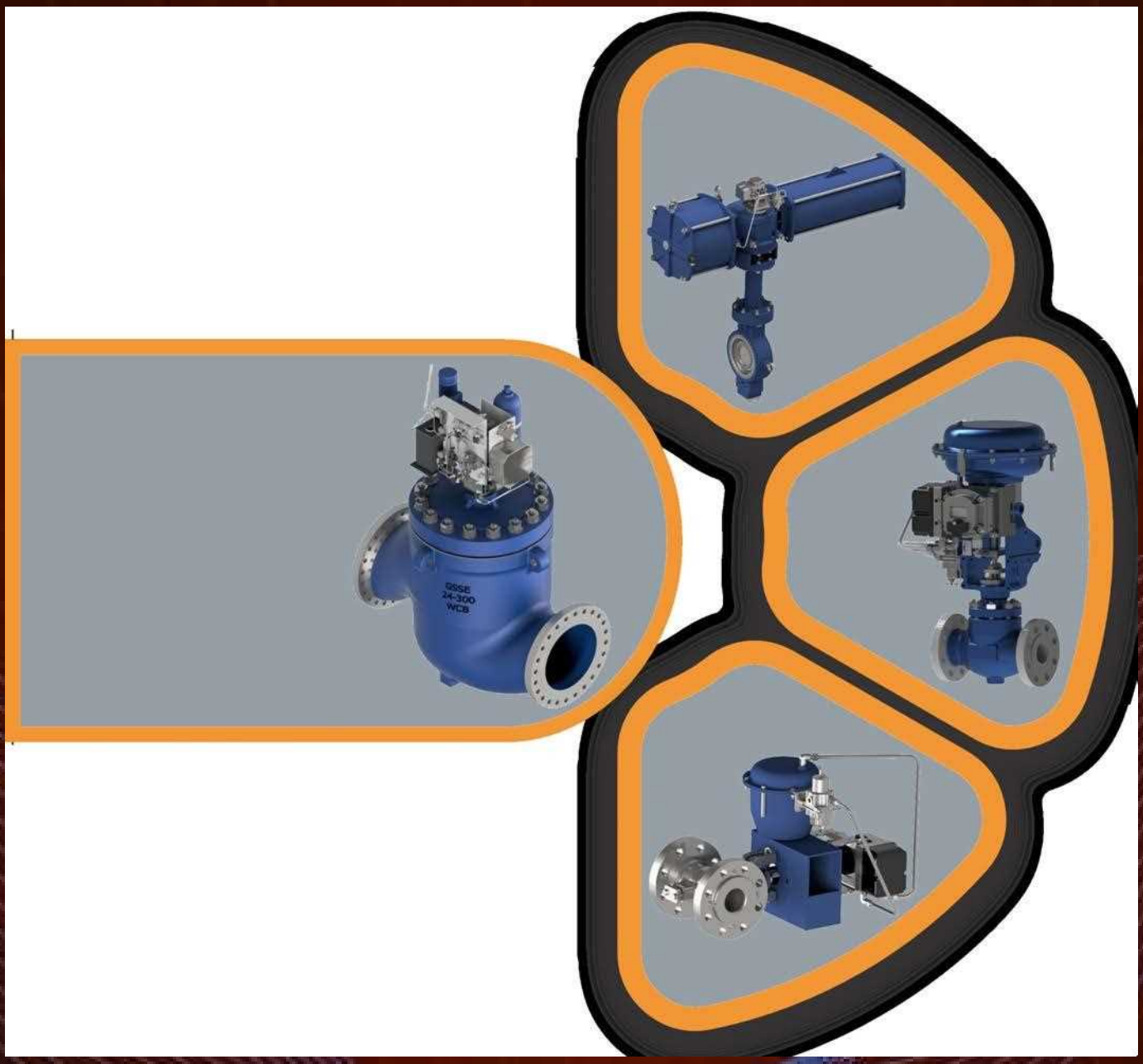
GSSE

CONTROL VALVE GENERAL CATALOGUE

MADE IN IRAN



TOTAL SOLUTION FOR YOUR
PROCESS REQUIREMENTS

WWW.GSSE-CO.COM

PUB NO.:2024-CV-GEN-REV18

GSSE is a kno
sign and
Power p
engineering team design and simul
international standards API, ASME,
and IGS. We use latest software for
and manufacturing of our product
of valve including:

- Control Valves (Globe, Ball, Bu
- Pressure Safety Valves (Conven
- Pressure Regulator Valve (Back
  ducing Regulator Valve & Tank
- On-Off Valve (Ball valves, Orbit

ucts have been in service in oil an
plants and other industries for ma
GSSE fully modernized CNC machi
ment enable us to offer best servi
CAD-CAM Online network from ou
ing shop help us to make our job i

wledge enterprise company active in de-
manufacturing of valves for Oil and Gas,
lant and industrial plants. Our skilled
ate all of our products while considering
ANSI, MSS, NACE, ISO, ISA, BS, ATEX, IPS
sizing and selection, design, simulation
ts. GSSE is manufacturing various types

tterfly)
tional , Bellows, Pilot Operated)
Pressure Regulator Valve, Pressure Re
Blanketing Regulator Valve)
t Ball Valves, ESDV, HIPPS) Our prod-
d gas refineries, petrochemicals, power
ny years.
ning facilities assembly and test equip-
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ur engineering office to the manufactur-
n the shortest time.

Contents **Page**

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Quality

GSSE is totally committed to Quality and a smooth integration of all departments with the Quality Assurance and Quality Procedures.

GSSE is qualified to ISO 9001:2015, HSE-MS, ISO / TS 29001:2010 International Standards.

This guarantees that all our products are designed, manufactured and delivered in accordance with the most strict customer requirements. By this we achieve our main goal “to offer a high quality product and service to ensure a high degree of satisfaction and fidelity of our customers”.

Markets

Our Valves are used in many different applications such as oil and gas, upstream and downstream offshore, chemical, petrochemical & cryogenic services.

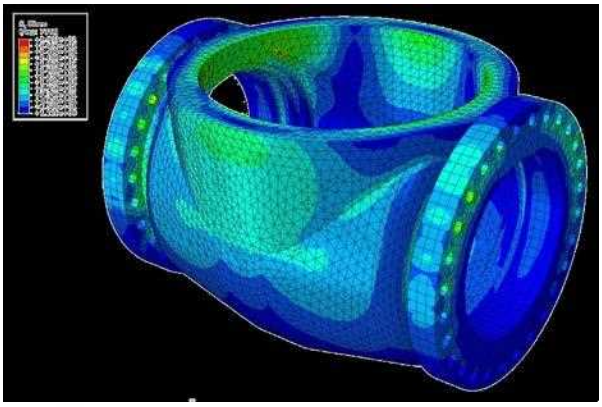
We provide spare parts to support our customers.

Design Research and Development

Using advanced software applications including Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD) and Casting Simulation helps GSSE’s engineers to design superior quality valves for any demanding performance requirement.

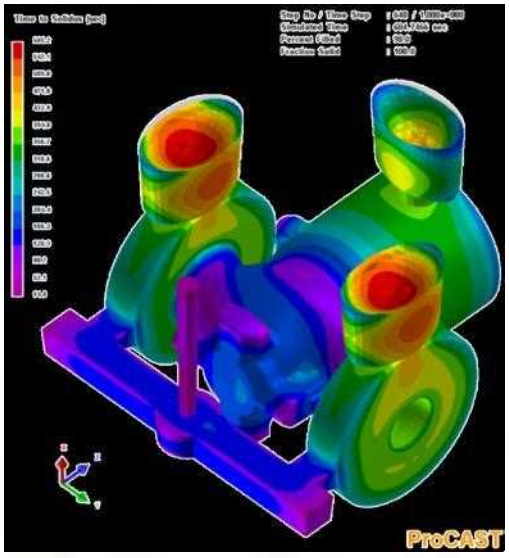
FEA Simulation

Stress calculation using 3D finite element analysis will be done for all GSSE products, specially for the pressure containing parts in control valves and pressure safety valves to make sure about safety factor in all required process conditions as well as testing criteria. We will also do custom design for our valuable clients .



Casting Simulation

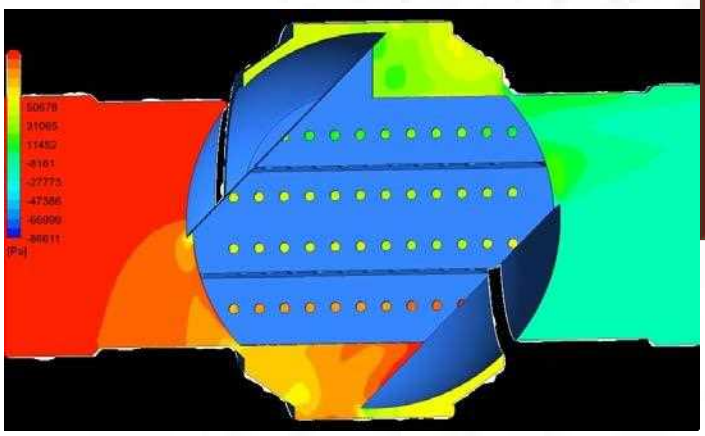
Casting process is simulated using the Finite Element Method (FEM). It allows the modeling of Thermal Heat Transfer (Heat flow), including Radiation with View Factors, Fluid flow, including mold filling, Stresses fully coupled with the thermal solution (Thermo -mechanics). Besides that, it includes also Micro structure/Heat treatment modeling, Grain structure modeling and Porosity modeling.



CFD Simulation

In a growing number of industries, numerical simulations of flow processes are becoming more and more popular and are increasingly used as a development tool. At the basis of this tool is a CFD (Computational Fluid Dynamics) code, which has already been integrated into numerous software programs.

Today, CFD tools are indispensable as a supplementary tool in control valve development in certain construction stages of a component CFD not only allows valve plugs and bodies to be optimized during the construction stages. It also permits to determine very high flow coefficients. This benefit plays a major role as only very few test benches are built to test valves in large sizes with the associated Cv coefficients. The increasing size of industrial plants, however; calls for higher flow capacities and consequently also larger valve sizes Non-optimized valve geometry is usually the main cause for many problems related to response time, actuation force and energy consumption.

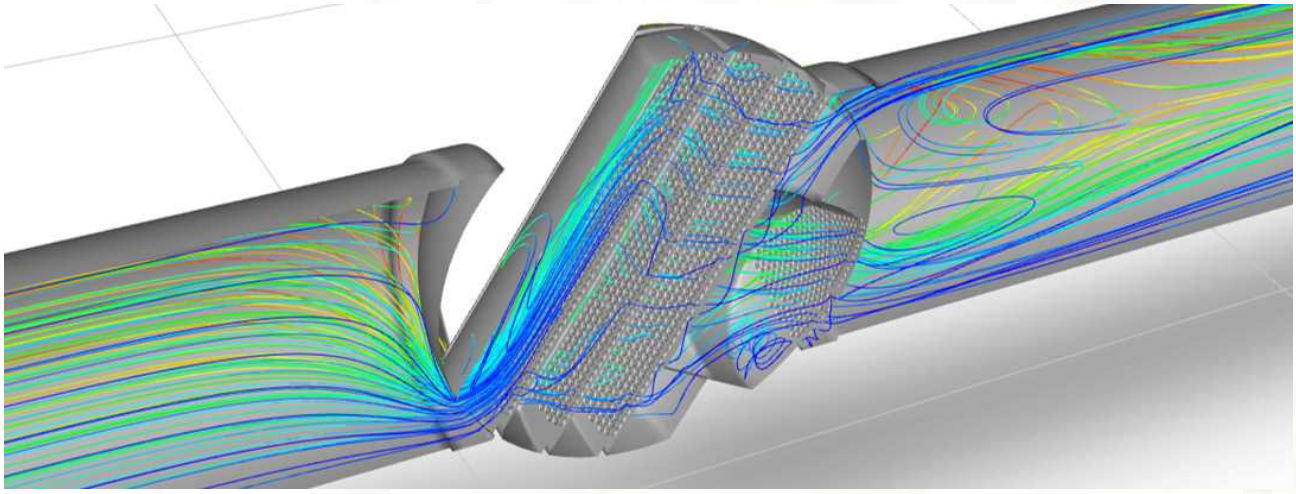


To overcome these limitations and problems we have done a thorough numerical and experimental analysis of control valves. The main influential geometry parameters of the control valve are defined for numerical analyses. In the next step the basic theory of the numerical simulation, including the 3D modeling, meshing and parameterization, is used. The validation of the numerical fluid model of the valve is done by comparing simulation and experimental results.

In control valves regulating the flow of liquid media, cavitation may occur depending on the process data and valve type.

Under cavitation conditions, the noise emission increases considerably and erosion can occur at the valve trim depending on the cavitation intensity.

Using CFD, the point of incipient cavitation can partly be determined. Cavitation is understood to mean the process during which the pressure at the narrowest now cross-section inside the valve reaches vapor pressure and the first small vapor bubbles start to form. These bubbles are dragged along by the flow into areas of higher pressures where they implode. Expressed in numerical terms, the process occurs when the static pressure inside the valve falls below the vapor pressure.



Control Valve

Contrarily to other types of valves, the function of control valves is to absorb a fraction of the inlet pressure to modulate the fluid flow rate and maintain under control the plant conditions.

In this process an amount of energy proportional to the pressure drop and the flow rate is converted into turbulences, heat, vibration, noise and wearing of valve components.

Best approach to the problem is the cage guided valve. In the cage guided design, the plug is guided along its full stroke by the cage, with very small clearance, so that vibration is suppressed. Cage guided design is recognized as the best design in heavy duty service control valves.

Designs include unbalanced plug disc for valve sizes up to 4" and balanced plug disc for valve sizes 3" and larger. The use of balanced plugs allows achieving Class IV and V seat leak rates, whichever the pressure and the temperature. Also, if temperature does not exceed 250°C / 480°F, Class VI (bubble tight) can be given as an option.

GSSE control valves have been designed to be operated by pneumatic, electric or electro-hydraulic actuators, including any type of accessories, at request, and accepting any type of control signals. When electric actuators / accessories are used all type of protections can be provided, including explosion proof or intrinsically safe.

Our designs have been successfully used in power plants as well as gas, oil, fertilizers and other process industries. Noise and vibration have been reduced, and valve internals life has been extended.

Sizing And Selection

We use latest version of CONVAL sizing software to calculates the flow properties based on client process specification, and select from the GSSE database the control valve which is the most accurate for this process.

Some of the possible parameters which can be calculated with this program are:

- Cv calculation
- Fluid properties and state in operation condition
- Noise level
- Fluid velocity
- Power loss inside the valve
- Two phase fluid conditions if it is required
- Actuator forces

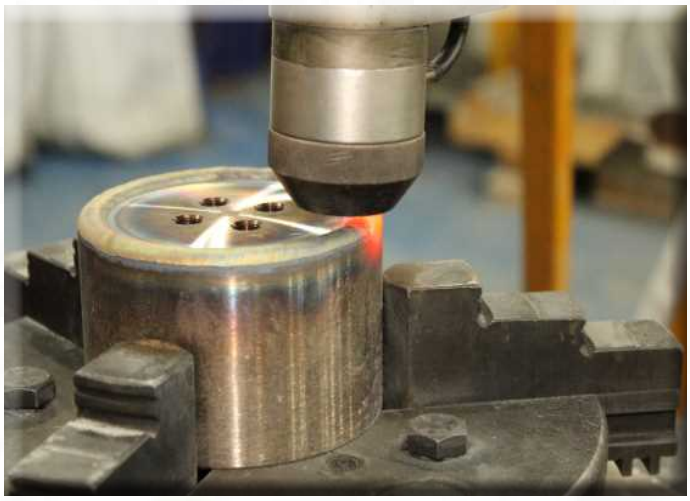
Hard Facing

Stellite No. 6 is the most common of all hard facing materials used in the control valve industry. It has one of the best combinations of corrosion, abrasion and impact resistance. In addition, it has a low coefficient of friction with itself and an even lower one with Stellite No. 12, for higher hardness, we use Stellite 6H which gives similar property like HVOF Tungsten Carbide.

We use PTA method for Stellite hard facing. The PTA process which is fully automated by KUKA robotic arm and programmable to do cladding on any seat , plug, disk nozzle etc. Providing a high degree of reproducibility of the weld overlays. In addition, because of the highly concentrated heat source, this process benefits from high powder utilization and can achieve a very low level of iron dilution in the overlay. Because the hard facing materials are in powder form, it is possible to produce overlays from many different materials and combinations of materials with a wide range of hardness and other properties.

Durability of leakage criteria in sealing area of control valves, pressure Regulator valves and pressure safety valves id highly depend on hard-facing of Stellite weld overlay in the seal parts all GSSE sealing area will be cladded by default to guarantee a long life function in our products.

We have full range welding and cladding facilities for the most famous brands in the different welding methods such as: Automatic Hot wire Tip Tig, Plasma Arc Welding , Micro Tig



Production Facilities

GSSE has in house modern CNC machining facilities up to 5 axis Siemens updated control systems enable us to do machining of 1/2 inch uo to 80 inch size for both turning and milling operation.

Our CAD-CAM are linked through network from engineering out put to manufacturing machinery.

Our Horizontal Boring machine equipped with NC Facing and Boring Head to do machining on large size valve bodies without rotating them.

Our CNC Vertical Turret Lathes equipped with Indexing chuck for machining on all valves sides in one setup, this will create an accurate geometry for valve body and bonnets

GSSE has a large storage of Casting Patterns for almost all of the products such as body , bonnet ,etc.

Most of the large size Patterns are made of aluminum and smaller sizes are made by 3D Printers.

Deep Drawing Dies , and diaphragm dies are all designed and manufactured by GSSE as and important part of our property.

We invested to have a massive stock of semi finished Body and Bonnets in various size , pressure class and material to save delivery time for our projects.

We have also a large inventory of semi finished products of trim parts , actuators, Balls , Seats Yoke other parts.

GSSE invested considerable sums on stoking forged raw materials in different grades from Caron steel to Inconel.

Testing & Quality Control

GSSE has its own in-house testing department, all inspections and tests are performed by qualified and experienced personnel in line with project specifications and data sheets in order to satisfy our Customers and their Commitments expectations. A Quality Control Plan (QCP) and an Inspection and Test Plan (ITP) appropriate to the scope of supply can be issued for Client approval before starting of production activities. Following tests will be done on our control valve products:

- NDT for all parts while manufacturing
- Spring test
- PMI (Positive Material identification)
- Hardness test in both destructive and non destructive
- Coating thickness & Adhesion test
- Hydrostatic testing
- Helium Leak Test for double security packings or Bellows assemblies will be done in house upon client request.
- FAT (Factory Acceptance Test) will take place in house including valve function , Stroking time and Travel, instrumentation proper function , Hysteresis and dead band .
- Capacity test will be done in house up to a certain limit upon client request as an optional test.

Additional tests will be done optional based mutual agreement.

