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PROVIDE CUSTOMERS WITH SAFE AND
RELIABLE FLUID CONTROL SOLUTIONS

FLS GATE VALVES

Manual Gate Valve

Hydraulic Safety Valve

Pneumatic Safety Valve

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FANGZHENG VALVE GROUP SHANGHAI CO., LTD



>>> ABOUT US

Fangzheng Valve Group Shanghai Co., Ltd. is a manufacturer focus on Oil & Gas drilling and production equipments, engaging in researching & developing, manufacturing, sales and services. Founded in 2003, Fangzheng Valve Group Shanghai Co., Ltd covers 24000m² in Jinshan Ind. Zone, Shanghai, P.R.China.

Products of Fangzheng Valve Group Shanghai Co., Ltd: Oil (Gas) Wellhead and Christmas Tree, Choke and Kill manifolds, Drilling Spools, Hydraulic/Ball Screw Operated Slab Gate Valves, Ball Valves, Choke Valves, Check Valves, Blowout Preventers(BOPs), Casing Heads, Tubing Heads, Casing Spools, Tubing Spools, Flanges, etc. The working pressure of Fangzheng Valve Group Shanghai Co., Ltd products ranges from 2000 psi to 20000 psi, Specification Level range from PSL1 to PSL4, Performance Requirement Level ranges from PR1 to PR2, with functional characteristics such as low open and close torque value, small fluid impact, low noise, good sealing performance, anti-fire and anti-static designs.

Fangzheng Valve Group Shanghai Co., Ltd business philosophy: To be an Integrity-Based, Quality-Focused, Customer-First enterprise. The quality marketing awareness has continuously improved the management team of Fangzheng Valve Group Shanghai Co., Ltd. Equipped with advanced production and inspecting equipments, Fangzheng Valve Group Shanghai Co., Ltd has won an excellent reputation in the petroleum industry.

Certificates of Fangzheng Valve Group Shanghai Co., Ltd: API 6A, API 16C, API Q1, ISO/TS29001, ISO9001, ISO14001, OHSAS18001, TS Certificate (Manufacture License of Special Equipment), and PR2 Certificate for 3-10M, 4-15M and 5-10M gate valves, etc.

Over the years, with strong company culture, high effective management system, Fangzheng Valve Group Shanghai Co., Ltd continuously explores its potential for the complex and changeable market environment. Domestically, Fangzheng Valve Group Shanghai Co., Ltd has been titled with “High and New Technology Enterprise”, and “Patent Pilot Enterprise”. Fangzheng Valve Group Shanghai Co., Ltd also possesses 11 national patents for combined-gate-type high temperature gate valve, high pressure and big size globe valve, high temperature metal sealing expanding gate valve, ball screw operated gate valve, etc. Fangzheng Valve Group Shanghai Co., Ltd has been an innovative and independent brand in the petroleum industry. Fangzheng Valve Group Shanghai Co., Ltd products have been sold to many countries and regions, such as North America, Europe, Middle-East and Southeast Asia, and the annual exports ranks the forefront in the petroleum industry in Shanghai. With its best products and service, Fangzheng Valve Group Shanghai Co., Ltd aims to be first class petroleum brand domestically and globally.

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FZV FLS GATE VALVES

Gate Valve Description:

The Gate Valve is one of the most common types of isolation valves. By rotating a handwheel or operating an actuator, the stem is turned, causing it to rise or lower. This vertical motion drives the gate attached to the stem. When the gate is fully raised, the valve is open, offering a straight-through flow path with minimal pressure drop. When the gate is fully lowered, its sealing surfaces contact the seat rings, completely shutting off the flow.

NOTE: The gate valves are mainly used to fully open or fully close the fluid in the pipeline, and they are not designed for throttling or regulating the flow rate.

The FLS gate valves provide proven FZV features and low maintenance for drilling and production applications. The Technology Department of FZV offers the FLS gate valves with the security and reliability of metal-to-metal sealing in a wide range of working pressures.

