heat Boiler Isolation
- Reaction Furnace Hot Gas Bypass Temperature Control
- Turbo Expander Inlet Control & Bypass Isolation

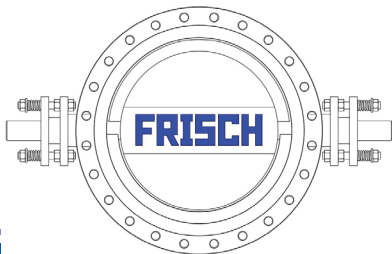
FRISCH'S CORPORATE COMMITMENTS

WE SUSTAIN AND RETAIN employee excellence and commitment through ownership, education, and training.

WE WILL NEVER compromise quality.

WE WILL ALWAYS uphold our commitment to low cost manufacturing.

ENSURE ON-TIME DELIVERY of valves our customers can depend on.



CORPORATE OFFICE
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CORPORATE PROFILE

Frisch Engineered Products' Corporate Mission is to provide every customer with **reliable valves** for the **best price without compromising quality**. Our **corporate commitment** is to maintain a worldwide reputation of **distinction in the fabricated valve market**. Our **seasoned personnel, insightful and innovative management systems**, and a **tightly controlled quality assurance** program ensure timely delivery of the technologically advanced valves our customers can depend on.

Frisch's team is comprised of leaders in engineering, marketing, finance, and manufacturing. Since 1988 our products for **severe service applications** have been meeting the **most rigorous requirements** of world leaders in industry and government.

Frisch manufactures a complete range of valves for low pressure, high temperature, erosive and corrosive services. We also provide comprehensive packages for actuation and control. Each package is custom engineered to specific customer requirements. We are capable of supplying valves for services to **50 psi and 3000°F**.

The Frisch Team has serviced the following industries:

Coal Gasification
Carbon Black
Metals Refining and Smelting
Oil Refining
Petro Chemical
Power Generation
Pulp and Paper
Steel Mills
Sulphuric Acid Plants
Waste Incineration and Management
Waste Water Treatment

The plants above use our products in the following areas:

- Bag Houses
- Catalytic Cracking Units
- CO Boilers
- Control or Isolation of Flue Gases
- Control and Isolation of Process Gases
- Dust Collection Systems
- Fume Collection & Incineration
- Reactor Inlet and Outlet
- Sulphur Burning Furnaces
- Sulphur Recovery
- Turbo Expander Isolation and Control
- Waste Gas Recovery Systems
- Waste Heat Boilers

Contact Frisch for assistance to solve **all your severe service** fluid control and shutoff problems.

PRODUCTS

Frisch valves and dampers include a wide variety of types and sizes of **butterfly, angle, diverter, guillotine, gate, and refractory lined** designs. Valve seats and seals of creative design configurations progress from swing-through for **precise low pressure flow** control to machined hard faced seats for **very tight shutoff** to FCI 70.2 Class V.

Sizes: 2' to 144" for the products listed to the right.

Pressure Classes to ANSI 1500

Services temperatures from -400°F to 3000°F.

We manufacture the following products:

Butterfly Valves

Rubber Seated, Metal Seated, Swing Through

Slide Gate Valves

Parallel, Wedge Type, Refractory Lined

Multi Blade Dampers

Parallel or Opposed Blade, Refractory Lined

Angle Valves

Metal Seated, Refractory Lined

Diverter & Mixing Valves

Y or T Configurations, 2, 3, or 4 Way

FRISCH FIGURE NUMBER SYSTEM

VALVE TYPE
DESIGN PRESSURE
BODY END STYLE
BODY MATERIAL
TRIM AREA

Eg.: 20 : 0010 : - RF : -AA : -AE

Butterfly Valve, designed for 10 PSI @ 800°F, with Raised Face Flanged Ends, Body is Carbon Steel, and Trim is 304 Stainless Steel

FRISCH VALVE TYPE

- 20 - Concentric Butterfly Valve or Damper
- 21 - Butterfly - O-Ring Single Offset
- 22 - Butterfly - Double Offset
- 23 - Triple Offset Valve
- 24 - Unassigned
- 25 - Refractory Lined Butterfly
- 30 - Plug/Jug Valve
- 31 - Poppet Valve
- 35 - Refractory Lined jug Valve
- 40 - Unassigned
- 50 - Multi Blade Louver
- 55 - Multi Blade Refractory Lined Louver
- 60 - Flex Wedge Gate Valve
- 62 - Double Block & Bleed Gate Valve
- 65 - Refractory Lined Gate Valve
- 70 - Check (discontinued)
- 80 - Diverter - T
- 85 - Diverter - T - Refractory
- 90 - Diverter - Y
- 95 - Diverter - Y - Refractory

DESIGN PRESSURE

0001- 1- 9999 Psig

BODY END CONNECTION/ BODY STYLE

BW - Butt Weld Ends
FF - Flat Face Flange
RF - Raised Face Flange
RT - Ring Type Joint Flange
LG - Lugged Body
WF - Wafer Flange
ZZ - Other - Specify

BODY MATERIAL

AA - A36/44W Carbon Steel
AB - A516GR70/A216WCB/A105
AC - A387GR11/A217WC6/A182F11
AD - A387GR22/A217WC9/A182F22
AE - A240T304/A351CF8/A182F304
AF - A240T304H/A351CF8/A182F304H
AG - A240T316/A351CF8M/A182F316
AH - A240T347/A351CF8C/A182F347
AI - Inconel 625/A494CW6MC/B564NO6625
ZZ - Other - Specify

TRIM MATERIAL

Same Code As Body

www.frischvalves.com