Some of the controls , equipment and tests used in the quality control department:



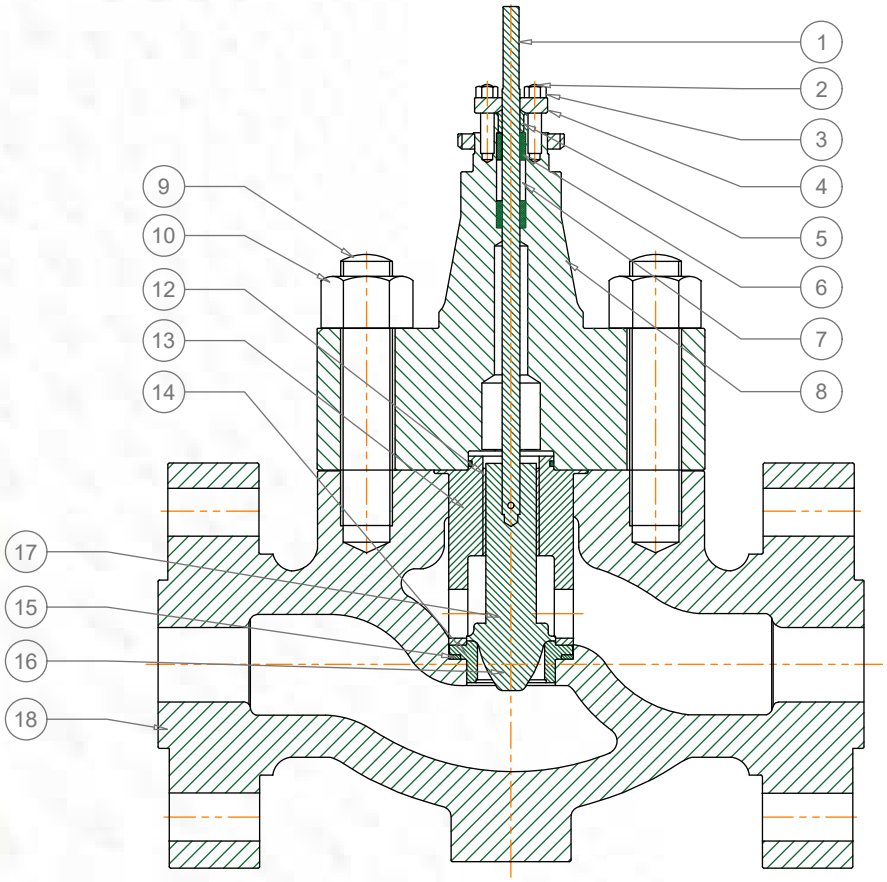


Control Valves

TG Series

Single ported, heavy top-guided control valves are designed with built-in versatility making them the most widely used control valve, well-suited to handle a wide variety of process applications.

Standard features include:



ITEM	PART NAME
1	Plug Stem
2	Packing Flange Stud
3	Packing Flange Nut
4	Packing Flange
5	Packing Follower
6	Packing
7	Lantern Ring
8	Valve Bonnet
9	Body Stud
10	Body Stud Nut
11	Body Gasket
12	Guide Bushing
13	Cage / Retainer
14	Seat Ring
15	Seat Ring Gasket
16	Plug
17	Plug Pin
18	Valve Body
19	Drive Nut

*: Not Shown

Size, Rating and Connection:

Flanged (RF,RTJ,T&G,FF): 1/2”-10” , ANSI 150-2500

Welded: SW: 1/2”-2” , ANSI 150-2500 / BW: 3/4”-2” , ANSI 900-2500 3”-10” , ANSI 150-2500

Screwed: 1/2”-2” , ANSI 150-600

Body Materials:

Carbon Steel

Stainless Steel

Super-alloy

Actuators:

Model DS Spring Diaphragm

Model DM Multi Spring Diaphragm

Trim:

Single Seat Plug Top Guided

Anti-noise and Anti-cavitation Trims, Single or Double Stage Are Available

Characteristic:

Standard: Linear or Equal% or Quick Opening

Anti-cavitation/Anti-noise: Linear

Cv Range:

0.1 - 640

Temperature Range:

-29 °C - 427 °C

Bellows:

The GSSE Standard bellows construction is an externally pressurized design that is capable of operating up to the full valve ANSI B16.34 pressure rating. Guides are located above and below the bellows providing excellent stability to withstand flow induced and mechanical vibration. Bellows material can be

- **Hastelloy C276**
- **Monel 400**
- **Inconel 625**

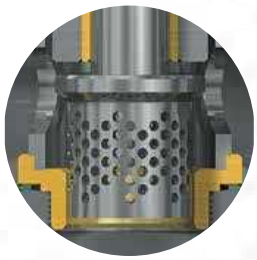
The standard packing box design and packing design options are used as a secondary stem seal.

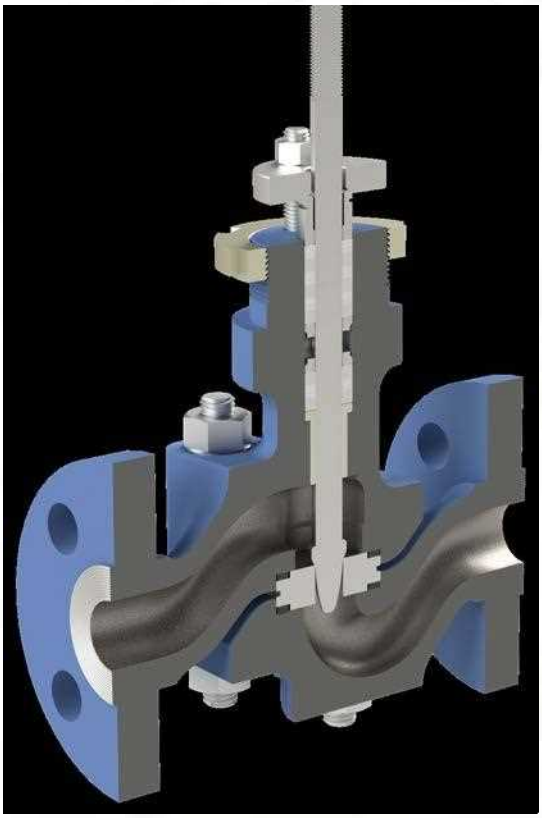
Soft Seat for Tight Shut off and Metal Seat , Double Stage Lo-dB / Anti-Cavitation Trim, and anti Noise trims are available on TG series.

GSSE Offers Split Body Control valve for TG series.

Lo-dB Trim Designs

The optional Lo-dB trim designs offer single-stage and double-stage noise attenuation benefits. Noise reduction levels of up to 25 dBA are possible, depending on the specific operating conditions.



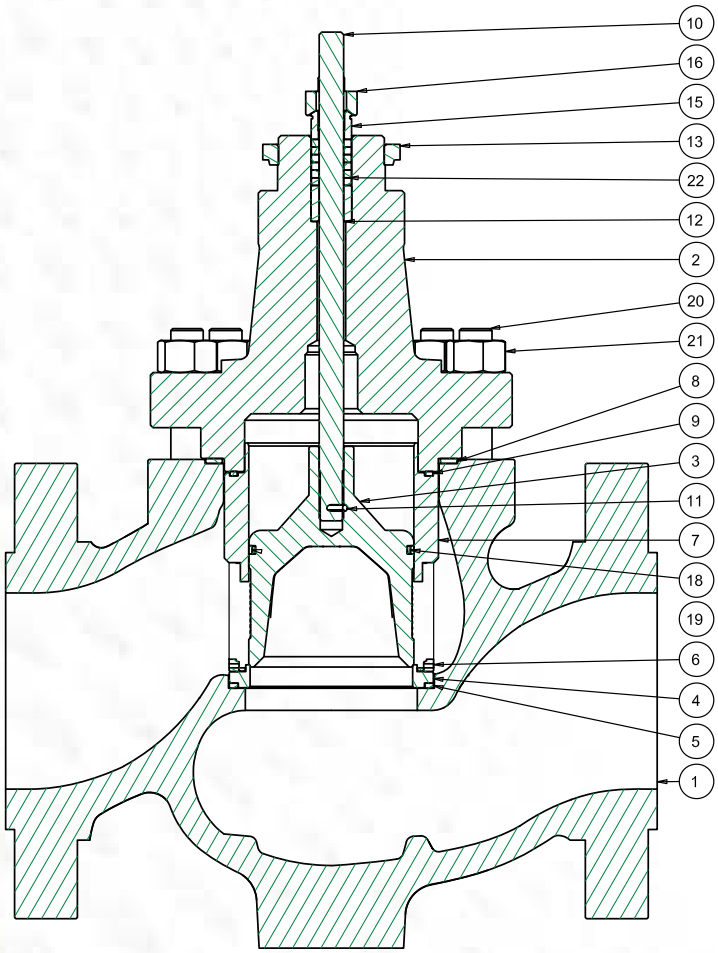


Typical Applications:

- Steam Turbine Generator
- Condenser
- Cooling Tower
- Reactor Building
- Turbine Building
- Reactor Facility Grounds & BOP
- Steam Turbine
- Gas Turbine
- Heat Recovery Steam Generator
- Balance Of Plant
- Distillation
- Hydro processing
- Reforming
- Cracking
- Blending
- Quenching & Fractioning
- Charge Gas Compression
- Separation
- Refrigeration

Control Valves CG Series

The rugged cage guiding, optional pressure balancing and a host of custom engineered trim designs makes these valves suitable for higher pressure drops and other sever service applications, where conventionally designed control valves fail to perform satisfactorily.



ITEM	PART NAME
1	BODY
2	BONNET
3	PLUG
4	SEAT RING
5	SEAT RING GASKET
6	COVER CAGE
7	CAGE
8	BODY GASKET
9	CAGE GASKET
10	STEM
11	PLUG PIN
12	GUIDE BUSHING
13	DRIVE NUT
14*	PACKING FLANGE STUD
15	PACKING FOLLOWER
16	PACKING FLANGE
17*	PACKING FLANGE NUT
18	INTERNAL SEAL RING
19	EXTERNAL SEAL RING
20	VALVE BODY STUD
21	VALVE BODY NUT
22	PACKING

*: Not Shown

Size, Rating and Connection:

Flanged (RF,RTJ,T&G,FF): 3/4”-14” , ANSI 150-2500 / 16”-24” , ANSI 150-1500

Welded: SW: 3/4”-2” , ANSI 150-2500 / BW: 3/4”-16” , ANSI 150-2500 / 16”-24” , ANSI 150-600

Body Materials:

Carbon Steel

Stainless Steel

Super-alloy

Actuators:

Model DS Spring Diaphragm

Model DM Multi Spring Diaphragm

Model PS & PD Cylinder

Trim:

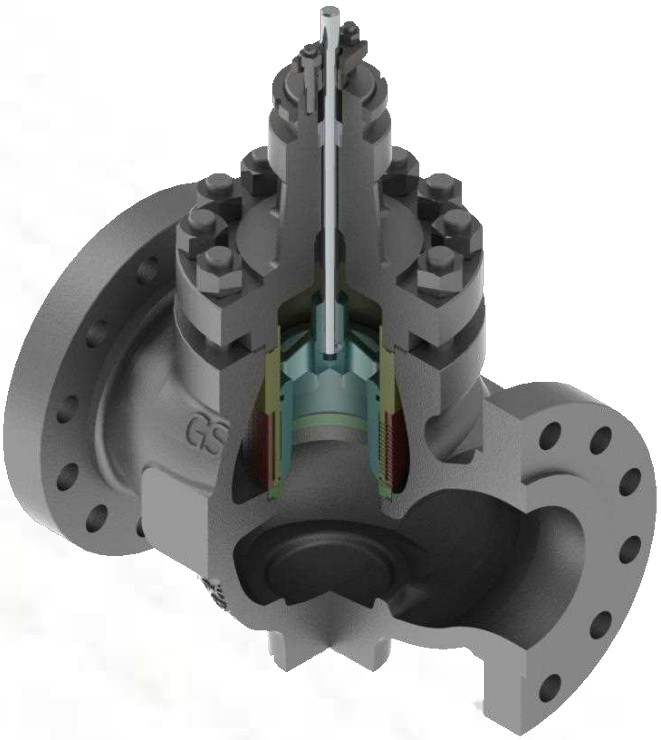
Single Stage (Anti-noise and Anti-cavitation)

Multi- Stage (Anti-noise and Anti-cavitation) or VRT

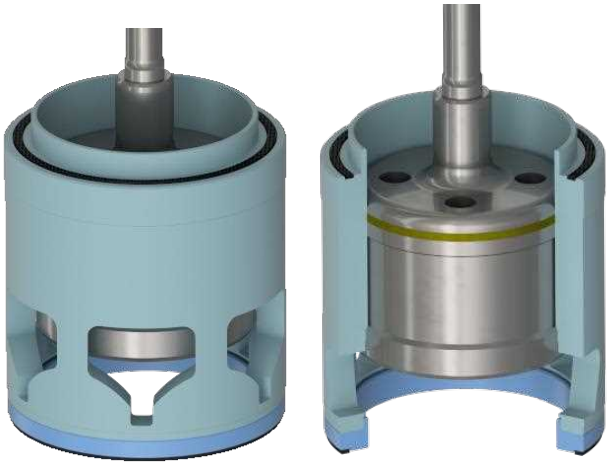
Characteristic:

Standard: Linear or Equal%

Anti-cavitation/Anti-noise: Linear



Applicable Trims on CG Series:



Standard Cage:
Linear, Equal Peresentage, Quick Opening

Lo-dB / Anti-Cavitation
Single Stage:
Linear, EQ%

Lo-dB / Anti-Cavitation
Multi Stage:
Linear

Lo-dB Single Stage with diffuser Cage:
Linear, EQ%
Linear, Equal Peresentage, Quick Opening

Anti-Cavitation
MultiStage:
Linear
Linear, Equal Peresentage, Quick Opening

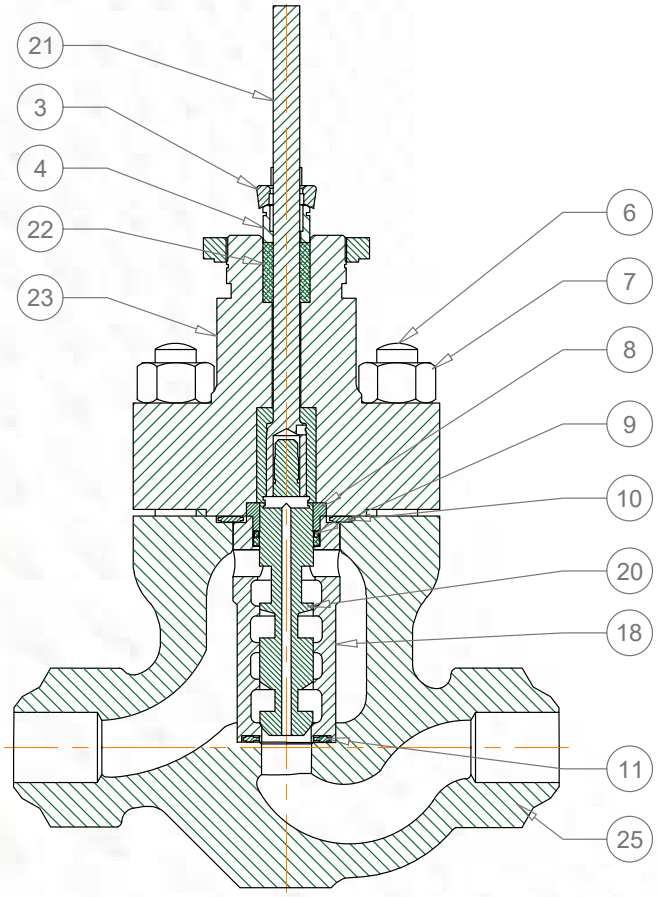
Variable Resistance Trim (VRT):
Linear

Typical Applications:

* HP heaters drains
* Moisture separator drains
* Feed tank supply
* Main feedwater valves
* Turbine Bypass
* Bypass to Atmosphere
* Steam Turbine
* Condenser
* Cooling Tower
* Reactor Building
* Turbine Building
* Reactor Facility Grounds & BOP
* Heat Recovery Steam Generator
* Balance Of Plant
* Distillation
* Hydro processing
* Reforming
* Cracking
* Blending
* Quenching & Fractioning
* Charge Gas Compression
* Separation
* Refrigeration
* Dehydration
* Refrigeration
* Liquefaction

Control Valves LG Series

LG series control valves offer excellent control of liquid services with high pressure drops , and entrained particulate. The dirty service anti-cavitation trims feature multi-stage protection against damaging effects of cavitation and erosive solids. Suitable for Pump Minimum Flow service.



Item	Part Name
1*	Packing Flange Stud
2*	Packing Flange Nut
3	Packing Flange
4	Packing Follower
5*	Drive Nut
6	Body Stud
7	Body Stud Nut
8	Seal Retainer’
9	Seal and Seat Backup ring
10	Body Gasket
11	Seat Ring Gasket
12*	Plug Pin
18	Liner with Integral Seat
19	Seat Ring
20	Plug
21	Stem
22	Packing
23	Valve Bonnet
25	Valve Body

*: Not Shown

Size, Rating and Connection:

Flanged (RF,RTJ,T&G,FF): 1”-8” , ANSI 300-2500

Welded: SW: 1”-2” , ANSI 300-1500 / BW: 1”-8” , ANSI 300-2500

Screwed: 1”-2” , ANSI 300-600

Body Materials:

Carbon Steel

Stainless Steel

Super-alloy

Actuators:

Model DS Spring Diaphragm

Model DM Multi Spring Diaphragm

Model PS & PD Cylinder

Trim:

Multi step axial flow (3, 4, 6, 8 and 10 stages)

Characteristic:

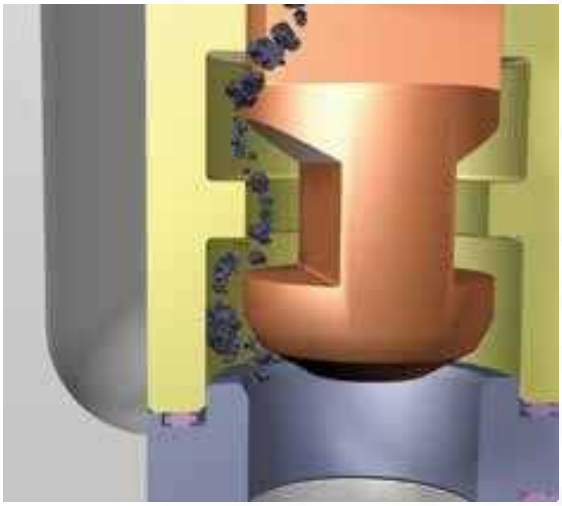
Standard: Linear

Optional : Mod. Equal

Multi-Stage, Axial Flow Technology

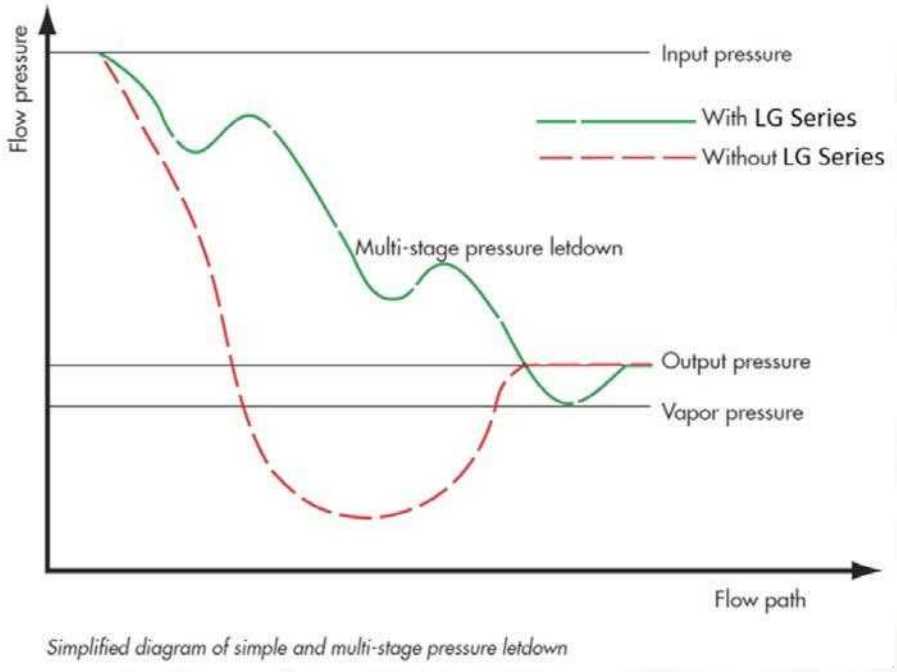
High trim velocity can intensify cavitation damage inside the control valve. This damage is common in many single-stage valve designs, which take the full pressure drop across a single region within the trim. This single region is typically the leading edge of the plug and seat — an area that experiences the highest velocity. Consequently, it receives the most severe and excessive damage. GSSE LG series available in Balance as well as Unbalanced Trim.

Dirty Service Support



Cavitation Elimination

The multi-step flow path created by the LG series trim design, reduces the pressure drop in multiple stages without allowing the local pressure to drop below the fluid vapor pressure thus preventing cavitation. active stages throttle in unison to avoid taking the full pressure drop across any individual stage.



