

GSSE

PRESSURE SAFETY AND RELIEF VALVE GENERAL CATALOUGE

MADE IN IRAN



**TOTAL SOLUTION FOR YOUR
PROCESS REQUIREMENTS**



GSSE

is a known design and Power plant engineering team design and simulate international standards API, ASME, and IGS. We use latest software for and manufacturing of our products of valve including:

- Control Valves (Globe, Ball, Butterfly)
- Pressure Safety Valves (Conventional)
- Pressure Regulator Valve (Backflow Preventing Regulator Valve & Tank)
- On-Off Valve (Ball valves, Orbital)

Our products have been in service in oil and gas plants and other industries for many years. GSSE fully modernized CNC machining equipment enable us to offer best service. Our CAD-CAM Online network from our design shop help us to make our job in

Knowledge enterprise company active in de-
manufacturing of valves for Oil and Gas,
plant 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
cs. GSSE is manufacturing various types

terfly)

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.

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n the shortest time.



Contents	Page
Quality	6
Markets	6
Design Research and Development	6
FEA Simulation	6
Casting Simulation	6
CFD Simulation	7
Control Valve	8
Sizing And Selection	8
Hard Facing	9
Production Facilities	10
Testing & Quality Control	11
About safety valves	12
Safety Valve Applicable Standards	13
Types of GSSE Pressure Safety and Relief Valves	14
GSSE Safety Relief Valve EN 00	15
GSSE Safety Relief Valve EN 00 - UM	16
GSSE Safety Relief Valve EN 000	17
GSSE Safety Relief Valve EN82 , ZV82	18
GSSE Pilot-Operated Safety Relief Valves ZN00 , DN00	19
GSSE Pilot-Operated Safety Relief Valves VN00 , ED900	20
GSSE Boiler Safety Valves EA11, EF11	22
GSSE Boiler Safety Valves EF41, EF43 , DF00-5	23
GSSE Boiler Safety Valves EN00/P, ZN00-40	24
GSSE Boiler Safety Relief Valves ES00, ZS00	25
Gsse types of control valves	26
Gsse types of pressure regulator and back pressure valves	28
Gsse types of pressure relief, safety and pressure vacuum valve	30
Gsse types of actuators and instruments	32
Applicable International Standards (Design and Material)	34
Certificates	34

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.

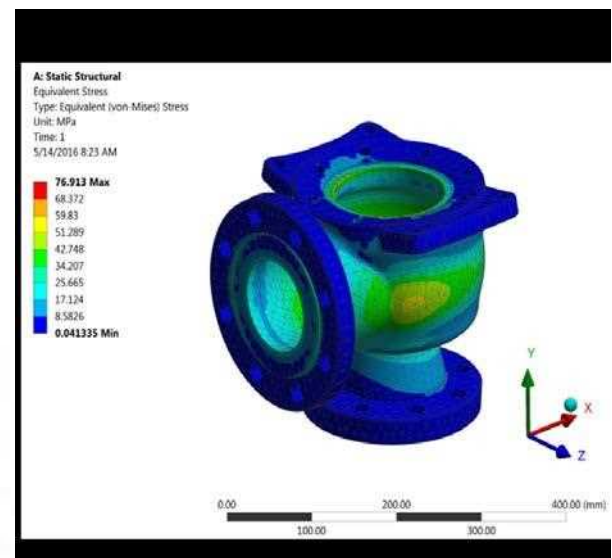
We provide spare parts to support our customers.

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.

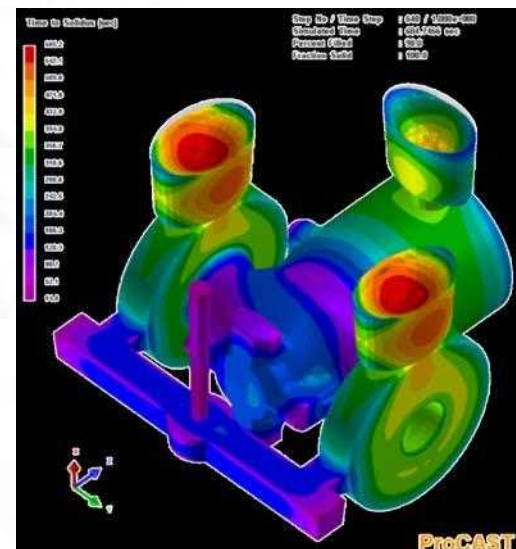
FEA Simulation

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.