The FLS valves feature a simple and reliable gate-and-seat assembly which minimizes inventory requirements and eases maintenance while still providing true metal-to-metal sealing.

These valves also offer: the durability and integrity of a forged steel body and bonnet; the performance characteristics of the basic proven FZV design; low maintenance costs; and, ease of service.

FZV FLS gate valves are available in all popular bore sizes. The FLS gate valve is available in 5,000 and 15,000 psi pressure ratings.

These models of gate valves are offered in all API 6A temperature and materials classes and in product specification levels (PSL) 1 through 3.

FLS Valve Features:

■ Full bore Design

Full bore design, eliminating pressure drop and whirlpool, abating scour of solid particles in liquid.

■ Metal-to-Metal Sealing

Unique seal form decreases the open/close torque dramatically. Sealing at gate-to-seat and seat-to-body is metal-to-metal.

■ Forged Steel Construction

The body and bonnet are constructed of forged steel for maximum reliability and safety. Gate surface is high-velocity oxygen fuel with hard alloy coating and the seat rings are made of hard alloy. This provides good wear resistance and corrosion resistance.

■ Improved Seat Seal Design

The FLS design includes two spring-loaded lip-seals on each seat at the seat-to-body interface. This double-seal design provides maximum protection against intrusion of particle contaminants into the valve cavity. This prevents sand particles from affecting the metal-to-metal seals between the body, seats and gate, and also prevents body erosion in drilling mud applications.

■ Back Seating Stem (Optional)

Stem has inverted seal structure, making it easy to replace the stem seal packing under pressure.

■ Grease Injection Fitting

One side of the bonnet has a sealant injection valve to supplement sealing grease to improve the sealing and lubrication performance of the seat and gate.