Simplified diagram of simple and multi-stage pressure letdown

Specific Applications:

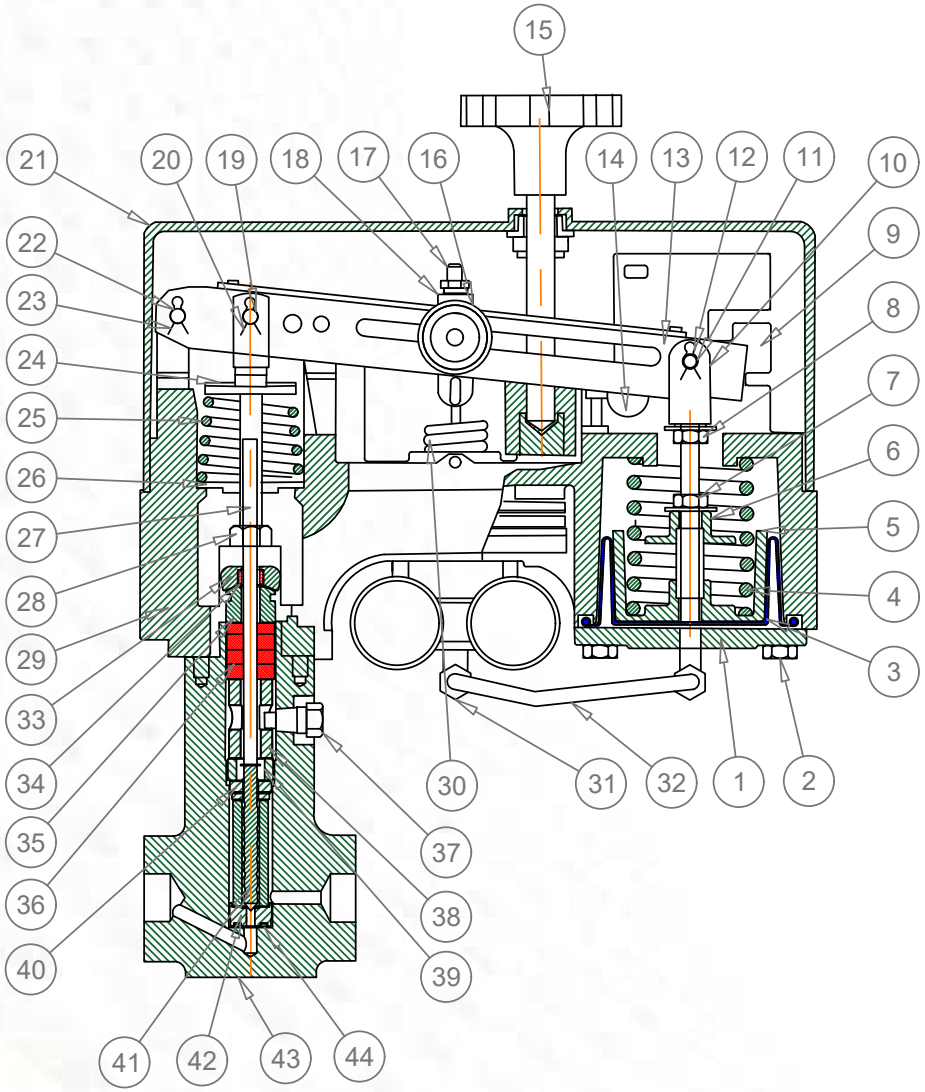
* Pump recirculation
* High-pressure liquid letdown applications,
* Especially for dirty fluid conditions.

Features:

* Multi Stage Trim (Anti Cavitation, Anti Noise Trim)
* Dirty Service Support
* Long Trim Life By Protected Seat Design
* Reliable Tight Shutoff (Metal & Soft Seat Design)
* Heavy Plug Guiding
* Angle Type Body Construction available

Control Valves MF Series

MF series designed specifically for low flow applications, the micro flow series provides excellent throttling control performance with a wide range of options and capabilities. Design optimization has also resulted in an extremely integrated and compact assembly.



Item	Part Name
1	Diaphragm Cover
2	Cover Cap Screw
3	Diaphragm
4	Spring
5	Diaphragm Plate
6	Limit Stop
7	Lock Nut
8	Lock Nut
9	Indicator
10	Yoke
11	Pivot Pin
12	Clip
13	Arm
14	Cover Plug
15	Adjusting Wheel
16	Internal Ad. Wheel
17	Adjusting Screw
18	Link
19	Pivot Pin
20	Clip
21	Cover
22	Pivot Pin
23	Clip
24	Spring Button
25	Conical Spring
26	Spring Plate
27	Stem
28	Nut
29	Main Body
30	Balancing Spring
31	Union Elbow
32	Tubing
33	Packing Flange
34	Mounting Nut
35	Packing Follower
36	Packing Ring
37	Safety Pin
38	Packing Spacer
39	Seat Ring Retainer
40	Retaining Ring
41	Plug Stem
42	Seat Ring
43	Valve Body
44	Seat Ring Gasket

Size, Rating and Connection:

Flanged: 1/2”-1” , ANSI 150-1500

Welded: SW: 1/2”-1” , ANSI 150-1500 / BW: 1” , ANSI 150-1500

Screwed: 1/2”-1” , ANSI 150-1500

Body Materials:

Stainless Steel

Super-alloy

Actuators:

Spring-opposed rolling diaphragm

Trim:

Contoured, heavy top guided

Characteristic:

Standard: Linear

Cv Range:

0.0016 to 3.8

Trim Construction:

Bull Plug

Multi Stage

Trim Material:

Stainless Steel

Duplex

Solid Stellite

Other Important Features

Standard Flangeless Design

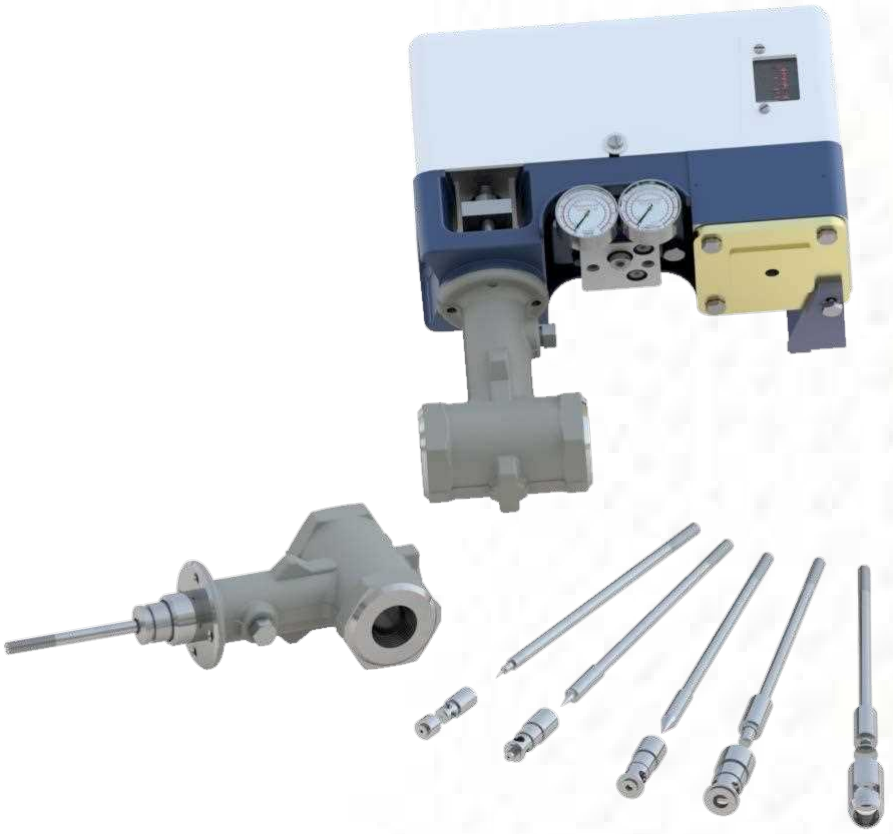
Anti-Cavitation Trim Design

High Pressure Design

Bellows Seal Design :

For applications that require zero leakage at the packing box, the MF valve is available with a Bellows seal. This design is ideal for applications that involve the handling of flammable, toxic, or explosive fluids.

Cryogenic Design



The MF multi-stage trim design for the this control valve provides unmatched anti-cavitation performance in low flow applications.

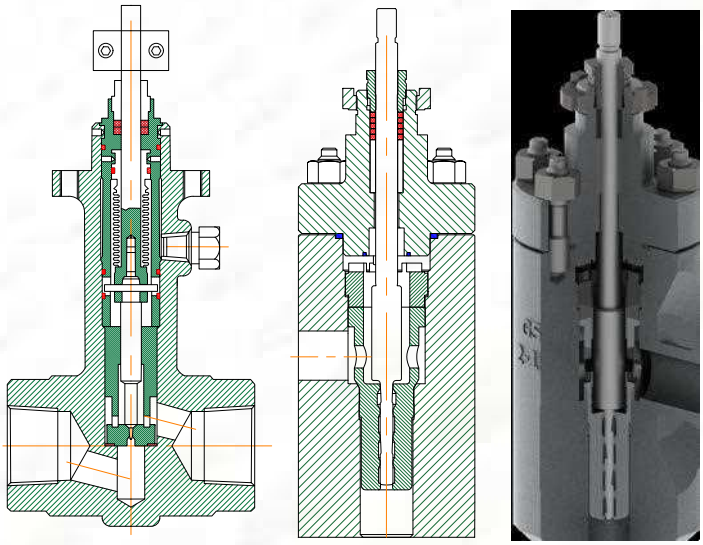
By reducing erosion and vibrations, this design helps minimize failure that is often associated with conventional single-seated valves. This trim is available with the standard body designs in either the flanged or flangeless con-figurations.

Adjustable Flow Coefficient (CV)

With the valve's adjustable Cv option, you can easily accommodate changing operating conditions. The Cv value can be increased or decreased simply by setting a knob within the actuator assembly .

Design Flexibility

Other standard configurations include a high-pressure ASME Class 2500 design, a zero-emissions Bellows seal design, and a design for cryogenic applications. The MF valve is also avail-able with an angle body design to accommodate existing piping configurations.

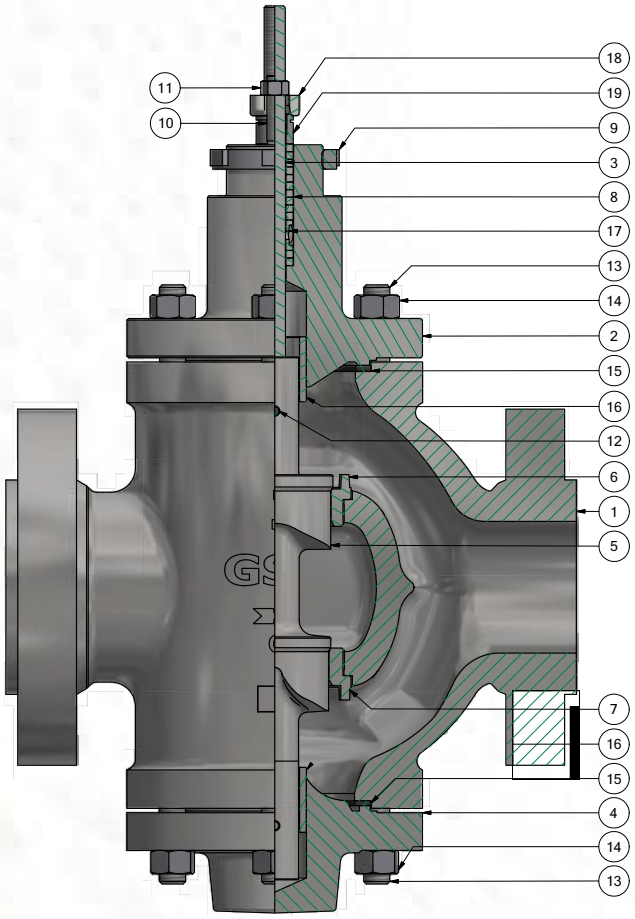


Specific Applications:

- Microflow applications
- Waste treatment plant
- Cooling Tower
- Primary pump cleaning injection
- Effluent treatment system
- Gas Turbine

Control Valves DP Series

The DP series double ported control valves Construction features have been carefully selected to provide optimum performance. The concept of the top and bottom guided double seated design helps to improve the rigidity of the valve at higher flow rates and pressure drops.



ITEM	DESCRIPTION
1	Body
2	Bonnet
3	Stem
4	Blind Flange
5	Plug
6	Upper Seat Ring
7	Lower Seat Ring
8	Packing
9	Drive Nut
10	Packing Flange Stud
11	Packing Flange Nut
12	Plug Pin
13	Body Stud
14	Body Nut
15	Body Gasket
16	Guide Bushing
17	Packing Spacer
18	Packing Flange
19	Packing Follower

*: Not Shown

Size, Rating and Connection:

Flanged (RF,RTJ,T&G,FF): 2”-12” , ANSI 150-1500 / 14”-24” , ANSI 150-600

Welded: SW: 3/4”-2” , ANSI 150-2500 / BW: 3”-12” , ANSI 150-1500 3”-10” , ANSI 150-2500

Screwed: 3/4”-2” , ANSI 150-600

Body Materials:

Carbon Steel

Stainless Steel

Super-alloy

Actuators:

Model DM Multi Spring Diaphragm

Model PS & PD Cylinder

Trim:

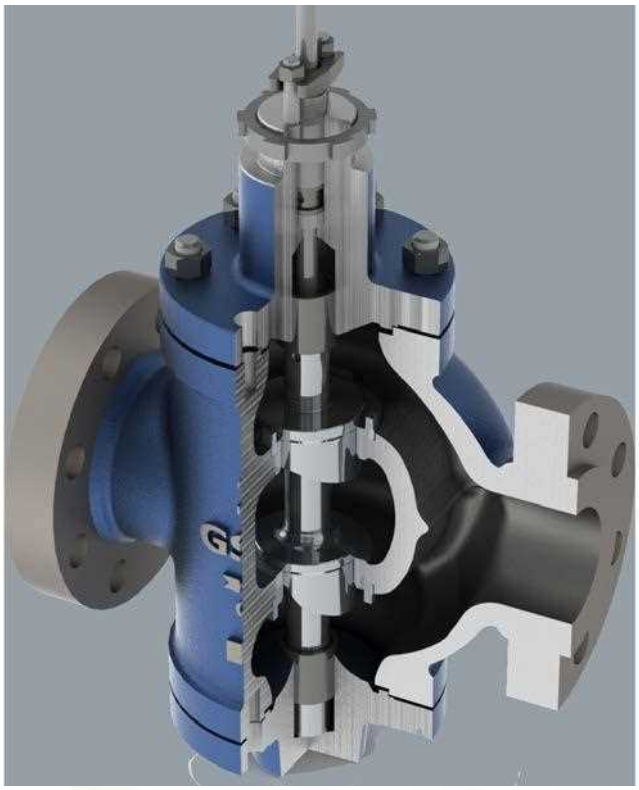
Double Seat, V-Port Or Contoured, Elastomer seat version for high leakage class.

Anti-noise trim for Steam management.

Characteristic:

Standard: Linear or Equal% or Quick Opening

Anti-cavitation/Anti-noise: Linear



Features:

The DP Series double seated control valves are semi-balanced designs, providing high allowable pressure drops, reduced actuator thrust requirements, and large flow areas to effectively handle dirty fluid applications. Standard features include:

Enhanced Performance and Reliability

Separate top and bottom guides in the GSSE DP Series provide heavy duty plug and stem support throughout the valve stroke range. This results in excellent throttling control characteristics and high product reliability.

High Pressure Drop Capability

The DP Series offers a semi-balanced trim construction, which allows for application in higher pressure drop applications using standard actuation. This also helps to reduce product complexity and overall assembly size and weight.

Dirty Service Design

Large flow areas within the DP Series design, makes it an excellent choice for applications involving dirty fluids. Foreign particles can pass through the valve without negatively affecting control performance.

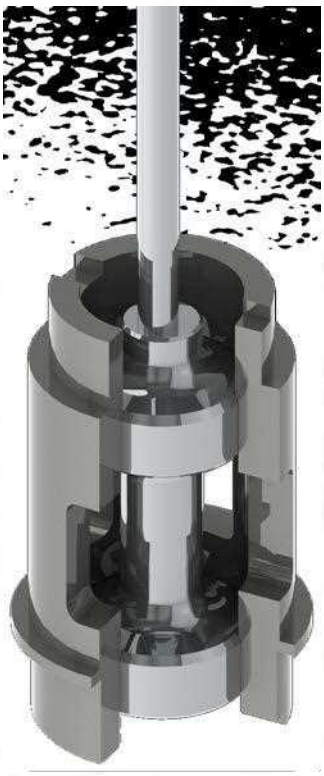
Easy Field Maintenance

The DP Series is designed for top and bottom entry, allowing for quick access to the key trim and soft good components. This also permits easy access to the top and bottom guides for repair or replacement.

Reduced Emissions

The DP Series can be supplied with the GSSE Low-E Packing design to provide low emissions performance

Applicable Trims on DP Series:

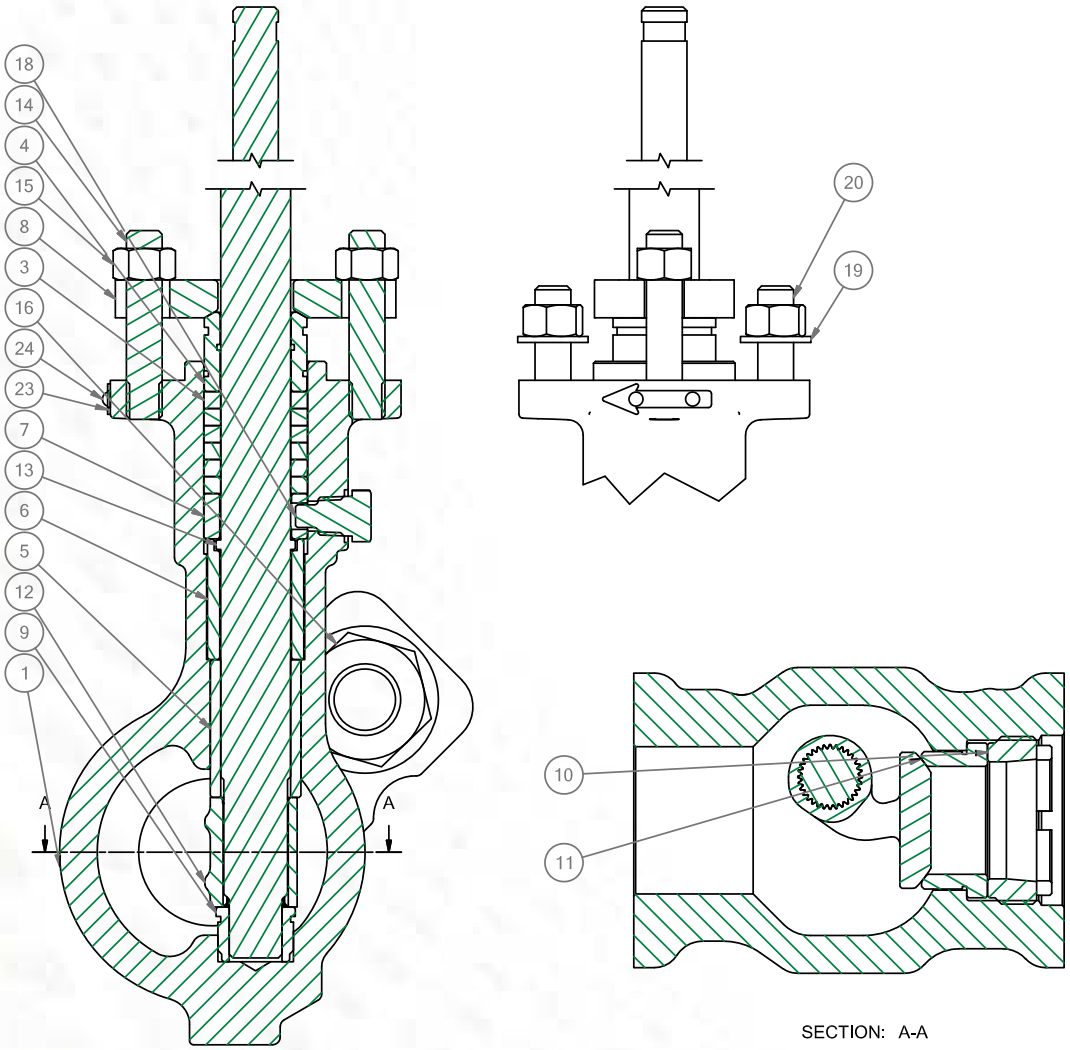


Typical Applications:

* Safety Injection Applications
* High Pressure Dorp while dirty Service
* Hydrocarbon processing applications
* Distillation
* Reforming
* Blending
* Quenching &Fractioning
* Charge Gas Compression
* Separation.