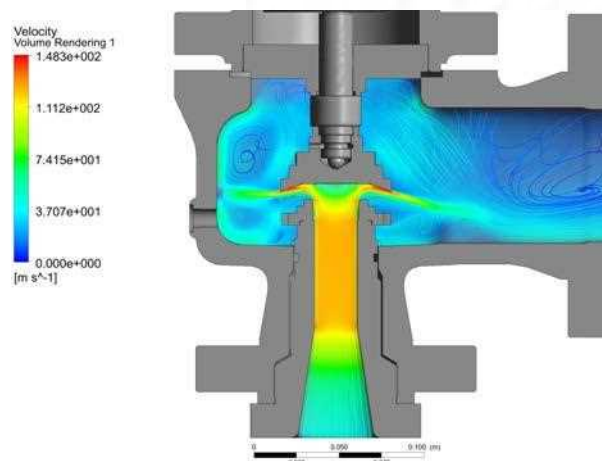


CFD Simulation

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.

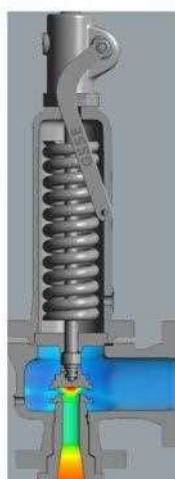
To overcome these limitations and problems we have done a thorough numerical and experimental analysis of control valves. The main influential geometry parameters of the control valve are defined for numerical analyses. In the next step the basic theory of the numerical simulation, including the 3D modeling, 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 is 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 up 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 an 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 stocking forged raw materials in different grades from Carbon 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:



About safety valves

Safety Valve is a one type of valve that automatically actuates when the pressure of inlet side of the Valve increases to a predetermined pressure, to open the valve disc and discharge the fluid (steam or gas) ; and when the pressure decreases to the prescribed value, to close the valve disc again. Safety valve is so-called a final safety device which controls the pressure and discharges certain amount of fluid by itself without any electric power support. Safety Valve is mainly installed in a chemical plant, electric power boiler, gas storage tank, preventing the pressure vessels from exploding or damaging.

The pressure Relief Valve must open at a predetermined set pressure, flow a rated capacity at a specified overpressure, and close when the system pressure has returned to a safe level. Pressure Relief Valves must be designed with materials compatible with many process fluids from simple air and water to the most corrosive media. They must also be designed to operate in a consistently smooth and stable manner on a variety of fluids and fluid phases.

The basic spring loaded pressure Relief Valve has been developed to meet the need for a simple, reliable, system actuated device to provide overpressure protection.

The Valve consists of a Valve inlet or nozzle mounted on the pressurized system, a disc held against the nozzle to prevent flow under normal system operating conditions, a spring to hold the disc closed, and a body/ Bonnet to contain the operating elements. The spring load is adjustable to vary the pressure at which the Valve will open.

When a pressure Relief Valve begins to lift, the spring force increases. Thus system pressure must increase if lift is to continue. For this reason pressure Relief Valves are allowed an overpressure allowance to reach full lift. This allowable overpressure is generally 10% for Valves on unfired systems. This margin is relatively small and some means must be provided to assist in the lift effort.

Most pressure Relief Valves, therefore, have a secondary control chamber or huddling chamber to enhance lift. As the disc begins to lift, fluid enters the control chamber exposing a larger area of the disc to system pressure.

This causes an incremental change in force which overcompensates for the increase in spring force and causes the Valve to open at a rapid rate. At the same time, the direction of the fluid flow is reversed and the momentum effect resulting from the change in flow direction further enhances lift. These effects combine to allow the Valve to achieve maximum lift and maximum flow within the allowable overpressure limits. Because of the larger disc area exposed to system pressure after the Valve achieves lift, the Valve will not close until system pressure has been reduced to some level below the set pressure. The design of the control chamber determines where the closing point will occur. The difference between the set pressure and the closing point pressure is called blowdown and is usually expressed as a percentage of set pressure. When superimposed back pressure is variable, a balanced bellows or balanced piston design is recommended. A typical balanced bellow is shown on the right. The bellows or piston is designed with an effective pressure area equal to the seat area of the disc. The Bonnet is vented to ensure that the pressure area of the bellows or piston will always be exposed to atmospheric pressure and to provide a telltale sign should the bellows or piston begin to leak. Variations in back pressure, therefore, will have no effect on set pressure. Back pressure may, however, affect flow.