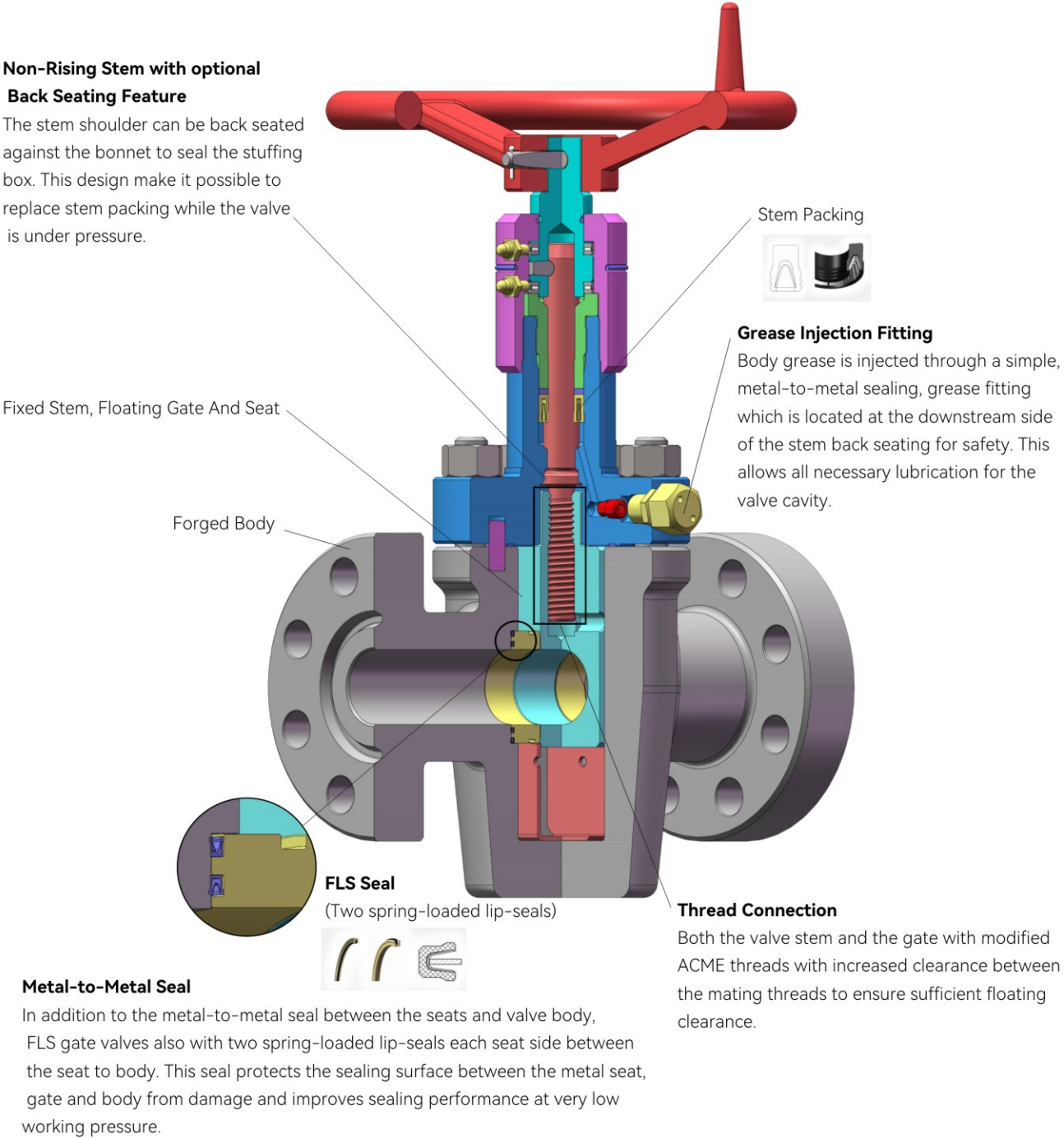
■ Standard Actuators

FLS gate valves can be converted to automatic safety valves with the addition of a hydraulic or pneumatic actuator. These actuators are available with a full range of accessories. For drilling and manifold service, FLS gate valves are available with a double-acting hydraulic actuator on a balance-stem valve configuration.

All specs of FLS gate valves can be fitted with hydraulic (pneumatic) actuators as per user requirement.

Non-Rising Stem with optional Back Seating Feature

The stem shoulder can be back seated against the bonnet to seal the stuffing box. This design make it possible to replace stem packing while the valve is under pressure.



Material Selection for Gate Valves

Material Selection

The design and selection of valve component materials shall ensure the valve's functions and characteristics such as pressure resistance, temperature resistance, corrosion resistance, and reliable sealing. Meanwhile, the selection must be comprehensively determined by combining factors including medium properties, operating parameters (pressure and temperature), service life, and economic costs.

Once the materials are selected, the materials or blanks shall undergo machining, heat treatment, and other processing procedures to achieve a complete structure, optimize performance, and adapt to operating conditions.

Product Performance Test

Product performance testing complies with API 6A specifications. Major components and materials for FLS gate valves are subjected to rigorous performance verification testing before these are supplied in a valve.

Fully automated computer-controlled test equipment has been constructed to perform performance verification testing of gate valves and gate valve actuators in accordance with the recommendations of API Specification 6A.

Material Class and Recommendations

Standard Valve Trim Materials-FLS					
API 6A Material Class	Body & Bonnet	Gates & Seats	Stem	Stem Packing	Bonnet Gasket Seal
AA General Service	AISI 4130	AISI4130, hard-faced	AISI 4130	Lip Seal	AISI 1010
BB General Service	AISI 4130	AISI 410, hard-faced	AISI 410	Lip Seal	316SS
CC General Service	AISI 410SS	AISI 410, hard-faced	UNS S17400	Lip Seal	316SS
DD Sour Service ^a	AISI 4130	AISI 4130, hard-faced	AISI 4130	Lip Seal	AISI 1010
EE Sour Service ^a	AISI 4130	AISI 410, hard-faced	AISI 410	Lip Seal	316SS
FF Sour Service ^a	AISI 410SS	AISI 410, hard-faced	UNS S17400	Lip Seal	316SS
HH High H ₂ S, Sour Service ^a	AISI 4130 cladding with CRA ^{ab} alloy 625	CRA ^{ab} UNS N06625, hard-faced	CRA ^{ab} N07718	Lip Seal	CRA ^{ab} UNS N08825

FOOTNOTES

a. In accordance with NACE MR0175/ISO 15156 .

b. CRA required on retained fluid-wetted surface only; CRA cladding of low-alloy or stainless steel is permitted.