Control Valves RG Series

A heavy duty Rotary Globe control valve with Eccentric plug , excellent solution for high viscosity fluid application.



SECTION: A-A

ITEM	PART NAME
1	Body
2	Rotary Actuator - Range: 7-15 psig
3	Packing
4	Packing Follower
5	Upper Guide
6	Spacer
7	Packing Box Ring
8	Packing Flange
9	Lower Guide
10	Retainer
11	Seat Ring
12	Plug
13	Stem
14	Packing Flange Stud
15	Hex Nut
16	Washer
18	Safety Pin
19	Washer
20	Body Stud
21	Retaining Ring
22	Ball Bearing
23	Arrow
24	Rivet

Size, Rating and Connection:

Flanged : 1”-12” , ANSI 150-600

Flangeless (Mounting Between Flanges): 1”-12” , ANSI 150-300

Body Materials:

Carbon Steel

Stainless Steel

Super-alloy

Actuators:

Model DM Spring Diaphragm

Trim:

high capacity contoured plug

Characteristic:

Equal%

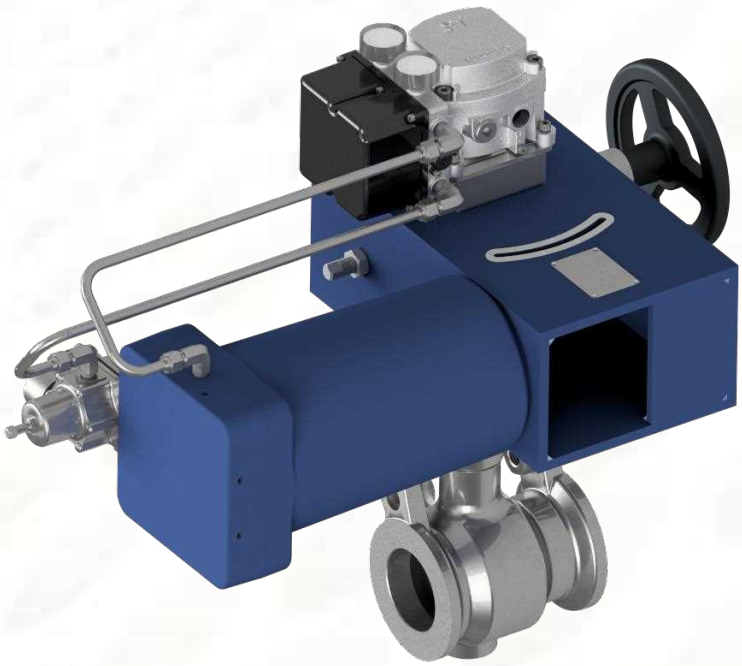
Features:

- The flangeless body rating is a rugged ASME Class 600.
- Heavy-duty guide lugs assure quick, positive alignment during installation.
- The flanged version is available in 1 in. through 12 in. (25 mm through 300 mm) sizes in 150 or 300 ASME, and 1 in. through 8 in. (25 mm through 200 mm) in 600 ASME.
- The optional GR (Globe Replacement) version is available in 1 in through 6 in. sizes (25mm through 150mm) in ASME Class 150, 300, and 600 ratings and allows direct replacement of conventional reciprocating globe valves.
- Separable bonnet design is available.
- Straight through flow pattern provides greater flow capacities.
- Standard integral extension bonnet allows for a wide range of fluid temperature applications (-320° F to 750˚ C),(-196˚ C to 400˚ C).

* The unique self-aligning eccentric rotating plug provides tight shutoff and low dynamic forces.

- A large variety of reduced-trim options are available in all sizes.
- The triple, over-sized bearing system provides exceptional plug shaft guiding.
- The shouldered shaft design provides robust blowout prevention.
- An optional differential velocity device (DVD) separates compressible flow streams into a high velocity core and a low velocity envelope flow stream. This provides up to 18 dBA noise attenuation.
- Optional alloy constructions are available.
- The powerful, low-profile, spring-diaphragm actuator guarantees positive fail-safe action.
- Splined shaft and actuator linkages, combined with low-friction techniques, contribute to reduced dead band and hysteresis.
- The valve position indicator is large and highly visible.

* The actuator linkage (purge option available) is totally enclosed).
* Dirty Service Support for viscose fluid

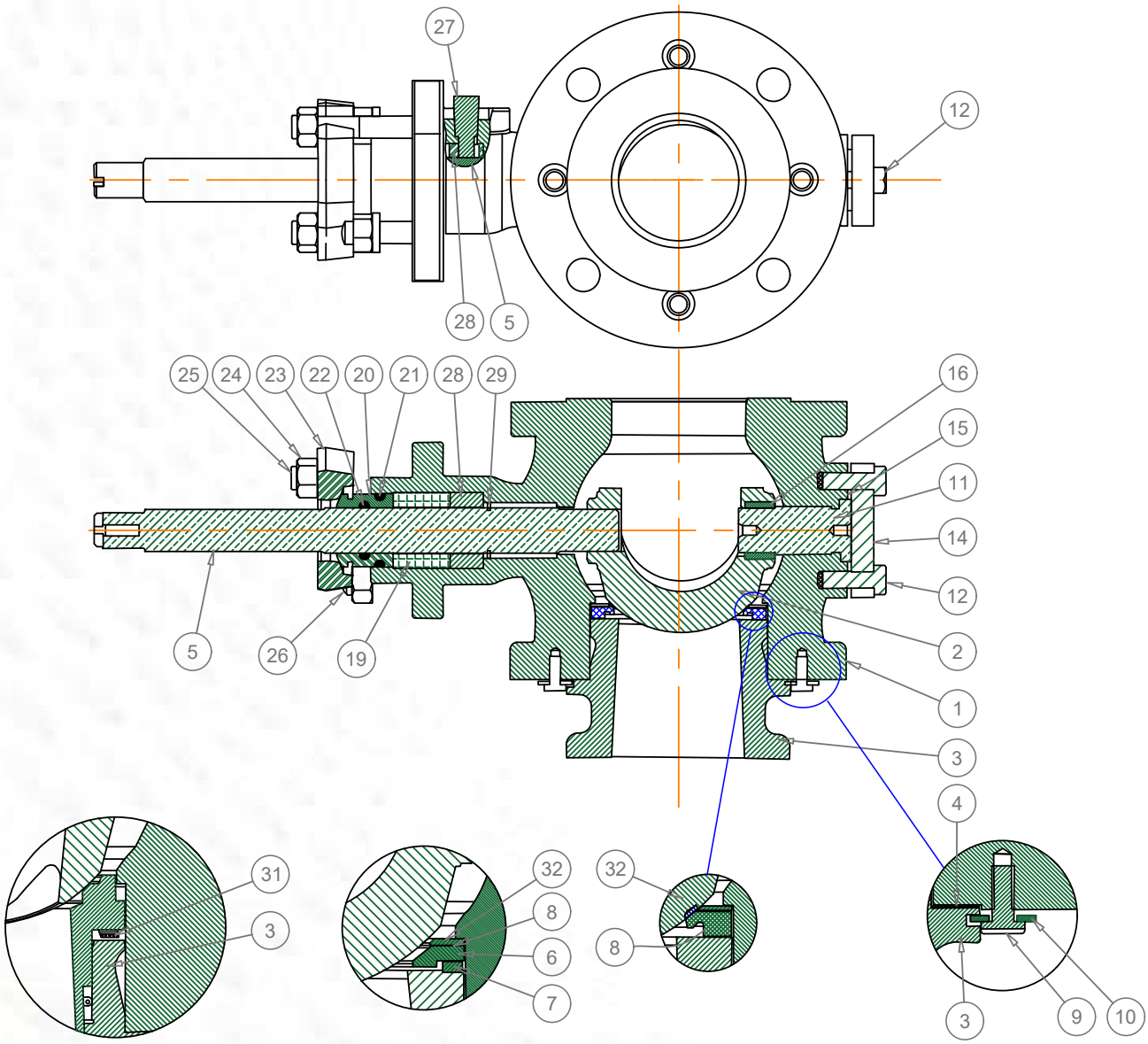


Specific Applications:

* Low pressure heaters drain
* Ventilation system
* Aggressive acids Service
* Hydrofluoric and sulfuric acid applications.
* Sludge & solid particle content service

Control Valves SB Series

A heavy duty ball control valve with parabolic segment ball, excellent solution for high viscosity fluid application.



Size, Rating and Connection:

Flanged : 1”-12” , ANSI 150-300

Flangeless (Mounting Between Flanges): 1”-12” ,

ANSI 150-300

Body Materials:

Carbon Steel

Stainless Steel

Super-alloy

Actuators:

Model DM Spring Diaphragm

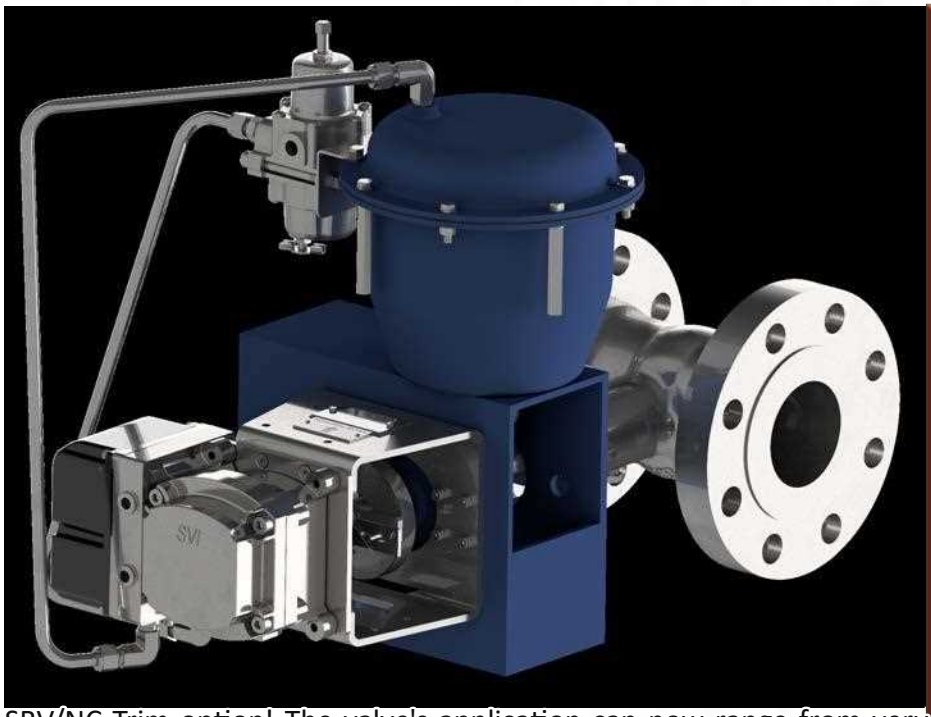
Trim:

high capacity “V” contoured segmented ball

Characteristic:

Equal%

ITEM	PART NAME
1	Body Flanged
2	Ball Plug
3	Retainer Standard (ISA S75.04)
	Retainer Extended (ASME B16.10)
4	Gasket (retainer body)
5	Stem Shaft
6	Backup Ring (flat metal seat)
7	Gasket (flat metal seat)
8	Seat Ring Flexible Metal
	Seat Ring
	Seat Ring Heavy Duty Rigid
9	Slot Button Head Screw
10	Flat Washer
11	Pin Shaft
12	Cap Screw, End Flange
14	End Flange
15	Gasket Pin Shaft
16	Lower Bushing
17	Upper Bushing
19	Packing Set
20	Packing Follower
21	O-Ring
22	O-Ring
23	Packing Box Flange
24	Nut, Packing Flange Stud
25	Stud, Packing Flange
26	Stud, Bonnet
27	Safety Pin
28	Packing Adapter
29	Shaft Ring
30	Radial Seal, HD Seat
31	Wave Spring, HD Seat
32	Seat Support Ring, Downstream



SBV/NC Trim option! The valve's application can now range from very low-flow and high accuracy service. This is ideal for additive and coloring lines and pilot plants. Cavitation and aerodynamic noise is also reduced. This Trim is a self-cleaning design which handles contaminated flows without plugging.

Option

The SB/NC Trim option can help with liquid cavitation and aerodynamic noise problems. The pressure drop is divided into a series of small pressure drops and separates the flow stream into many small jet streams. This provides a combination of cavitation/noise abatement with high capacity, high rangeability and the capability to handle impure fluids.

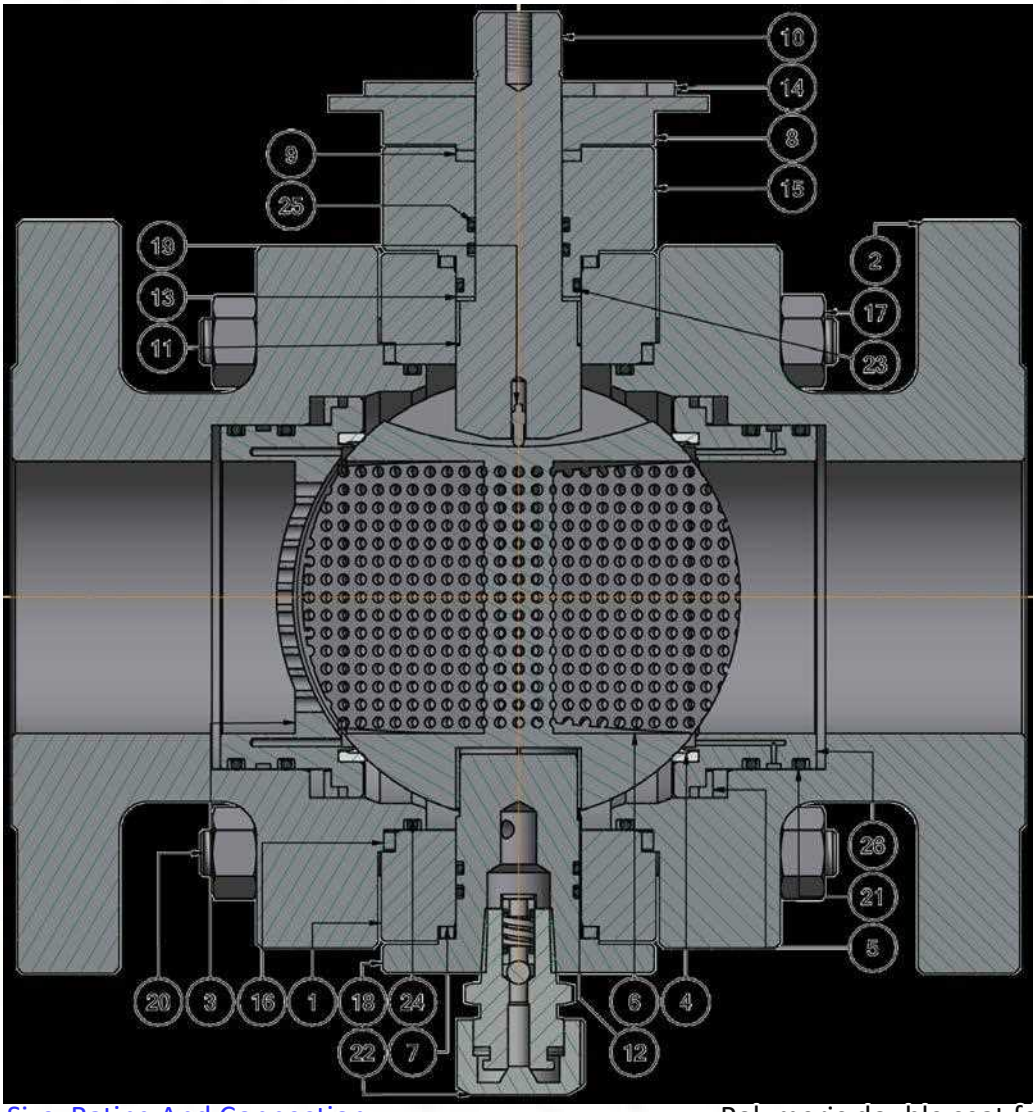
Specific Applications:

* Low Pressure Steam
* Medium Pressure Steam
* Molecular sieve
* Hydrogen service
* Emergency Shut down
* Hot oil installations
* Gas dehydration and regeneration
* Critical and Lethal service
* Cryogenic service
* Sand slurry
* Frequent cycling service

Control Valves NABA Series

Multistage Cage Ball

Heavy duty automatic throttling control ball valve for Surge Control. Available in segment ball and full ball type.



ITEM	PART NAME
1	Body
2	Closure
3	Drilled Seat Ring
4	Seat Insert
5	Seat Follower
6	Ball
7	Gasket
8	Top Flange
9	Gasket
10	Stem
11	Stem Bearing
12	Trunnion Bearing
13	Thrust Washer
14	Stop Plate
15	Gland Cap
16	Body Gasket
17	Body Nut
18	Bottom Flange
19	Grounding Plunger
20	Body Bolt
21	O-Ring
22	Vent Valve
23	O-Ring
24	O-Ring
25	O-Ring
26	Seat Ring

Size, Rating And Connection:

2”-42” ,ANSI 150 - 4500

API Rating: 2000 to 7500 psi

Intermediate ratings also available

Body Materials:

Per Customer Requirements

Carbon Steel, Stainless Steel, Monel, Inconel, Hastelloy

Actuators:

GSSE Model DS Pneumatic Spring Diaphragm

GSSE Model PS Pneumatic Spring Cylinder

GSSE Model SY Pneumatic Scotch Yoke

GSSE Electrohydraulic

Electro-Gearbox

Seat Design:

Standard:

Single upstream metal seat

Optional:

Polymeric double seat for Double Block and Bleed

Trim:

Segment, V port, Special

Characteristic:

Modified Linear, Modified Equal Percentage

Temperature Range:

-29° C to 250° C

(-20° F to 482° F)

Options:

- Ball expansion for multi-phase service
- Bi-directional flow
- Extended stem for buried service
- Low-emission stem seal design according to ISO test standards
- Special trim for low and high temperature service
- Expanded end connections to match piping size
- Fire safe approved

Features:

Superior Flow Capacity

GSSE Ball valve offers superior flow capacity compared to cage style valves. GSSE features a control trim design that permits less restriction and greatest capacity when demand requires.

Aggressive Noise Attenuation

We provides the maximum noise attenuation of Ball Valve range. The multi-stage trim design dissipates kinetic energy by forcing the fluid through a series of pressure reducing holes and angles. This frictional path decreases velocity and vibration – providing up to 25 dB of noise attenuation.

Wide Controllability

Natural gas systems often call for control of a wide range of flow rates. Rotary design offers high turndown ratio (200:1) for excellent control range. A wide flow range can be controlled by a single run where cage style valves require multiple runs and valves.

Minimize Emissions

The rotary quarter turn design of our Ball valve provides quick, easy and low impact automation. The constant linear motion forces associated with globe and axial valves can cause damage to stem packing, releasing fugitive emissions.

The quarter turn design incorporates pressure seal seating technology that does not require excessive forces to ensure flow shutoff.

Compact Size

The high capacity NABA Ball design allows for the valve to be one or two sizes smaller than cage style valves. Not only does this reduce the station footprint, but less material and resources are required to support the valve.

Bi-Directional Control

Our design provides standard bi-directional flow capability without sacrificing control accuracy. This can reduce a system's assets up to 50% – cage style valves may require a valve and supporting materials for each direction.