Safety Valve Applicable Standards

ASME SEC I	Boiler applications
ASME SEC VIII	Unfired Pressure Vessel Applications
ANSI / ASME PTC 25.3	Safety and Relief Valves - performance test codes
API RP 520	Sizing selection and installation of pressure relieving devices in refineries, Part 1 Design, Part 2 Installation
API RP 521	Guide for pressure relieving and depressurizing systems
API STD 526	Flanged steel pressure relief valves
API STD 527	Seat tightness of pressure relief valves

Causes of overpressure

There are a number of reasons why the pressure in a vessel or system can exceed a predetermined limit. API Standard 521/ISO 23251 Sect. 4 provides a detailed guideline about causes of overpressure. The most common are:

- * Blocked discharge
- * Fire case
- * Thermal expansion
- * Runaway reaction
- * Tube rupture in heat exchangers

Applications:

Chemical and petrochemical

Refinery

Power generation

Economizer (Water)

Liquid Phase Thermal Fluid Heaters

Commercial

MSR – Moisture Steam Re-heater

Turbine gland steam seal

Pegging steam/auxiliary steam

De-aerators

Feed-water heaters – tube side and shell side

Pumps – recirculation line protection

Fuel oil pumps

Ammonia systems

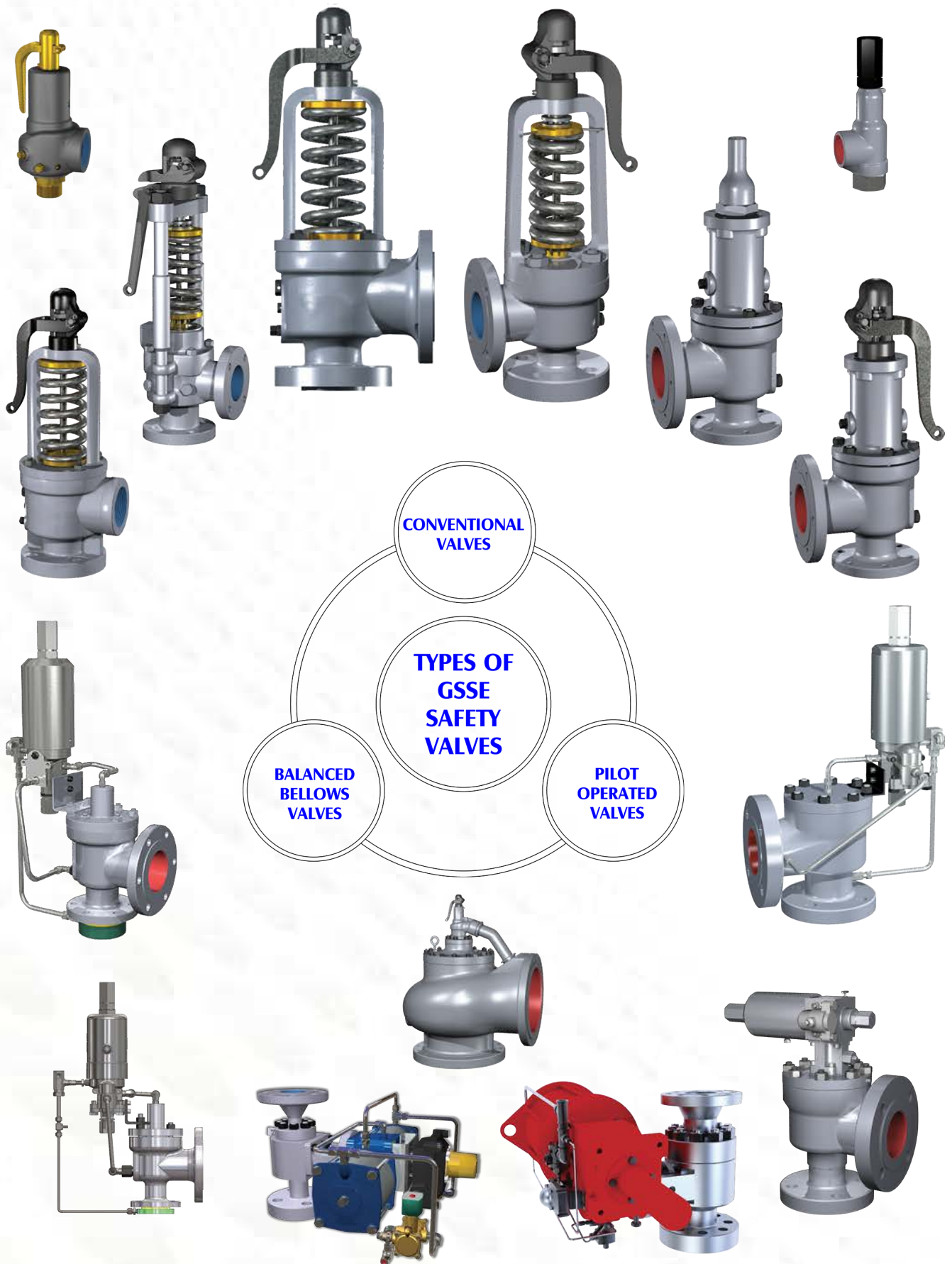
Scrubber systems

Air compressor

Miscellaneous pumps

Trim supplied to match the fluid

Types of GSSE Pressure Safety and Relief Valves



EN00/EN00 DM Series Safety Relief Valve	
The highly adaptable GSSE EN00 Series safety relief valve can meet numerous application requirements.	
Inlet Sizes:	1" through 12"
Inlet Ratings:	ASME Class 150 through 2500 EN 1092-1 PN 10 through PN 400
Outlet Sizes:	2" through 16"
Outlet Ratings:	ASME Class 150 and 300 EN 1092-1 PN 10 through PN 40
Orifice Sizes:	17 sizes - D through W
Set Pressure Range:	4 to 6250 psig (0.27 to 431 barg)
Temperature Range:	-450°F to 1500°F (-268°C to 815°C)
Materials:	Cast carbon steel body with stainless steel trim
Based On:	ASME B&PVC Section I (Liquid), Section III & VIII API 520, 521 and 526 NACE



Options for EN 00 Series Safety Relief Valve

EN 00-30

The EN 00-30 Series valve includes the addition of a balanced bellows that is necessary to compensate for the effects of variable back pressure. By isolating the upper structure and allowing the use of less expensive materials, the bellows is also a cost- effective solution in applications where the valve is exposed to highly viscous or corrosive fluids.