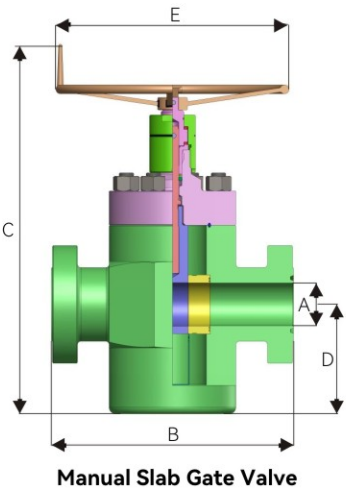
Matrix table for Dimensional Data

Dimensional Data:

A= Bore Diameter **D**= Center Height
B= Face-to-Face Length **E**= Handwheel Outer Diameter
C= Overall Valve Height

Note: All dimensions are estimates and finished dimensions may vary.

Note: This is only a brief description of the working pressure and dimensions for a type of manual gate valve for reference. The specific dimensions shall be determined according to customer requirements and actual design structures (Designed and manufactured in compliance with API 6A standards).



Manual Slab Gate Valve

Dimensional Data for the Corresponding Specification

Flange spec.	Working pressure	A(mm/in)	B(mm/in)	C(mm/in)	D(mm/in)	E(mm/in)
2-1/16"	5,000psi	52.3 / 2.06"	371/14.62"	533.4/21.0"	142.8/5.62"	Φ355.6/14.0"
2-9/16"		65.0/2.56"	422/16.62"	554.0/21.81"	165.1/6.5"	Φ355.6/14.0"
3-1/8"		79.3/3.12"	473/18.62"	576.3/22.69"	187.5/7.38"	Φ457.2/18.0"
4-1/16"		103.1/4.06"	549/21.62"	617.5 /24.31"	231.7/9.12"	Φ457.2/18.0"
7-1/16"		179.3/7.06"	813/32.0"	726.9/28.62"	323.9/12.75"	Φ609.6/24.0"
1-13/16"	10,000psi	46.0/1.81"	464/18.25"	533.4/21"	146.1/5.75"	Φ355.6/14.0"
2-1/16"		52.3/2.06"	521/20.5"	533.4/21"	149.4/5.88"	Φ355.6/14.0"
2-9/16"		65.0/2.56"	565/22.25"	550.9/21.69"	173.0/6.81"	Φ355.6/14.0"
3-1/16"		77.7/3.06"	619/24.38"	577.9/22.75"	204.7/8.06"	Φ457.2/18"
4-1/16"		103.1/4.06"	670/26.38"	654.0/25.75"	255.5/10.06"	Φ609.6/24"
5-1/8"	15,000psi	130.1/5.12"	737/29.01"	844.5/33.25"	331.8/13.06"	Φ711.2/28.0"
1-13/16"		46.0/1.81"	457/18.0"	428/16.85"	181/7.13"	Φ400/15.75"
2-1/16"		52.3/2.06"	483/ 19.0"	428/16.85"	182/7.17"	Φ400/15.75"
2-9/16"		65.0/2.56"	533/21.0"	538/21.18"	198/7.80"	Φ470/18.50"
3-1/16"		77.7/3.06"	598/23.56"	550/21.65"	265/10.43"	Φ550/21.65"
4-1/16"		103.1/4.06"	737/29.0"	638/25.12"	291/14.46"	Φ660/25.98"

Material Selection and Working Pressure

Selection Matrix table for Seals of API 6A Valves

SLAB GATE VALVE- FLS				
TRIM PARTS SEALING MECHANISM	STEM PACKING	SERVICE TEMPERATURE CLASS	SERVICE MATERIAL CLASS	REMARK
GATE/SEAT: METAL SEAL	RPTFE+ELGILOY	K, L, N, P, T, U, V	AA/BB/CC/DD/EE/FF/HH	
SEAT/BODY: PEEK+ELGILOY				
GATE/SEAT: METAL SEAL	RPTFE+ELGILOY +GR AFOIL	X, Y	AA/BB/CC/DD/EE/FF/HH	Geothermal
SEAT/BODY: PEEK+ELGILOY				

NOTE: Provide a full range of options according to customer requirements.