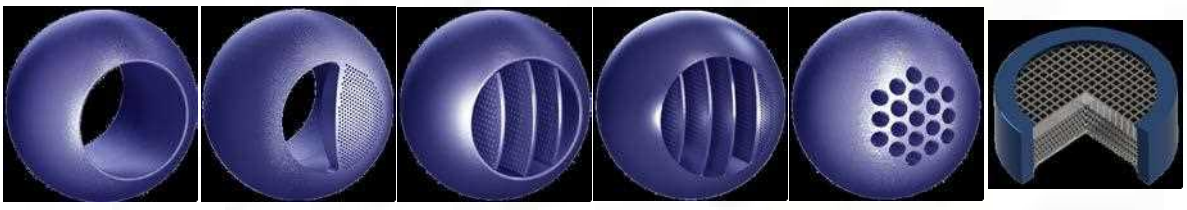
High Pressure Differential

Through an aggressive multi-stage pressure let down design, is capable of handling pressure differentials over 1500 psi (104 bar). For extremely severe conditions, Stellite weld overlay can be applied to provide further erosion resistance.

Customized Configurations

Applications vary in service requirements. GSSE Ball valve can be configured in an array of exotic materials, ANSI class ratings, and end connections. Material selection is based on fluid composition and process conditions to maximize performance and service life. For the most aggressive

T Ball Model	TO	T1	T2	T3	T4	Attenujet
Noise Attenuation	Baseline	7 dBa	17 dBa	20 dBa	25 dBa	15 dBa



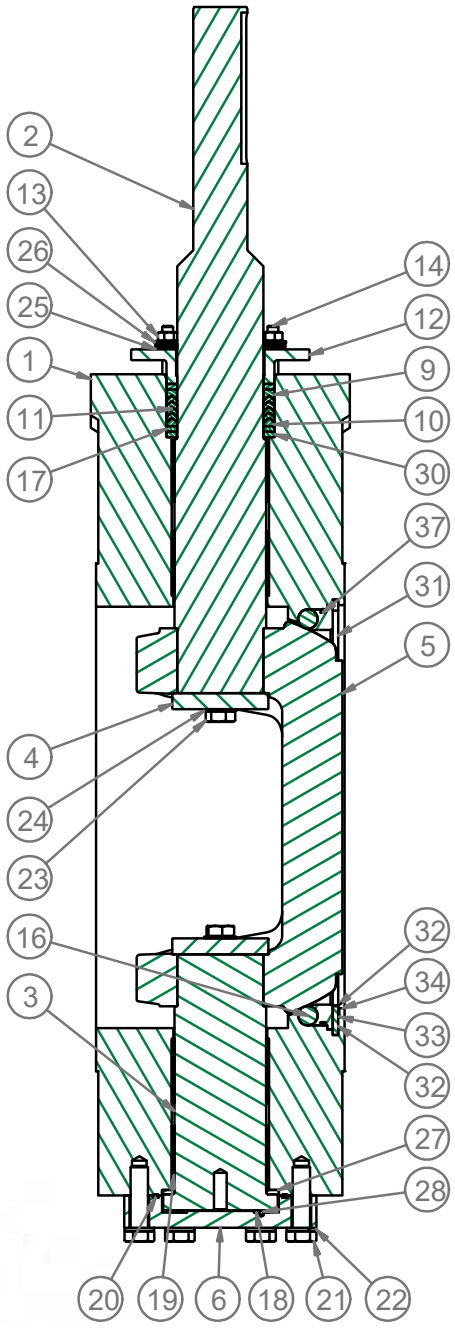
Typical Applications:

- Hydrocarbon Processing, Petrochemical, Power Generation and Pulp & Paper industries
- Gases, Liquids and Steam, pure or impure.
- Flow and Pressure control in general & demanding services.
- Blow down.
- Flare control
- Pressure equalization.
- High temperature service.
- Tight shut-off requirements.

Control Valves BFD Series

High performance butterfly valve with one piece body , It is specially designed for industrial gas applications featuring long-lasting tight shut-off capability, excellent flow characteristics and long service life.

ITEM	PART NAME
1	Bearing
2	Bearing
3	Body
5	Cover
6	Disc
7	Disc Clamp
8	Disc spring
9	Drive shaft
10	Gland
11	Hexagon head screw
12	Hexagon head screw
13	Hexagon head screw
14	Hexagon head screw
15	Hexagon nut
16	Hexagon nut
17	Key
18	Locking plate
19	Packing (Female)-W
20	Packing (Male)-W
21	Retaining ring
22	Ring
23	Seal
24	Seal (Cover)
25	Sealing element
26	Sealing ring
27	Shaft
28	Stud
29	Thrust bearing
30	V Packing-W
31	Washer



Function: Control, shut-off

Body: WCB A 216, Stainless Steel
Duplex, Aluminum Bronze

Seat: Soft Seat, Metal Seat

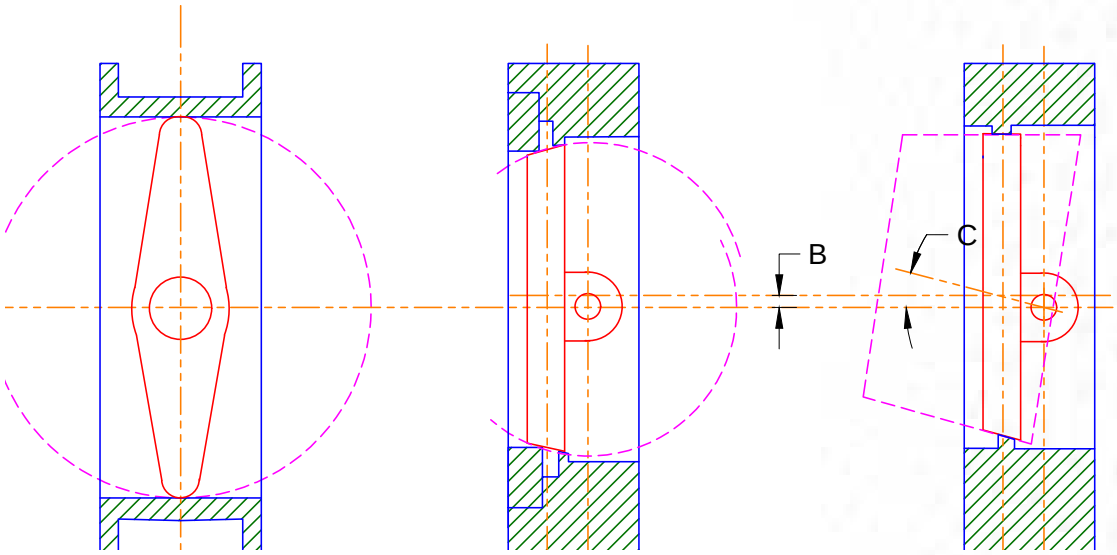
Size: 3 to 64 Inch

Body Connection: Lug, Wafer, Double Flange

Temperature: -16°C to 250 °C

Optional Features: Fire Safe Design

Butterfly Valve different Types



Concentric Butterfly Valve | Double Eccentric Butterfly Valve | Triple offset Butterfly

Butterfly valves are among the most popular industrial quarter-turn valves that control different fluid media flow-through systems. They come in different designs, offering varied advantages, such as the quarter-turn control, small dimensions for use in areas with limited space, and excellent control capabilities. They are also light, cheaper, and allow for a highcoefficient, making them useful in many applications **Centric or concentric butterfly valves**

Concentric butterfly valves are suitable for low-pressure applications. A concentric butterfly valve is the most basic type. The spindle passes through the centerline of the disc, located at the center of the pipe bore. The valve seat sits in the inside periphery of the valve body. The disc contacts the seat at around 85° during a 90° rotation. This design is known as resilient-seated because it relies on the rubber seat to efficiently seal the flow when closed.

Eccentric butterfly valves

Eccentric butterfly valves have the stem passing behind the disc's centerline, on the opposite side of the disc to the flow direction. These valves can be single-offset, double-offset, or triple-offset.

Single-offset: Stem is located right behind the centerline.

Double-offset: Referred to as doubly eccentric, these valves have the stem behind the disc with an additional offset to one side, enabling the disc to rub over the seat for only 1-3° of rotation during closure.

Triple-offset butterfly valve (TOV or TOBV): These are similar to double-offset valves, but the third offset makes these valves more efficient and resistant to wear and tear. GSSE BFD is a double eccentric butterfly Valve, manufactured in Soft Seated and Metal Seated Versions

Typical Applications:

Process

Sour Gas

Steam

Vacuum

Water and

Wastewater treatment

MEDIA

Acids

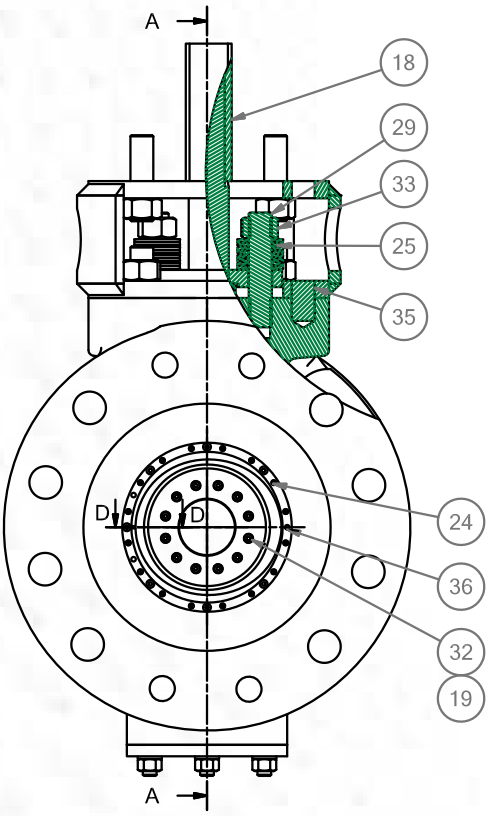
Alkali's

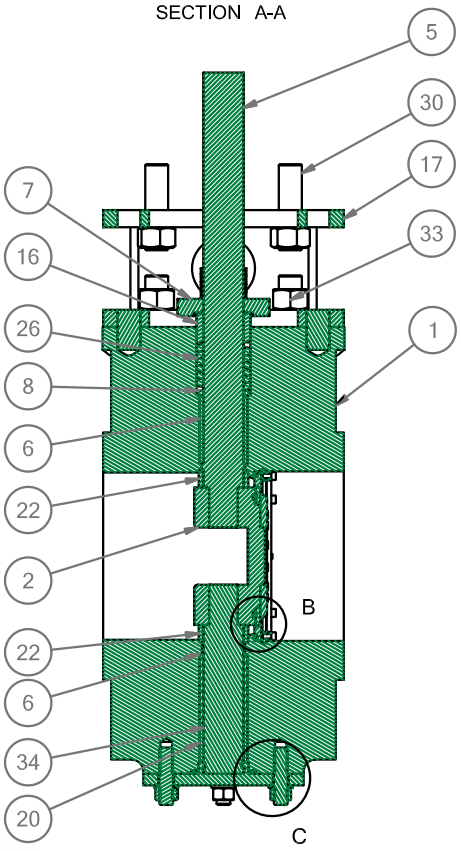
Corrosive Chemicals

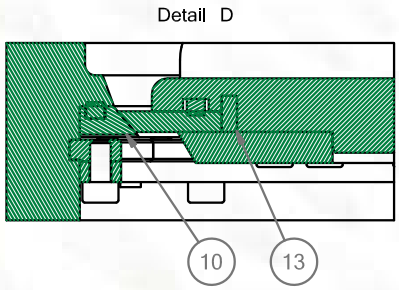
Gases

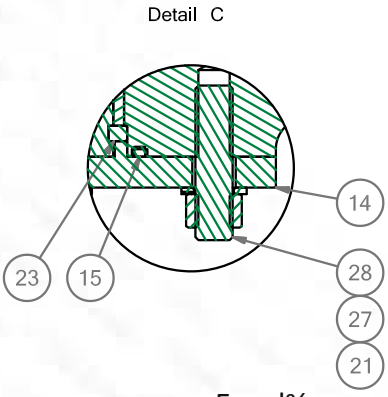
Hydrogen

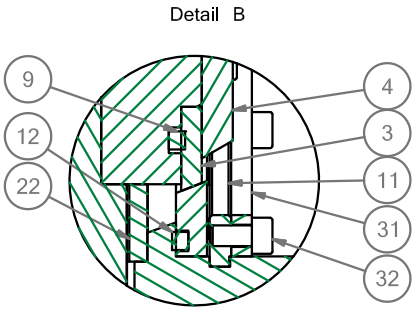
The triple offset has been designed to support extreme service conditions, whether of high temperature or high pressure, the design has been developed in order to completely eliminate friction between the seat and the disc seal ring.











Size, Rating and Connection:

Size : 2”-48” , ANSI 150-1500

(Wafer, Lug, Double Flange, Butt weld)

Body Materials:

Carbon Steel

Stainless Steel

Super-alloy

Actuators:

Pneumatic, Hydraulic, Electric

Trim:

Soft Seat , Metal Seat , Laminated

Characteristic:

Equal%

Optional Tightness

ANSI Class V and VI

API 598

Temperature Range

-320°F to +1050°F (-196°C to +566°C)

Cv

10 to 100000

Other Size, Material and Pressure Ratings Available upon Request

Butterfly Valve different Types

ITEM	PART NAME
1	Body
2	Disk
3	Seal Ring
4	Disk Pressure Ring
5	Upper Stem
6	Sleeve (Body)
1	Gland Plate
8	Connect Ring
9	Gasket (Seal Ring)
10	Seat
11	Seat Retainer
12	Gasket (Seat)
13	Seal Ring Pin
14	Flange
15	Gasket (Flange)
16	Sleeve (Extention)
11	Yoke
18	Rectangular Key
19	Spring Washer (Disk Pressure Ring)
20	Spacer(Body)
21	Spring Washer (Gland)
22	Spacer(Disk)
23	Split Collar
24	Set Screw (Seat Retainer)
25	Disk Springs
26	Packing
27	Nut (Extention and Flange)
28	Stud bolt (Flange)
29	Stud bolt (Gland)
30	Stud bolt (Extention)
31	Seat Retainer Ring
32	Bolt (Disk Pressure Ring)
33	Nut (Gland)
34	Bottom Stem
35	Yoke Pin
36	Seat Retainer Pin

Features and benefits

Triple offset Geometry

Non-rubbing rotation of the segment resulting in less wear, longer life and Tighter shut-off

Zero Leakage-Bi-directonal

Class VI shut-off

Ease of maintenance

Only design that offers a filed replaceable seat and seal ring

Torque Seated design

Able to compensate for temperature and pressure flactuation

Resilient Metal Seat

Provide repeatable long term sealing performance

Flexibility of Design

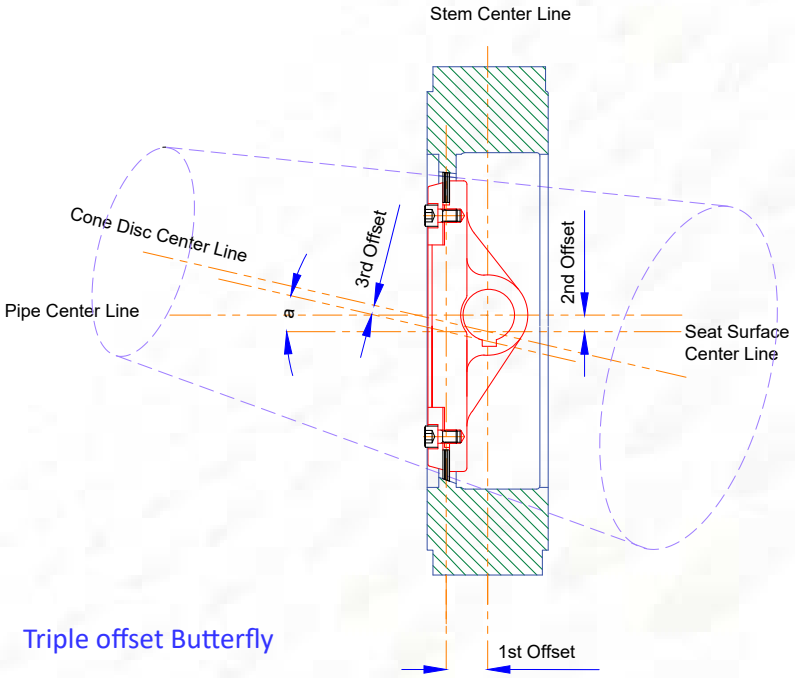
Can be designed to unique requirements of application

Fire safe Design

No soft components in construction

Solid Proof Design

Including protection for bearings and sealing element



Triple offset Butterfly

Typical Applications:

- Process
- Sour Gas
- Steam
- Vacuum
- Water and
- Wastewater treatment

Media:

- Acids
- Alkali's
- Corrosive Chemicals
- Gases
- Hydrogen

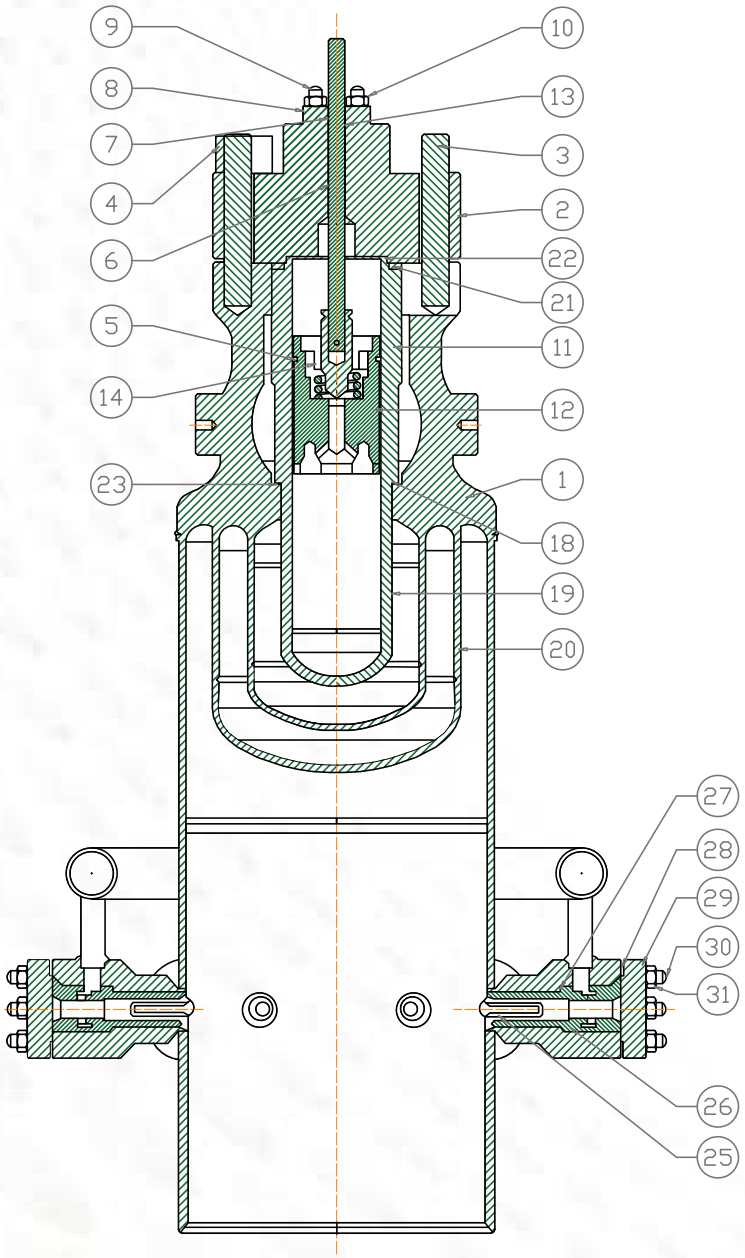
Sever Service Control Valve

SF Desuperheater Configuration

Steam conditioning or desuperheater control valve.

We offer compact series and globe Type in cast and forged material .