EN 00-DA

The EN 00-DA Series valve contains an additional O-ring seat seal. This soft seat is the primary seal and it allows the valve to remain leak free at 95 percent of set pressure over 100 psig (6.89 barg). A backup metal seat provides additional safety for fire-relief applications when O-rings can be destroyed by high temperature exposure.

The EN 00-DA Series O-ring seat is available for set pressures up to 6250 psig (430.92 barg). Some soft seats offered by other manufacturers are limited to 1500 psig (103,42 barg).

EN00 UM/EN00 DA Series Safety Relief Valve

The highly adaptable GSSE EN00 Series safety relief valve can meet numerous application requirements.

Inlet Sizes:	1" through 12"
Inlet Ratings:	ASME Class 150 through 2500 EN 1092-1 PN 10 through PN 400
Outlet Sizes:	2" through 16"
Outlet Ratings:	ASME Class 150 and 300 EN 1092-1 PN 10 through PN 40
Orifice Sizes:	17 sizes - D through W
Set Pressure Range:	4 to 6250 psig (0.27 to 431 barg)
Temperature Range:	-450°F to 1500°F (-268°C to 815°C)
Materials:	Cast carbon steel body with stainless steel trim
Based On:	ASME B&PVC Section I (Liquid), Section III & VIII API 520, 521 and 526 NACE



Options for EN 00-UM Series Safety Relief Valve

EN 00-30-UM

The EN 00-30-UM Series valve includes the addition of a balanced bellows that is necessary to compensate for the effects of variable back pressure. By isolating the upper structure and allowing the use of less expensive materials, the bellows is also a cost-effective solution in applications where the valve is exposed to highly viscous or corrosive fluids.

EN 00-UM-DA Series Soft Seat

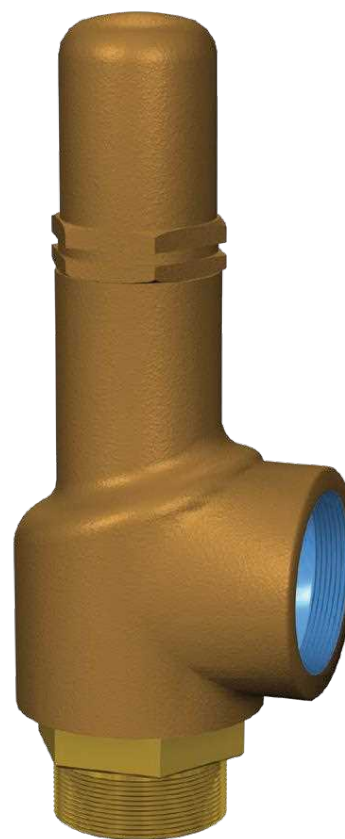
The EN 00-UM-DA Series soft seat contains an additional soft seal. This soft seat is the primary seal, and it allows the valve to remain leak free at 95 percent of set pressure over 100 psig (6.89 barg). A backup metal seat provides additional safety for fire-relief applications when soft goods can be destroyed by high temperature exposure. The GSSE EN 00-UM Series soft seat is available for set pressures up to 6250 psig (430.92 barg). Some soft seats offered by other manufacturers are limited to 1500 psig (103.42 barg).