Opening Torque for Manual Gate Valves

Nominal Size mm(Inch)	Without Pressure Opening Torque (N.M)	Rated Working Pressure MPa(psi)				
		14(2000)	21(3000)	35(5000)	70(10000)	105(15000)
		Opening Torque (N.M)				
46(1-13/16)	3	--	--	--	125	150
52(2-1/16)	5	50	75	100	150	175
65(2-9/16)	5	75	100	125	175	200
78(3-1/16)	7	--	--	--	200	225
80(3-1/8)	7	100	125	150	--	--
103(4-1/16)	9	150	150	175	250	275
130(5-1/8)	12	--	175	--	275	--
180(7-1/16)	14	175	200	225	300	375
228(9)	18	-	-	350	-	-

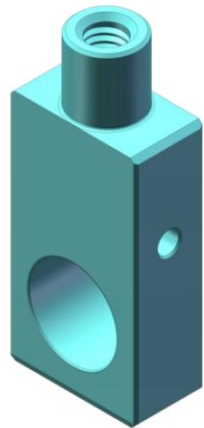
SLAB GATES AND OPERATION STATUS

Slab Gates

The majority of our gate valve designs adopt a solid and single-piece gate plate. The use of a slab-style gate simplifies the design, resulting in a valve that is rugged, yet easy to assemble and maintain.

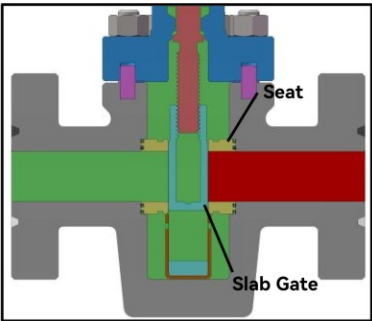
Features and Benefits include:

- Adopts an integral flat plate design for a simplified and reliable structure.
- Features metal-to-metal sealing between the gate and valve seat, achieving bi-directional sealing with stable performance.
- Undergoes hardfacing with cemented carbide and other strengthening treatments on the surface for excellent wear and corrosion resistance.
- Facilitates easy maintenance and ensures a long service life.
- Boasts wide adaptability and is compatible with different pressure ratings and temperature ranges.



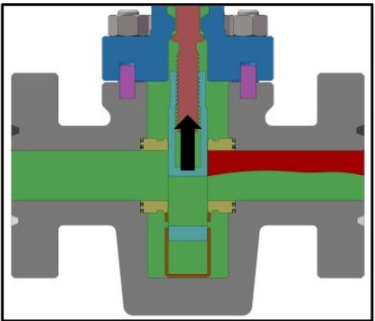
Slab Gate

Operation Status of Slab Gate Valves



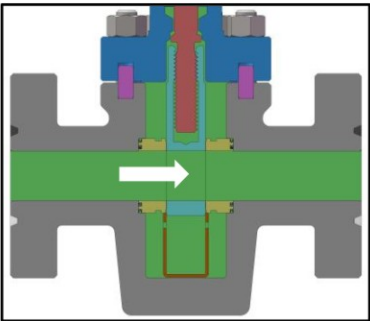
Sealed Closed

In the fully closed position, the valve seat and gate achieve tight metal-to-metal sealing, completely blocking the medium flow.



Mid-Travel

During travel towards opening, the valve stem drives the gate to lift perpendicular to the flow passage, and the gate disengages from the valve seat sealing face.