This package is designed to manage steam condition by injection of water into passing steam



Item	Part Name
1	Body
2	Bonnet
3	Body Stud
4	Body Nut
5	Guide Bushing
6	Packing S/A
7	Packing Follower
8	Packing Flange
9	Packing Flange Stud
10	Packing Flange Nut
11	Cage
12	Plug
13	Pilot Spring
14	Auxiliary Pilot Plug
15	Retaining Ring
16	Stem
17	Grooved Pin
18	Seat Ring
19	Seat Ring Diffuser
20	Diffuser
21	Conical Spring
22	Body Gasket
23	Seat Ring Gasket
24	Seal Ring
25	Nozzle S/A
26	Nozzle Holder
27	Nozzle Gasket
28	Nozzle Flange Gasket
29	Nozzle Housing Flange
30	Nozzle Flange Stud
31	Nozzle Flange Nut
32	Flow profiler/Lo-dB plate

Size, Rating and Connection:

1”-48” ,ANSI 150-4500

Body Materials:

Carbon Steel

Stainless Steel

Super-alloy

Trim:

Contoured, Heavy Top Guided, Multi-staged Anti-cavitation

Characteristic:

Linear

Actuators:

Model DS Pneumatic Spring Diaphragm

Model PS Pneumatic Spring Cylinder

Model PD Pneumatic Double Acting Cylinder

Electrohydraulic

Electronic

Temperature Range:

648 °c

Body Construction:

Angle Type

Straight Globe

Spray Nozzle :

Solid Tungsten Carbide

Valve Design :

Flow to Close

Flow to Open

Features

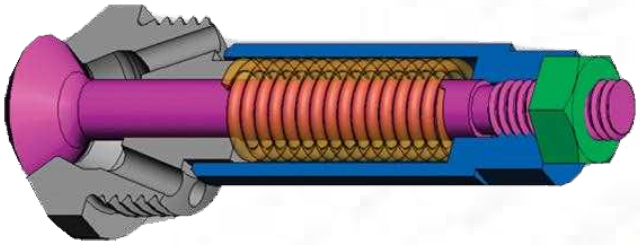
The GSSE SF Series Steam Form steam conditioning valve combines years of successful experience in steam pressure control with the latest technological development in water injection and desuperheating. The Steam Form's unique design is engineered to provide the most efficient water vaporization and superior temperature control

High Performance Design

GSSE SF Series heavy-duty globe control valves are engineered to handle the most demanding process conditions and exceeds the capabilities of comparable designs. The cage guided design of the SF Series is structured for the severe service conditions and intermittent operation which is common in steam conditioning and turbine bypass applications. This construction allows for cyclical operation which accommodates large thermal transients.

Advanced Water Injection System

Tight Shutoff



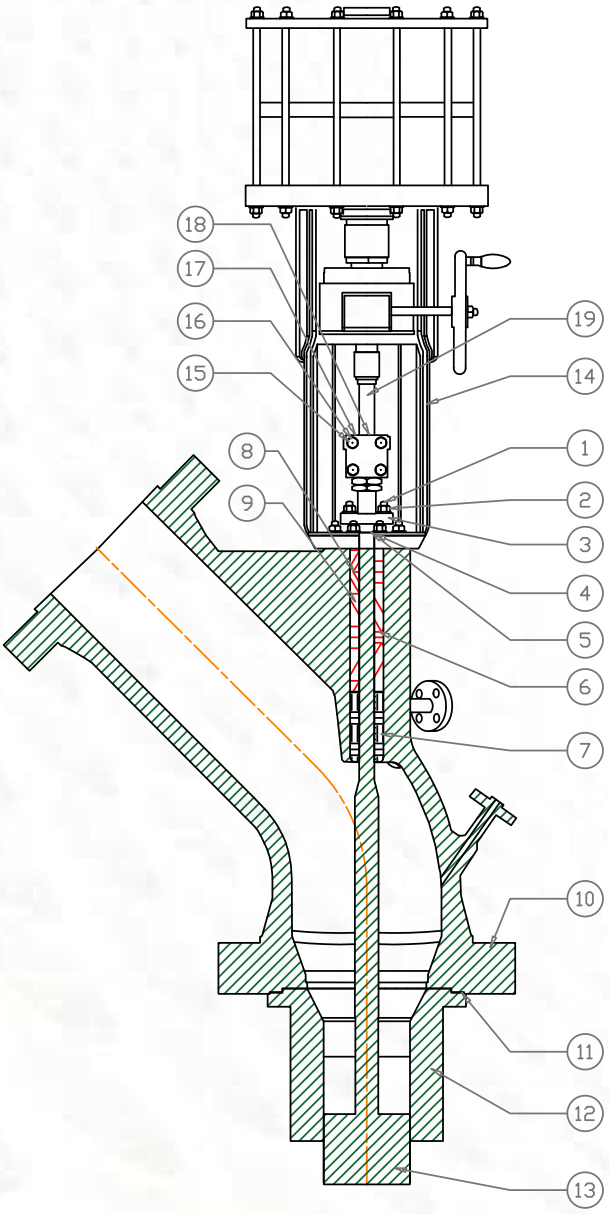
Specific Applications:

- Turbine bypass
- Process steam conditioning

Sever Service Control Valve

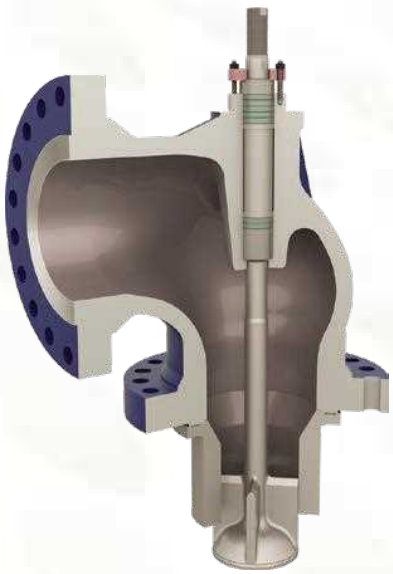
Tank Drain Control Valve TD Series

The GSSE TD Series is an erosive, flashing-resistant tank level control valve, designed with unique features for use in level control and tank drain applications with corrosive or viscous fluids prevalent in the PTA (Purified Terephthalic Acid) chemical industry. With High Pressure Drop, Sweep Angle Control Valve engineered Solutions for Corrosive and Erosive Severe Service Applications



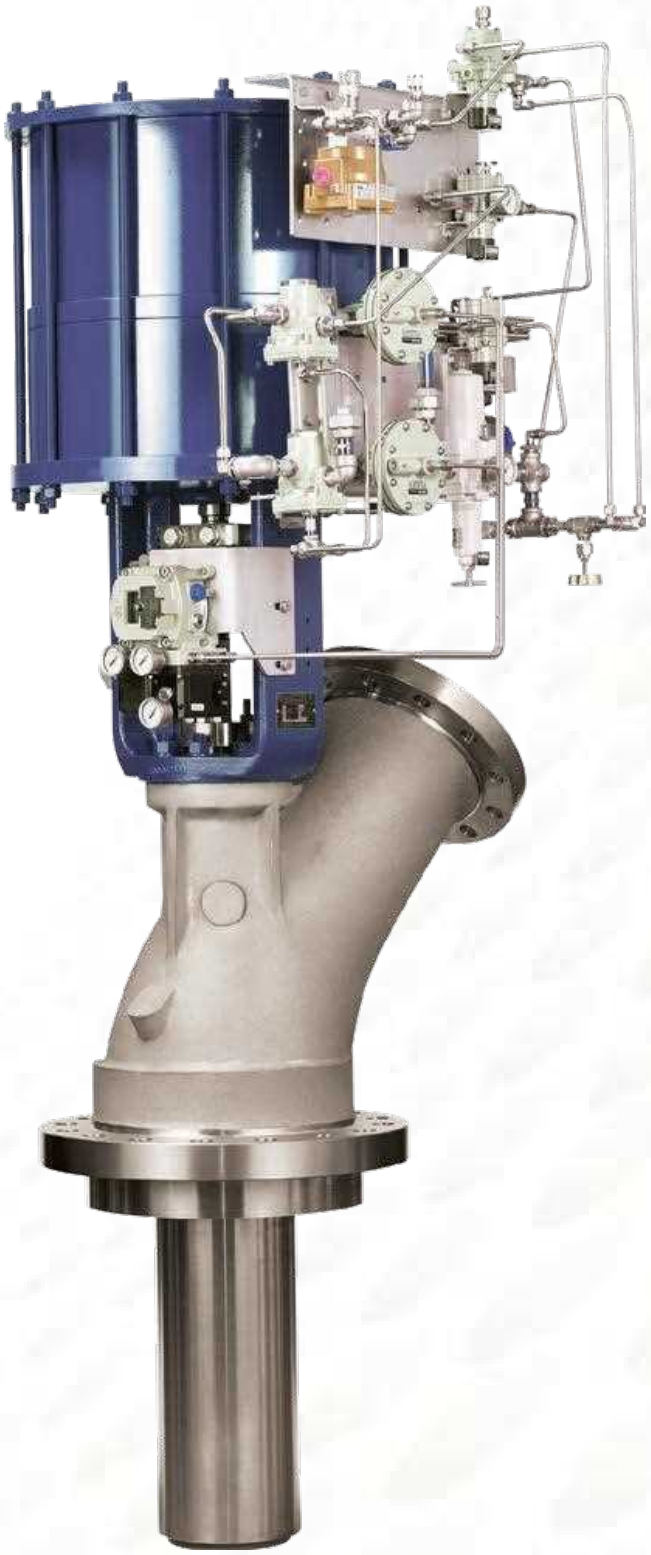
Item	Part Name
1	Packing Flange Stud
2	Packing Flange Stud Nut
3	Packing Flange
4	Packing Follower
5	Drive Nut
6	Packing
7	Guide Bushing
8	Lantern Ring
9	Lantern Ring
10	Body
11	Gasket
12	Seat Ring
13	Plug
14	Yoke
15	Stud
16	Nut
17	Indicator Arm
18	Split Clamp
19	Piston Rod

Also Available with 120° and 135° Configuration (135° Shown).



Specifications:

Flow Direction	
Contoured:	Flow-to-open/flow-to-close
Body	
Type:	Erosion resistance sweep angle
	90°, 120°, 135° sweep angle configurations
Bonnet	
Type:	Split body design, bottom entry trim access (No Separate Bonnet)
Body and Bonnet	
Materials:	316 Stainless Steel
	304 Stainless Steel
	Duplex Stainless Steel
	Titanium
	Hastelloy C
Trim	
Plug type:	Heavy Duty, Single Seat Plug
	1-piece Plug/Stem
	Guiding fins for vibration resistance
Seat ring:	Quick Change
	Single Seating Surface
Guide:	Heavy Top and Bottom Guided for increased stability and side loading
Cv ratio:	50:1
Flow characteristic:	Linear
Packing:	Wiper design for low friction throttling
Actuator	
Type:	Piston Cylinder (51/52/53)
Handwheel:	Optional Handwheel/Hand Jack
Additional Options	
	Flushing and purge ports to remove slurry



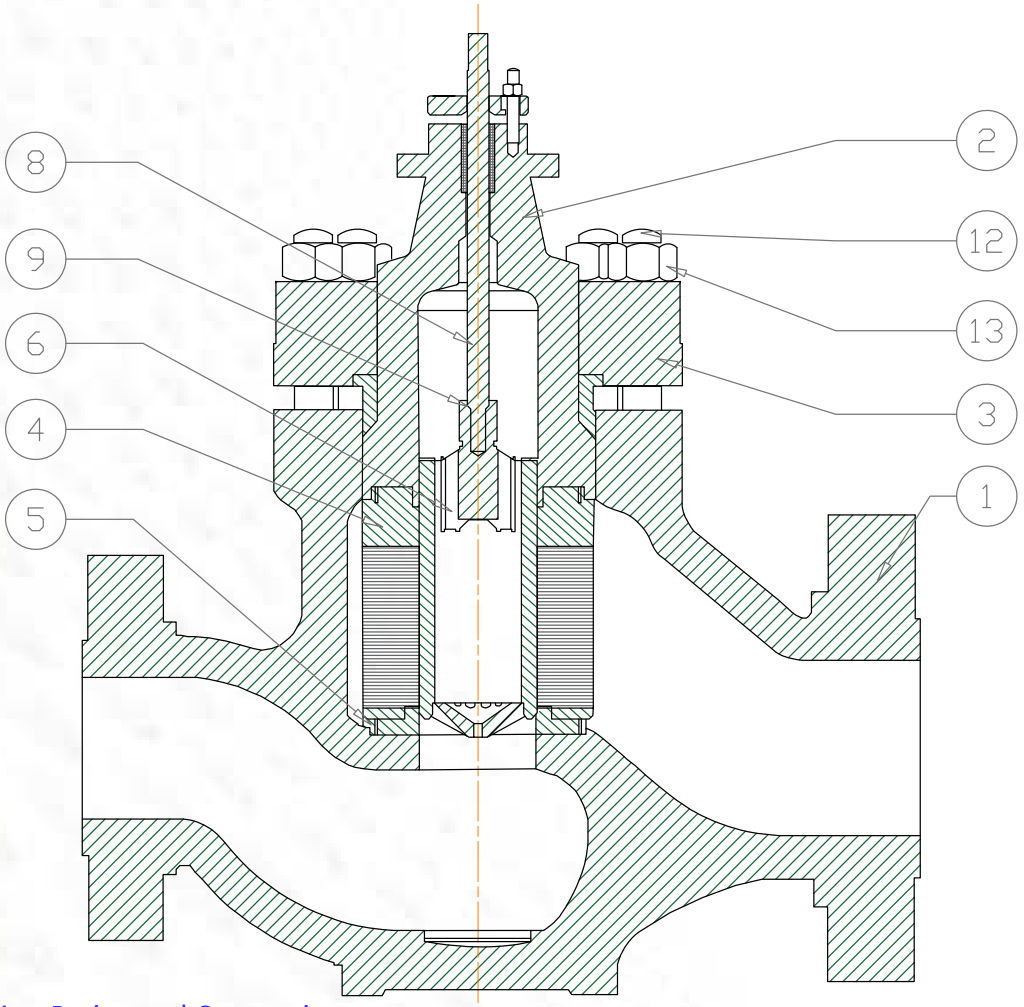
Typical Applications:

* Tank level control
* Pressure letdown applications common in reactor or crystallizer tanks.

Sever Service Control Valve

VL Series

The rugged cage guiding, optional pressure balancing and a host of custom engineered trim designs makes these valves suitable for higher pressure drops and other sever service applications, where conventionally designed control valves fail to perform satisfactorily.



ITEM	PART NAME
1	Body
2	Bonnet
3	Bonnet Flange
4	Cage (V-LOG Stack)
5	Seat Ring
6	Plug
7	Guide Bushing
8	Plug Stem
9	Plug Pin
• 10	Gasket
11	Metal Seal (Bridgeman)
12	Body Bonnet Stud
13	Nut

Size, Rating and Connection:

Flanged (RF,RTJ,T&G,FF) & Welded: 3”-30” , ANSI 150-2500

Body Materials:

Carbon Steel
Stainless Steel
Super-alloy

Actuators:

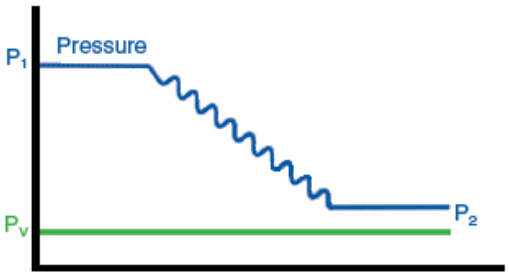
Model DS Spring Diaphragm
Model DM Multi Spring Diaphragm
Model PS & PD Cylinder

Trim:

Single Stage Lo-dB
Double Stage Lo-dB
Partial Stage
V-LOG

Characteristic:

Custom Characteristic
Linear



Energy Profile:

Energy Management Profile Trim

Higher Allowable Pressure Drops

VL series control valves provide exceptional and dependable performance over a wide range of pressure drops typical of severe services. Just as important, it handles a vast majority of all shut-off pressures with standard pneumatic spring-diaphragm actuators.

Greater Capacity With Low Recovery

Rated capacity for each VL series valve is at top levels established for contemporary cage guided valves.

These unusually high capacities are attained with minimum pressure recovery, as indicated by the high critical flow factors, which minimizes possibility of cavitation in liquid service.

Tight Shut-off

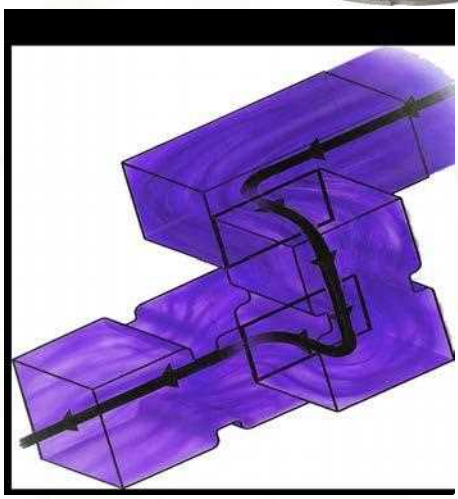
VL series valves can provide single-seat leak tightness of Class IV in accordance with ANSI/FCI 70.2, or the exceptional leak tightness of Class V.

Wide Temperature Range

Standard VL series valves handle temperatures from -30°C to 566°C. Standard bonnet is designed with a moderately finned extension, so no bonnet change is necessary in this temperature range. Optional bonnet design makes VL series control valves suitable for operations up to -196oC.

High Performance Material Is Standard

Without exception, the material specified as standard for VL series valves have been tested and selected to provide trouble free operation in services with high pressures and extreme temperatures. The superior trim material employed ensures durability of the valve for any severe application.



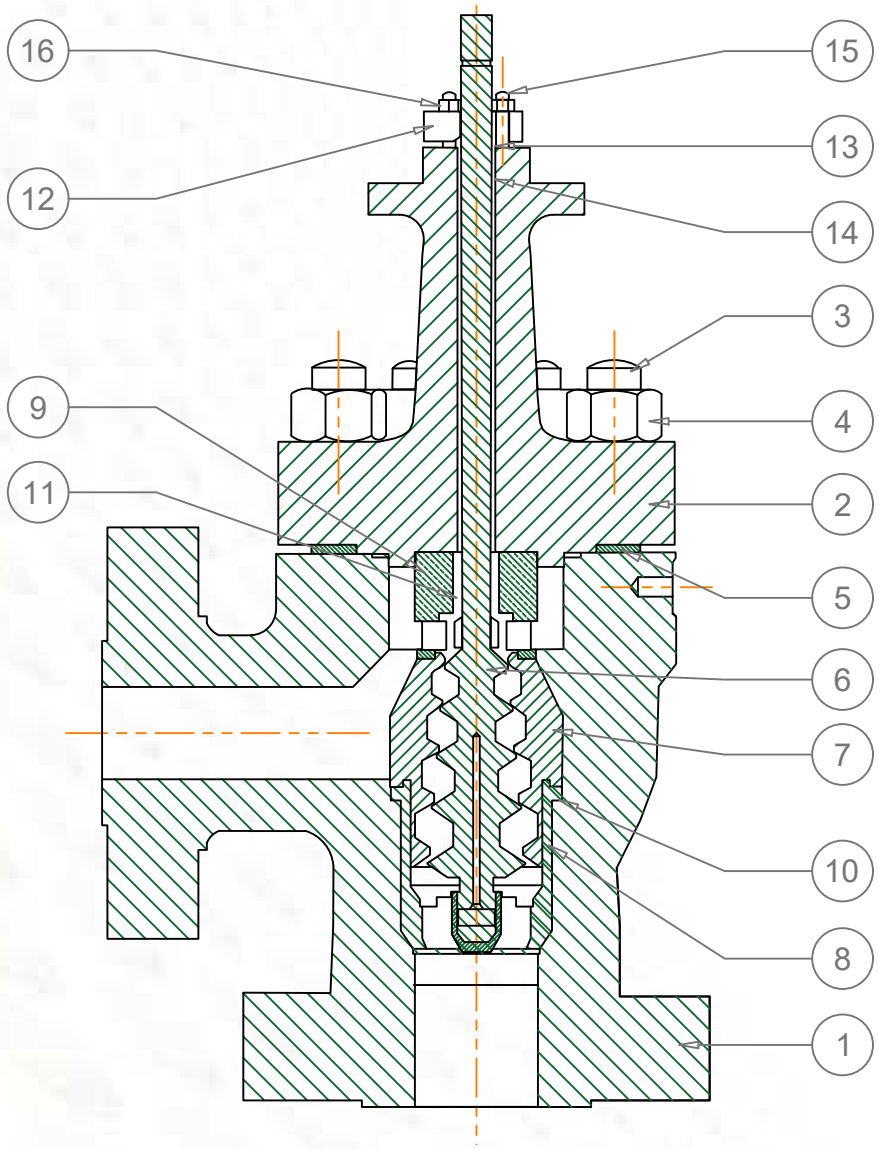
Specific Applications:

- Compressor Antisurge
- Flare to atmosphere

Sever Service Control Valve

High-Pressure Labyrinth Trim : HPL Series

These valves provide high pressure, compressible fluid control without the erosion, vibration and high noise associated with conventional control valves. Specially designed for Multiphase flow



Item	Part Name
1	Body
2	Bonnet
3	Body Stud
4	Body Nut
5	Body Gasket
6	Plug/Stem
7	Liner/Seat
8	Spider
9	Retainer
10	Trim Gasket
11	Stem Bushing
12	Packing Flange
13	Packing Follower
14	Packing Set
15	Packing Studs
16	Packing Nuts
*17	Actuator Bolts

*: Not Shown

Size, Rating and Connection:

Flanged (RF,RTJ) & Welded: 1”-8” , ANSI 600-2500, API 2K-10K

Body Materials:

Carbon Steel

Stainless Steel

Chrome-moly steel

High alloy steel

Actuators:

Model DS Spring Diaphragm

Model DM Multi Spring Diaphragm

Model PS & PD Cylinder

Trim:

Plug Type : 1-9 stage

Characteristic:

Modified Linear

Temperature Range:

-29 °C to 565 °C

Specifications:

Cavitation Elimination

The valve's multi-stage trim design reduces the pressure drop in small increments without allowing the local pressure at each stage to drop below the fluid vapor pressure, thus preventing cavitation. The actively controlled stages of the axial flow trim throttle in unison to avoid the adverse effects of an exaggerated reduction at any single stage.

Reliable Tight Shutoff

The standard seat design leakage rating meets IEC534-4 and ANSI/FCI 70.2 Class V shutoff requirements. The valve can also be supplied with block valve tight shutoff to comply with MSS-SP-61 specifications.

Debris Tolerance

Wide flow paths in the trim allow for passage of large particles entrained within the flow stream that would otherwise cause damage or loss of capacity. This ensures continuous and efficient operation by eliminating concerns of potential clogging due to debris in the flow stream. GSSE HPL series valve is a suitable design for many high-pressure, dirty service applications, including wellhead choke valves.

Expanding Area Trim Design

The circumference of each pressure reduction stage within the HPL series trim is designed to gradually increase as flow moves towards the downstream section. This expansion compensates for the change in gas density with the pressure and ensures a nearly constant fluid velocity throughout the complete throttling process, providing the valve with two advantages:

1. Reduction in noise produced by the fluid velocity
2. Considerable decrease in erosion of the plug and seat liner caused by particulate in the flow stream or fluid flashing.

For many applications that experience flashing service conditions, such as super critical power plant start-up valves or hot high-pressure separator letdown in refineries, the HPL series valve provides a low-velocity outlet area to minimize any effects of the phase transformation process. Similarly, for applications with entrained solids, such as gas wellhead choke applications, the valve reduces the velocity of the moving particulate to minimize wear and erosive damage to the trim and outlet flow area. Many designs include a larger outlet compared to the inlet size to retain the low velocity as the fluid exits the valve into the downstream piping. This arrangement eliminates the need for additional piping modifications, such as downstream reducers.

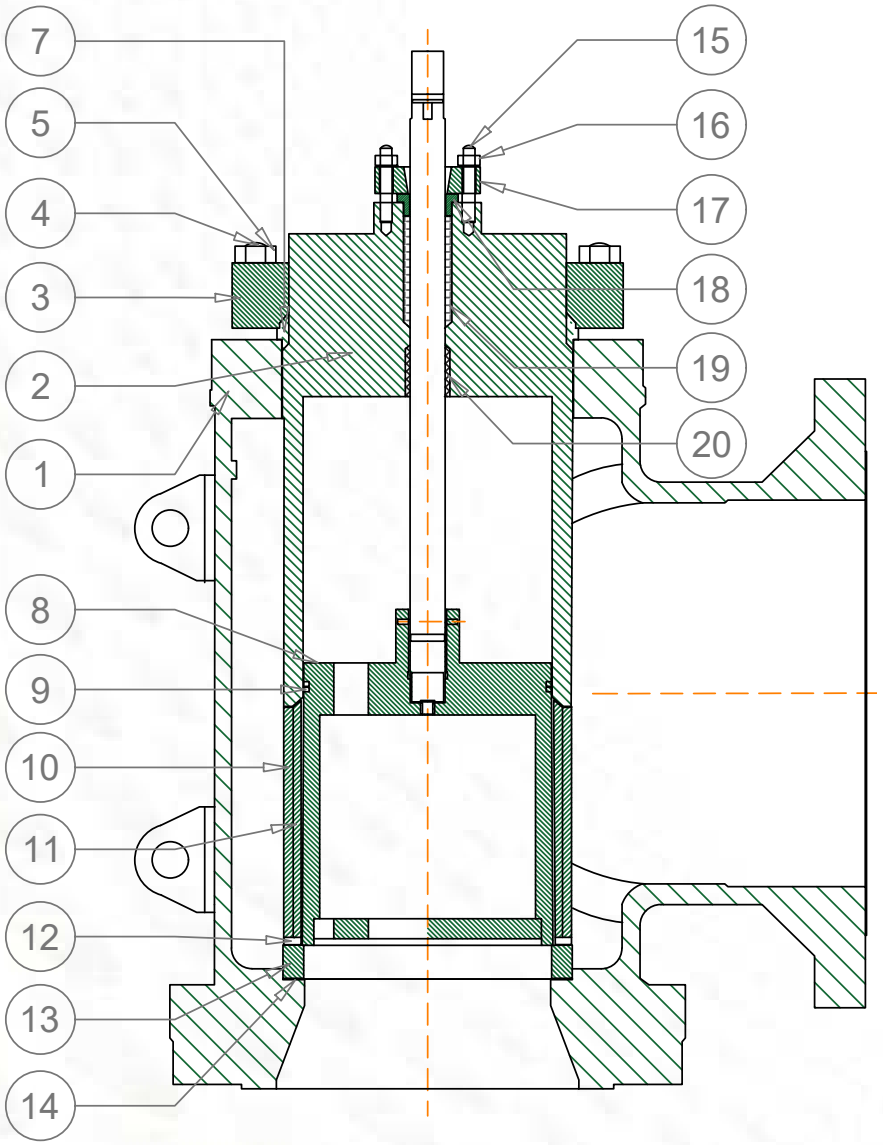
Specific Applications:

* High pressure compressible fluid or two-phase applications
* Erosion, vibration and high noise conditions
* high pressure, high temperature
* flashing hydrocarbon liquid services
* Hot High Pressure Separator control in Hydro processing applications
* Gas wellhead control in off-shore choke valves
* High pressure gas letdown with entrained debris

Sever Service Control Valve

Anti Surge Large Mass Flow : LMF

Specifically designed for applications with large mass flow rates and high differential pressures. Typical installations may be found in compressor surge control, gas to flare, atmospheric vent, or other applications where the ratio of inlet/outlet pressures require substantial levels of noise attenuation and large valve sizes. A variety of options and configurations are available to create effective solutions for our customers specific applications.



Item	Part Name
1	Body
2	Bonnet
3	Bonnet Flange
4	Body Stud
5	Body Nut
6	Metal Seal
7	Stem
8	Plug
9	Seal Ring
10	Cage (V-Log or Lo-dB)
11	Cage Retainer
12	Soft Seat Insert
13	Seat Ring
14	Conical Spring
15	Packing Flange Stud
16	16 Packing Flange Nut
17	Packing Flange
18	Packing Follower
19 *	Packing S/A
20	Guide Bushing

Size, Rating and Connection:

Inlet 4” – 30” , ASME CLASS 150-2500

Outlet 6” – 36”, ASME CLASS 150-600

ASME Flanged (RF, RTJ, API), Butt Weld

Body & Bonnet Material:

Carbon Steel, Low Temperature Carbon Steel, 316 Stainless Steel

Chrome Moly Steels

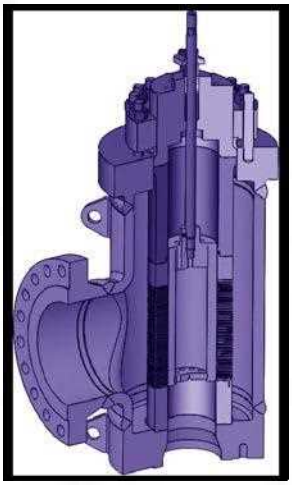
Trim

Plug : Balanced, Unbalanced, Auxiliary Pilot

Stack or Cage: Ported Cage, Single Stage Lo-dB, Double Stage Lo-dB

V-LOG Stack, Partial Stack

Seat Ring: Quick Change



Specifications:

Low Noise Trim

Our Best Fit approach allows for the widest range of noise attenuation options, providing the desired noise level at the lowest cost of ownership. These attenuation products range from single and double stage Lo-Db trim or up to as many as 40 stages of 3-dimensional V-LOG tortuous path trim. The selected trim option is always custom engineered to provide best results for each unique application.

Single and double stage Lo-dB trim is selected in most low to moderate pressure drop ratio applications. This technology is customized by modifying the size and spacing of each hole drilled into the cage to provide a minimal sound pressure level at the trim exit.

The 3-dimensional tortuous path design of GSSE's V-LOG trim controls pressure reduction through the management of the process fluid energy. This is accomplished by directing the gas through discrete flow channels that are designed with multiple stages consisting of 90-degree turns along with the intermediate contractions and expansions in the flow area. The enhanced flow geometry of the V-LOG trim creates a series of kinetic energy losses, followed by partial energy recoveries at each stage.

Large Pressure Drop – Energy Management

Process applications that require the LMF Series design often experience extremely high pressure drop ratios (P1/P2). These high ratios release large amounts of energy as the process fluid's pressure is reduced. This energy release can lead to excessive noise and vibration if not properly addressed in the valve design.

High Capacity

are met through a wide range of valve plug diameters, stroke lengths, and body gallery diameters to suit any application within standard product lead times.

Balanced Plug

Balanced plug designs deliver stability with smaller actuator thrust requirements, as compared to unbalanced designs. Normally, the LMF Series valves are installed in a flow-to-open configuration allowing radial expansion from the smaller diameter cage to the expanded area of the valve body. The free expansion of the fluid and precise separation of the trim exit flow jets, maximize trim noise attenuation and minimizes vibration within the valve body. For installations that require flow-to-close configurations, an auxiliary pilot plug may be supplied to reduce actuator thrust requirements.

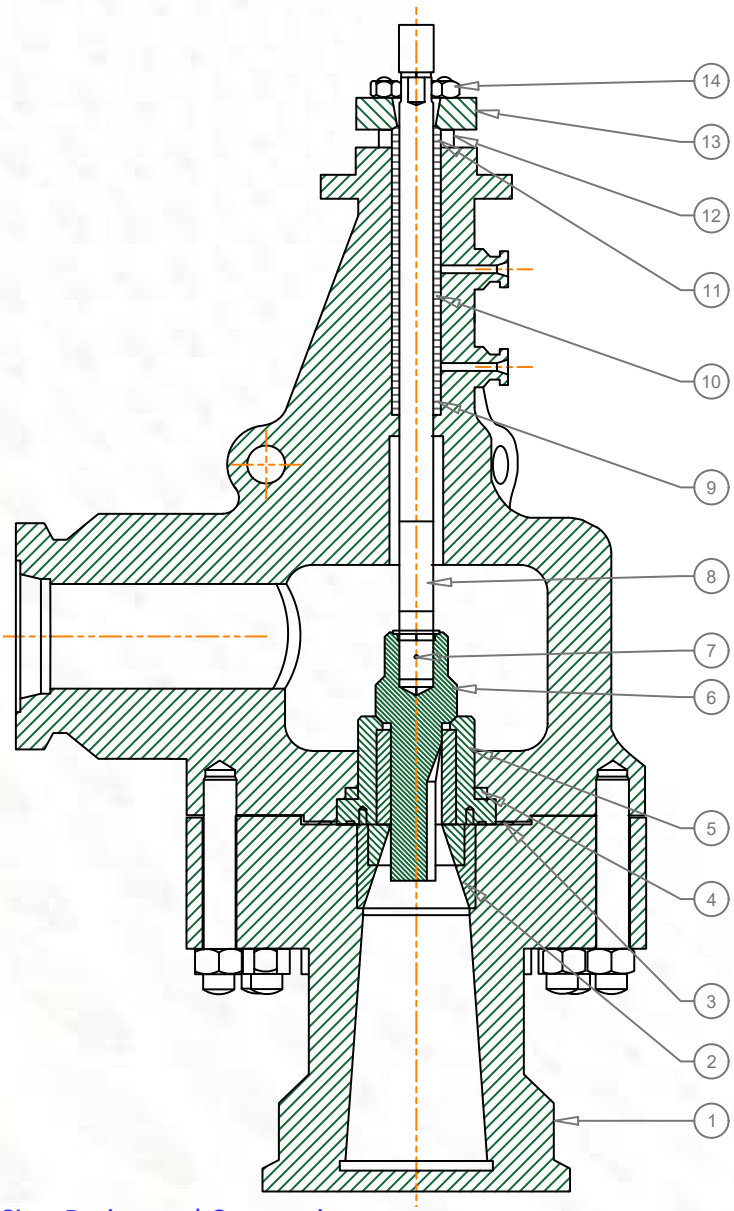
Typical Applications:

* Boiler feed water start-up and control
* Steam letdown
* Pump discharge
* Water reinjection
* Gas recycle and Vent Application
* Reactor Building
* Turbine Building,
* Reactor Facility Grounds & BOP
* Charge Gas Compression
* Pipeline Integrity, Operations
* Refrigeration, Liquefaction
* Loading/Shipping, Regasification
* Compression.

Sever Service Control Valve

Heavy Oil Erosion Resistant : HOV

Designed for special applications such as hydrocarbon service involving severe operating conditions where high temperatures and/or high pressures, high pressure drops, severe coking conditions, erosive fluid particles, and flashing liquids are encountered. They are particularly adapted to pressure or level control systems and emergency blowdown or dropout service.



Item	Part Name
1	Valve Body
2	Venturi Insert
3	Seat Ring Gasket
4	Body Gasket
5	Seat Ring Housing
6	Nozzle Plug
7	Plug Pin
8	Plug Stem
9	Packing
10	Lower Guid Bushing
11	Guid Bushing
12	Packing Follower
13	Packing Flange
14	Packing Nut

Size, Rating and Connection:

Flanged (RF,RTJ) & Hubs: 1”-12” , ANSI 600-2500

Body Materials:

347 Stainless Steel

Trim Materials:

Inconel 718, Ceramic & Tungsten Carbide

Actuators:

Model PS & PD Cylinder

Trim:

Plug Type : Bull Nose Top Guided & Fluted Top and Bottom Guided

Characteristic:

Modified Linear

Specifications:

High Performance

Materials

Materials of construction have been selected for high performance and long life.

Heavy Oil Valve

The GSSE HOV series control valve is designed to properly handle the difficult service associated with resid hydro processing of heavy oils. Such applications commonly include high temperatures, high pressures, erosive particulate and multi-phase flow. The HPL series is designed as the superior solution for these application difficulties.

Rugged Design

The HOV Series control valve is designed with rugged top guiding to resist vibration associated with high pressure letdown or multi-phase service. Designs featuring GSSE's axial flow fluted plug provide additional lower guiding for added stability and vibration resistance. High thrust and high stiffness actuation further extends service life in difficult applications.

Hardened Trim

The HOV Series is designed for severely erosive applications and thus requires specialty materials to provide high hardness on critical surfaces. Trim components include application-specific materials including tungsten carbide on moving components and ceramics on stationary components.

The inner body contours are streamlined to give maximum throat efficiency and freedom from erosion and to eliminate pockets causing flow reversal and eddy currents.

Provision is made for the introduction of a flushing medium which may be necessary when passing fluids containing solid particles, or to prevent coke formation in refinery service at extremely high temperatures.

The direct actuator is used air-to-push-down action and the reverse actuator for air-to-push-up action. Direct or reverse actuator can be used, depending on action desired.

Specific Applications:

* High Velocity Erosive Flow
* Residual Hydrocracking
* Heavy Oil Letdown
* 2-phase erosive service
* Resid hydro-cracking
* Service with entrained catalyst
* Service with Pressure drops up to 4000 psi
* Extremely Erosive Hydrocarbons

GSSE TYPES OF CONTROL VALVES

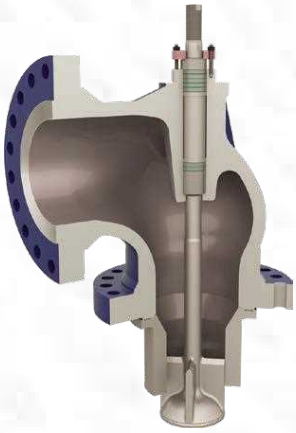
MF

TG

LG

DP

CG / VL

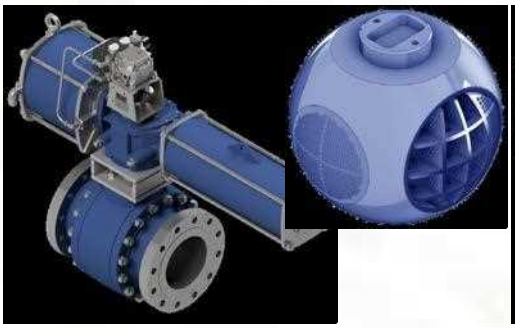


TD

HOV

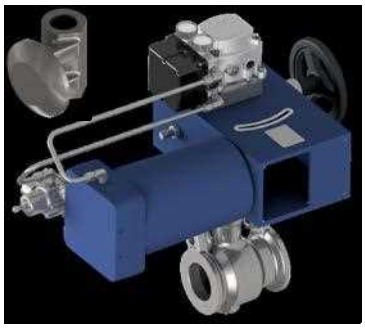
LMF

SF



NABA

SB



RG

BFT

BFD

3 WAY

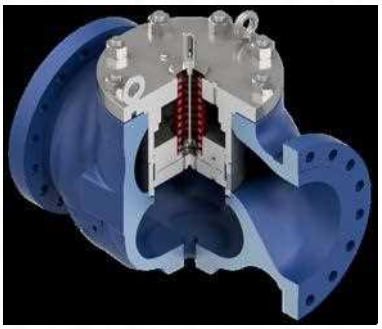
ARC VALVE

BLOW DOWN

GSSE SERIES	SIZE		PRESSURE RATING		END CONNECTION			TEMPERATURE RATING		DESIGN	SERVICE		Cv RANGE	Remarks	Application
	In		Lbs		FLG	RTJ	BW	°C			GENERAL	SEVERE			
TG	1/2	8	150	2500	*	*	*	-29	427	TOP GUIDED	*		0.1-640		All Purpose
CG	2	24	150	2500	*	*	*	-196	566	CAGE GUIDED	*	*	16-8000		All Purpose
LG	1	8	300	2500	*	*	*	-29	316	AXIAL FLOW	*	*	1-141.5	1	Min flow-Max DP
MF	1/2	1	150	2500	*	*	*	-196	343	AXIAL FLOW	*		0.0016-3.8		Mirco flow
DP	2	12	150	1500	*	*	*	-29	427	STEM GUIDED	*		8-2560		High Cv
RG	1	12	150	600	*	*	*	-196	400	ECCENTRIC PLUG	*	*	0.5-1750	3	Densed fluid
SB	1	12	150	300	*	*	*	-29	316	SEGMENTED BALL	*	*	55-4400		Densed fluid
NABA	2	56	150	2500	*	*	*	-60	176	MULTI STAGE BALL	*	*	260-249000		Super High Cv
BF T	2	48	150	1500				-196	427	TRIPLE OFFSET	*	*	10-74210		High Temp. High Pre
BF D	2	64	150	600	*	*	*	-10	200	DOUBLE OFFSET	*	*			High Performance
SF	1	48	150	4500	*	*	*		648	CAGE GUIDED		*	5800		Desuperheater
HPL	1	8	600	4500	*	*	*	-29	565	AXIAL FLOW		*	15-200	1, 2	Min flow-Max DP
HOV	1	12	600	2500	*	*	*	-29	480	STEM GUIDED		*	7-530		High Cv
LMF	4	30	150	2500	*	*	*	-196	594	STACK TRIM		*	110-13500	1	Anti Surge
TD	1	16	150	1500	*	*		-29	360	STEM GUIDED		*	3.5-2500		Tankk Drain
VL	3	30	150	2500	*	*	*	-30	566	VARIABLE STACK					Anti Surge
BLOW DOWN	1	3	300	2500	*	*	*			STELLITE TRIM					Boiler
ARC VALVE	1.5	12	150	2500	*	*	*								Boiler