Fully Open

When the bore in the seat is aligned with the conduit bore, the gate rises to the limit position, the valve seat passage is fully aligned with the gate flow channel, allowing the medium to pass through unobstructed at full flow, and the flow resistance is minimized.

HYDRAULIC SAFETY VALVE BASED ON FZV FLS GATE VALVES

FLS gate valves can be converted to automatic safety valves with the addition of a hydraulic or pneumatic actuator or piston actuator. These actuators are available with a full range of accessories.

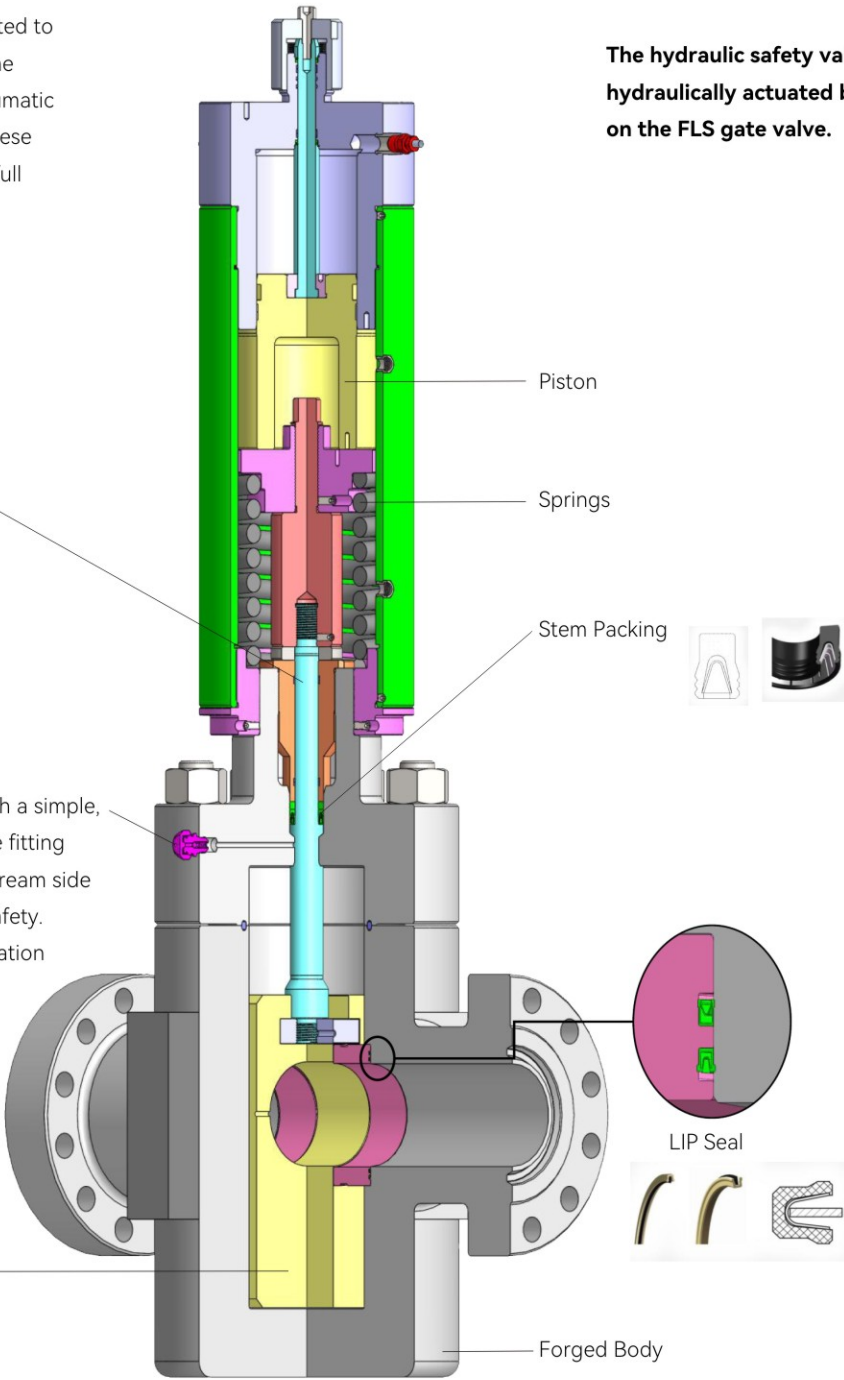
The hydraulic safety valve is hydraulically actuated based on the FLS gate valve.