1 AVAILABLE FOR API 2000-10000
2 AVAILABLE WITH HUB CONNECTION
3 AVAILABLE WITH FLANGELESS BODY

GSSE TYPES OF PRESSURE REGULATOR AND BACK PRESSURE VALVES



ZN98-TGC

EF90

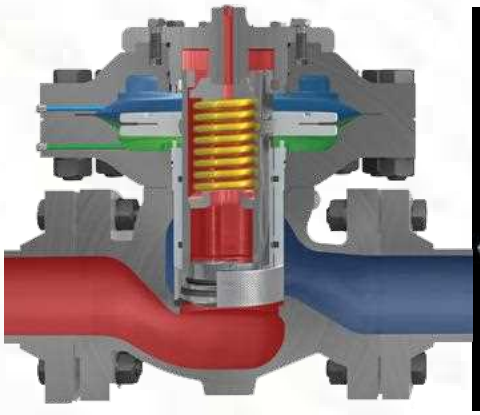
ZF90

ME05R

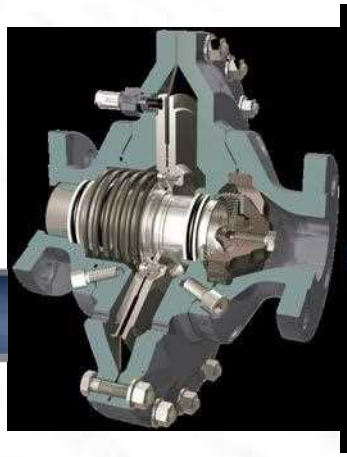
N2B

N2S

DE0A



E2H



T5L

ZN98-ZN TGC

MN5R

N9

Y-Z93

Z30

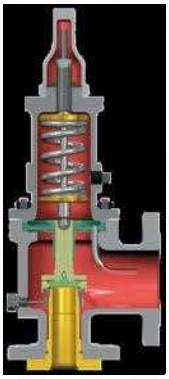
PRESSURE REGULATOR VALVES

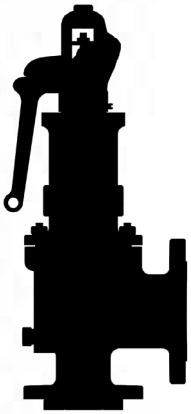
Outlet Pressure Range psig / barg	Air	Steam	Tank Blanketing	Liquid	Process Gas	Fuel Gas	Model	Operation Method	Body Size, NPS	MAXIMUM INLET PRESSURE, psig / barg
2 to 400 / 0.14 to 27.6	●	●		●	●	●	MN5R	Direct	¼ to 2	1000 / 68.9
1in. w.c. to 7 / 2 mbar to 0.48	●		●		●	●	TZ05	Direct	¾ and 1	200 / 13.8
3 to 500 psig / 0.21 to 34.5 bar	●				●	●	Z30	Direct	1 and 2	1500 / 103
5 to 300 / 0.34 to 20.7	●			●	●	●	ME05R	Direct	1, 2, 3 and 4	400 / 27.6
0.25 in. wc to 7 / 0.6 mbar to 0.48	●		●		●		EF90	Pilot	1 to 12	400 / 27.6
4 in. w.c. to 300 / 10 mbar to 20.7	●		●	●	●	●	ZN98-TGC	Pilot	1 to 12	400 / 27.6
14.5 to 1160 / 1 to 80	●				●	●	E2H	Pilot	1,2,3,4,6,8 and 12x6	1,500 / 103
0.5 in wc to 7 psig/1mbar to 0.48	●				●	●	T5L	Pilot	1, 2, 3, 4, 6, 8 and 10	1480 / 102
2 to 250 / 0.14 to 17.2		●					N2B	Pilot	1, 1-1/2, 2, 3 and 4	42,400 lbs/h /19,234 kg/h
2 to 250 / 0.14 to 17.2		●					N2S	Pilot	1" to 6 x 4	300 / 20.7
10 to 700 / 0.69 to 48.3	●				●	●	DE0A	Pilot	1" to 4X6	1500 / 103
0 to 150 / 0 to 10.3	●				●	●	S7D	Direct	1/2	20,900 / 560
2 in. w.c. to 100 / 5 mbar to 6.9	●		●		●	●	N9	Pilot	2	1000 / 69.0

BACK PRESSURE REGULATOR AND RELIEF VALVES

Control Pressure Range psig / barg	Air	Steam	Tank Blanketing	Liquid	Process Gas	Fuel Gas	Model	Operation Method	Body Size, NPS	MAXIMUM INLET PRESSURE, psig / barg
2 to 375 / 0.14 to 25.9	●	●		●	●	●	MN8R	Direct	¼ to 2	400 / 27.6
2in. w.c. to 7 / 5 mbar to 0.48	●		●		●		TZ08	Direct	¾ and 1	75 / 5.2
3 to 250 / 0.21 to 17.2	●				●	●	Z30R	Direct	1 and 2	550 / 37.9
5 to 300 / 0.34 to 20.7	●			●	●	●	ME08R	Direct	1, 2, 3 and 4	400 / 27.6
0.5 in. w.c. to 7 / 1 mbar to 0.48	●		●		●		ZF90	Pilot	1 to 12	12.5 / 0.86
0.5 in. w.c. to 7 / 1 mbar to 0.48	●				●	●	ZN98-TGC-Z3EG	Pilot	1 to 6 and 8 x 6	8,795,000 /235,706
14.5 to 1160 / 1.0 to 80.0	●				●	●	E2HR	Pilot	1 to 4	13,833,000 /370,724
29 to 609 / 2 to 42	●				●	●	T5LR	Pilot	1, 2, 3, 4, 6, 8 and 10	74,442 / 1,995

GSSE TYPES OF PRESSURE RELIEF, SAFETY AND PRESSURE VACUUM VALVE

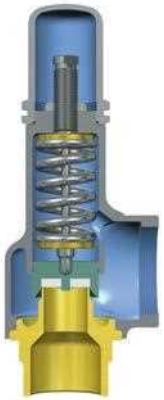

EN00

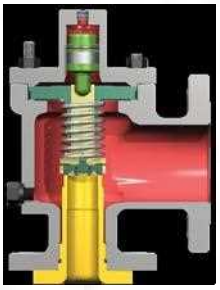

EN00-P


EN00-UM


EN000


EN82


ZV82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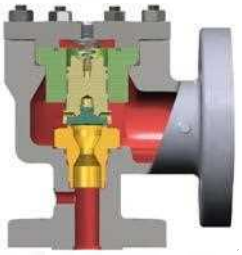
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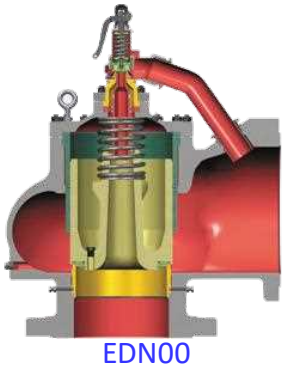
VN00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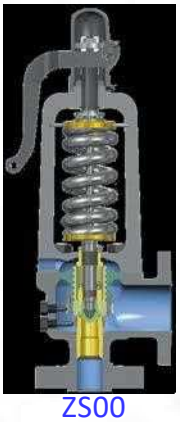
ES00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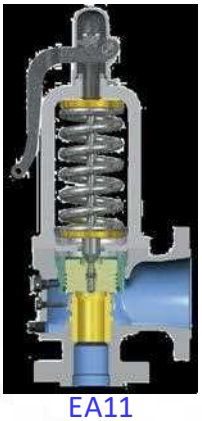
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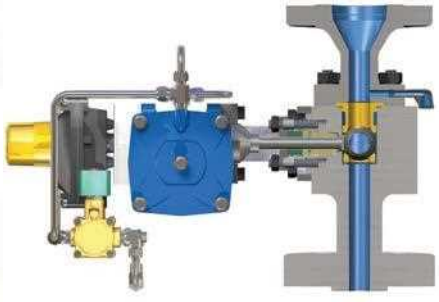
EF11


EF41-3


ZN00-40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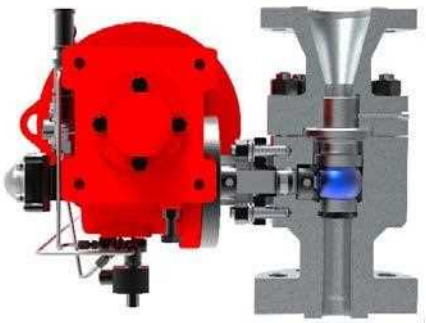
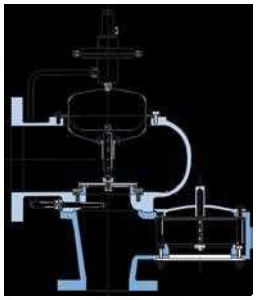

DF00-B


VN20


VN10


VN20-A



GSSE MODLE SERIES	CONSTRUCTION			INLET SIZE		INLET RATING		OUTLET SIZE		OUTLET RATING		ORIFICE SIZES		SET PRESSURE RANGE		TEMPERATURE RANGE		ASME SEC I	ASME SECVIII
	CONVENTIONAL	BELLOWS	PILOT	In		Psi		In		Psi				Psi		°C			
EN00	□	□		1	12	150	2500	2	16	150	300	D	W	4	6250	-268	815	*	*
EN00-UM	□	□		1	12	150	2500	2	16	150	300	D	W	4	6250	-268	815	*	*
EN000	□	□		0.5	2	150	2500			150	300	0.096	0.567	5	8000	-254	593		*
EN82				0.2	2	THREADED		THREADED		THREADED		0.121	1.399	10	500	-29	427		*
ZV82				0.5	2.5	THREADED		THREADED		THREADED		D	J	15	300	-198	208		
ZN00				1	12	150	2500	2	16	150	300	D	W	15	6250	-40	263		*
DN00			□	1	12	150	2500	2	16	150	300	D	T	15	6250	-40	263		*
VN00			□	1	8	150	2500	2	10	150	300	D	T	15	7200	-40	263		*
ED900	□		□	16	20	300		18	24			114	201	50	300	121	288		*
EZ00			□	1.5	8	600	4500	3	10	150	300	-1	Q	100	1600		565	*	*
ZS00				1.5	6	600	1500	3	8	150	300	-1	Q	100	1600		565	*	*
EA11				1.25	6	300	600	1.5	8	150	300	-F	Q	15	725		538	*	*
EF11				1.5	6	250		2.5	4	125		-H	Q	15	250	-29	215	*	*
EF41-3				0.5	2.5	THREADED		0.75	2.5	THREADED		D	J	15	350	-29	215	*	*
EN00/P				1	8	150	2500	2	10	150	300	D	T	5	6000	-29	454	*	*
ZN00-40			□	1	12	150	2500	2	16	150	300	D	W	15	5800	-40	263		
DF00-5				1.5	4	150	4500	3	6	300	900	0.875	3	50	6000		621		

PRESSURE VACUUM RELIEF VALVE PVRV

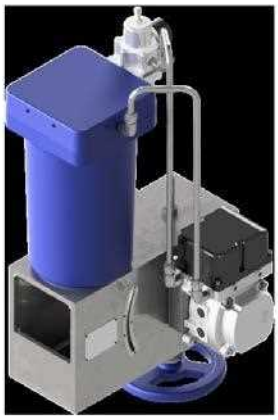
MODLE	CONSTRUCTION			PRESSURE SETTING		VACUUM SETTING	
	WEIGHT	SPRING	PILOT				
VN20	*	*		100 mbarg	1 barg	-100 mbarg	-1 barg
VN20-A			*	100 mbarg	1 barg	-100 mbarg	-1 barg
VN10	*	*		100 mbarg	4 barg	-100 mbarg	-4 barg

GSSE TYPES OF ACTUATORS AND INSTRUMENTS

DM

PS

ELH



RG

QT

RP

SY

EGA

Digital Smart Hart and FF Positioner

Volume Booster

P to P VS00 Positioner

Air Set

GSSE SERIES	DESIGN		FRAME SIZE	MAX. OPERATING PRESSURE	TRAVEL RANGE	OPERATING ENERGY		
	LINEAR	ROTARY		PSI		PENUMATIC	HYDRAULIC	ELECTRIC
DM	*		6, 10, 16, 23	60	0.8-2.5 INCH	*		
PS	*		6, 8, 12, 16, 20	150	2.5-12 INCH	*		
PSH	*		1	3000	12 INCH		*	
ELH-L	*		1 1	2250	20 INCH			*
ELH-Q		*	1	2250	90 DEG			*
QT		*	8, 10, 18	60	90 DEG	*		
RD		*	41/2, 6, 7, 9	60	90 DEG	*		
RP		*	8 SIZES	100	90 DEG	*		
PQ		*	9 SIZES	100	90 DEG	*		
SY		*	9 SIZES	100	90 DEG	*		
SYH		*	9 SIZES	1500	90 DEG		*	
EGA	*	*	11 SIZES		MULTI TURN			*

VS 00 P to P fully stainless steel positioner suitable for direct sour gas application

Digital Smart Hart and Foundation Field Bus Electero Punematic Positioner

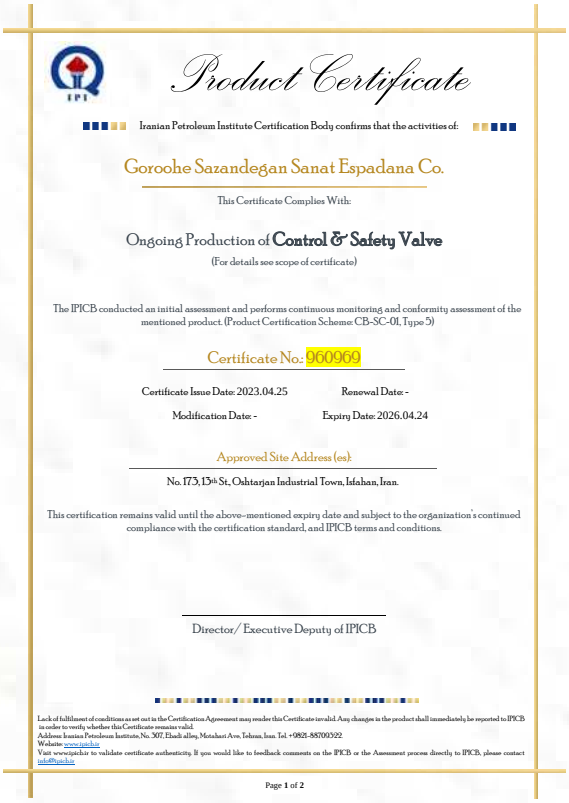
Voulme Booster for fast Stroking Applications

High and Low Cv Air set for different Applications

Applicable International Standards (Design and Material)

API (6A, 6D, 600, 602, 599)
ASME (B16.34, B16.5, B16.10, 16.25, 16.47)
IPS (E-IN-160, C-IN-160, G-IN-160 , M-IN-160)
BS (1873, 5353, 12516, 2080, 5351, 1414, 1868)
NACE (MR0175)
ATEX
PED
Other Material and Special Design Applicable On Request.

Certificates



Product Certificate

Iranian Petroleum Institute Certification Body confirms that the activities of:

Goroohe Sazandegan Sanat Espadana Co.

This Certificate Complies With:

Ongoing Production of **Control & Safety Valve**

(For details see scope of certificate)

The IPICB conducted an initial assessment and performs continuous monitoring and conformity assessment of the mentioned product. (Product Certification Scheme: CB-SC-01, Type 5)

Certificate No.: 960969

Certificate Issue Date: 2023.04.25 Renewal Date: -

Modification Date: - Expiry Date: 2026.04.24

Approved Site Address (es):

No. 173, 13th St., Oshtarjan Industrial Town, Isfahan, Iran.

This certification remains valid until the above-mentioned expiry date and subject to the organization's continued compliance with the certification standard, and IPICB terms and conditions.

Director/ Executive Deputy of IPICB

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid. Any changes in the product shall immediately be reported to IPICB in order to verify whether this Certificate remains valid.
Address: Iranian Petroleum Institute, No. 307, Ebadi alley, Motahari Ave, Tehran, Iran. Tel: +9821-88700322
Website: www.ipicb.ir
Visit www.ipicb.ir to validate certificate authenticity. If you would like to feedback comments on the IPICB or the Assessment process directly to IPICB, please contact info@ipicb.ir.

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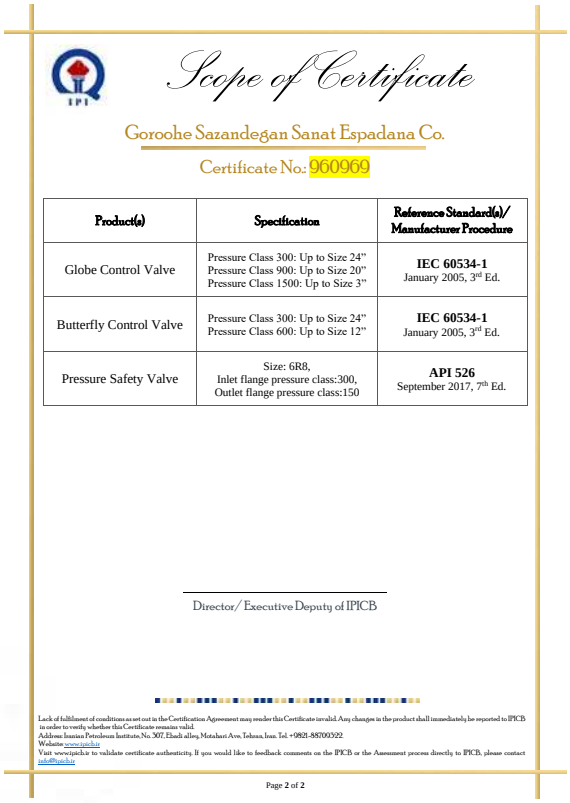

Scope of Certificate

Goroohe Sazandegan Sanat Espadana Co.

Certificate No.: 960969

Product(s)	Specification	Reference Standard(s)/ Manufacturer Procedure
Globe Control Valve	Pressure Class 300: Up to Size 24" Pressure Class 900: Up to Size 20" Pressure Class 1500: Up to Size 3"	**IEC 60534-1** January 2005, 3rd Ed.
Butterfly Control Valve	Pressure Class 300: Up to Size 24" Pressure Class 600: Up to Size 12"	**IEC 60534-1** January 2005, 3rd Ed.
Pressure Safety Valve	Size: 6R8, Inlet flange pressure class:300, Outlet flange pressure class:150	**API 526** September 2017, 7th Ed.

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Certificate of Registration

MOODY INTERNATIONAL

Goroohe Sazandegan Sanat Espadana (GSSE).

ISO 9001:2015

Certificate of Registration

MOODY INTERNATIONAL

Goroohe Sazandegan Sanat Espadana (GSSE).

ISO/TS 29001:2020

Certificate of Registration

MOODY INTERNATIONAL

Goroohe Sazandegan Sanat Espadana (GSSE).

HSE Management System

CONTROL VALVE
PRESSURE REGULATOR
BACK PRESSURE VALVE
TANK BLANKETING
PRESSURE RELIEF VALVE
ACTUATORS

Iranian Knowledge Based Enterprise

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Industrial Town, Zobe Ahan
Freeway, Esfshan - IRAN

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