The valve stem with surface harden treatment by QPQ.

Grease Injection Fitting

Body grease is injected through a simple, metal-to-metal sealing, grease fitting which is located at the downstream side of the stem back seating for safety. This allows all necessary lubrication for the valve cavity.

Slab Gate



Piston

Springs

Stem Packing

LIP Seal

Forged Body

Description:

The hydraulic safety valve is a type of valve that relies on pressure changes of liquids (such as oil, water, etc.) to automatically open or close, thereby ensuring that the system pressure does not exceed the safety threshold. Hydraulic safety valve is commonly used in industrial fields such as petroleum, chemical engineering, and hydraulic systems.

Under normal conditions, the preload force of the spring keeps the valve disc closed and sealed. When the system pressure exceeds the set value, the pressure sensor triggers the controller, and the hydraulic pump or accumulator supplies oil to the actuator, which drives the valve disc to overcome the spring force and open for pressure relief. After the pressure returns to normal, the hydraulic system acts in the reverse direction, and the spring pushes the valve disc to reset and close.

Design Advantages

Safety Shut-off Design

Upon loss of hydraulic pressure, the actuator will close the valve with available spring force without wellbore pressure.

Corrosion Resistant Materials

The hydraulic safety valves are manufactured to NACE MR-01-75, in addition that all non-stainless components are coated to maximize corrosion resistance.

Large Porting Eases Maintenance

Pressure inlet and relief flow passages are 1/2"NPT. These larger ports are durable and help eliminate debris buildup.

Permanent Drift Setting

Stainless steel spacers are used to provide permanent drift adjustment. Removal of the actuator does not affect the adjustment.

Ease of Maintenance

The actuator utilizes seals and backup rings on the piston and rising stem. Seals are readily available worldwide and are easily replaced with common tools.

Breathing Plug Ventilation

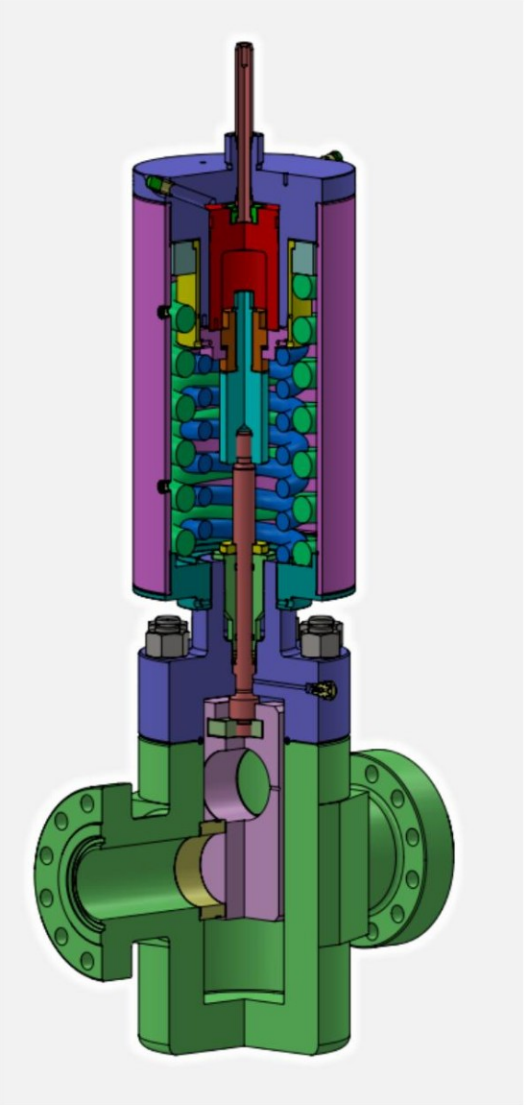
Breathing plug ventilation ensures pressure balance between the inside and outside of the support.

Quick Closing Time

The valve closing time can be as quick as 2 seconds for SDV or HIPPS application.

Certification

SIL2/Fire Test certificates/ISO 15848 certificates are available.



Hydraulic Safety Valve with Wire Cutting Function

A dual compression spring design produces the necessary closing force to shear wire line, without assist of well fluid pressure.
The actuator's versatile design provides fast, trouble-free interchangeability of major components and easy field maintenance.

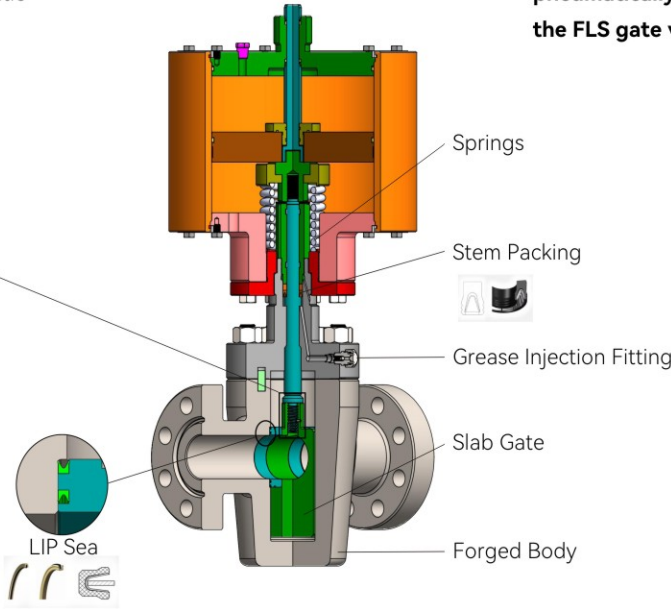
PNEUMATIC SAFETY VALVE BASED ON FZV FLS GATE VALVES

FLS gate valves can be converted to automatic safety valves with the addition of a hydraulic or pneumatic actuator or piston actuator. These actuators are available with a full range of accessories.

The pneumatic gate valve is pneumatically actuated on the FLS gate valve.

Thread Connection

Both the valve stem and the gate with modified ACME threads with increased clearance between the mating threads to ensure sufficient floating clearance.



Integrating the structural advantages of FLS Gate Valves with the efficiency of pneumatic actuation, the core features are as follows:

Efficient Pneumatic Actuation

Equipped with a pneumatic actuator, supporting dual modes of remote automatic control and on-site manual operation. Rapidly responds to shut-off/on requirements, suitable for oil & gas wellheads, manifolds and other working conditions, reducing labor costs;

Stable & Reliable Structure

Inherits the integral slab gate design of the FLS series, without complex transmission components. Combined with metal-to-metal sealing pairs, it resists high-pressure impact (API 2000~10000 psi) and pipeline vibration, significantly reducing jamming risks;

Strong Resistance to Harsh Environments

The gate surface is hard faced with cemented carbide (Tungsten Carbide), and the valve body cavity is treated with an anti-corrosion coating. It can withstand erosion and corrosion from high-salinity geothermal fluids and sand-containing oil & gas media, adapting to a wide temperature range of -29°C~121°C;

Superior Sealing Performance

Bi-directional sealing design, with pneumatic pressure automatically compensating for sealing surface wear. The leakage rate meets the API 6A zero-leakage standard, ensuring the safety of medium isolation under high-temperature and high-pressure conditions;

Convenient & Efficient Maintenance

Modular design of the pneumatic actuator for easy disassembly and assembly. The gate and valve seat can be ground and repaired independently without replacing the entire valve, shortening downtime and reducing operation and maintenance costs;

Wide Application Adaptability

Oil and gas production trees, long-distance pipelines and other scenarios.