EN000 Series Safety Relief Valve	
Inlet Sizes:	0.5" to 2"
Inlet Ratings:	Threaded and ASME Class 150 through 2500"
Outlet Sizes:	2" through 16"
Outlet Ratings:	Threaded and ASME Class 150 to 300
Orifice Sizes:	0.096 sq. in. through 0.567 sq. in.
Set Pressure Range:	5 to 8000 psig (0,34 to 551 barg)
Temperature Range:	-425°F to 1100°F (-254°C to 593°C)
Materials:	Cast carbon steel body with stainless steel trim
Based On:	ASME B&PVC Section III and VIII
	API 520, 521 and 526
	NACE



Options for EN 000 Series Safety Relief Valve
EN 000-MS Standard Design
Metal-to-metal seat construction. Seat tightness compliant with API 527.

EN 000-DA Series O-Ring Seat Option
Soft seat design offers bubble tight seats at up to 97 percent of valve set pressure for valves set at 101 psig (6.96 barg) and above. This option promotes higher, more efficient system operating pressures without significant seat leakage concerns.



EN82 Series Safety Relief Valve

Inlet Sizes:	0.5" to 2"
Inlet Ratings:	Threaded
Outlet Sizes:	Threaded
Orifice Sizes:	Four sizes – .121 sq. in. through 1.399 sq. in.
Set Pressure Range:	10 to 500 psig (0,69 to 34,47 barg)
Temperature Range:	-20°F to 800°F (-29°C to 427°C)
Materials:	Cast carbon steel body with stainless steel trim
Based On:	ASME B&PVC, Section III ASME B&PVC, Section VIII, Division I

ZV82 Series Safety Relief Valve

Inlet Sizes:	0.5" to 2.5"
Outlet Sizes:	0.75" through 2.5"
Outlet Sizes:	Threaded
Outlet Rating:	Threaded
Orifice Sizes:	D, E, F, G, H and J
Set Pressure Range:	15 to 300 psig (1 to 20,68 barg)
Temperature Range:	-325°F to 406°F (-198°C to 208°C)
Materials:	Cast bronze bonnet, brass base and trim and PTFE soft seats
Certifications:	Non-Coded

The EN82 Series safety relief valve is a preferred choice for OEM and skid manufacturers requiring high-relief capacity from a small valve. The EN82 offers superior seat tightness and blowdown performance for most media applications.

The ZV82 Series pressure relief valve features an enclosed design for non-corrosive, thermal relief and liquid service applications.



ZN00 Series Pilot-Operated Safety Relief Valve	
Inlet Sizes:	1" through 12"
Inlet Ratings:	ASME Class 150 through 2500
Outlet Ratings:	ASME Class 150 and 300
Outlet Size:	2" through 16"
Orifice Sizes:	Seventeen sizes – D through W
Set Pressure Range:	15 to 6250 psig (1 to 431 barg)
Temperature Range:	-40°F to 505°F (-40°C to 263°C) Above 505°F with heat exchanger
Materials:	Stainless steel pilot with carbon steel main valve and stainless steel trim
Based On:	ASME B&PVC Section I (Liquid) & Section VIII API 520, 521 and 526 NACE

The ZN00 Series pilot-operated safety relief valve combines the advantages of two products into one—the EN00 safety relief valve and the SN00 POSRV. The ZN00 POSRV can replace spring-loaded relief valves without requiring modified outlet piping.

DN00 Series Pilot-Operated Safety Relief Valve	
Inlet Sizes:	1" through 12"
Inlet Ratings:	ASME Class 150 through 2500
Outlet Ratings:	ASME Class 150 and 300
Outlet Size:	2" through 16"
Orifice Sizes:	Fourteen sizes – D through T (Full bores)
Set Pressure Range:	Full Bores 15 to 6250 psig
Temperature Range:	-40°F to 505°F (-40°C to 263°C) Above 505°F with heat exchanger
Materials:	Stainless steel pilot with carbon steel main valve and stainless steel trim
Certifications:	ASME B&PVC Section I (Liquid) & Section VIII API 520, 521 and 526 NACE

The DN00 Series pilot-operated safety relief valve is a non-flowing design available in a modulating or pop-action pilot. The DN00 POSRV is suitable for the overpressure protection of many pressurized systems and vessels in the chemical, petrochemical, paper mill, oil and gas production and transmission industries.

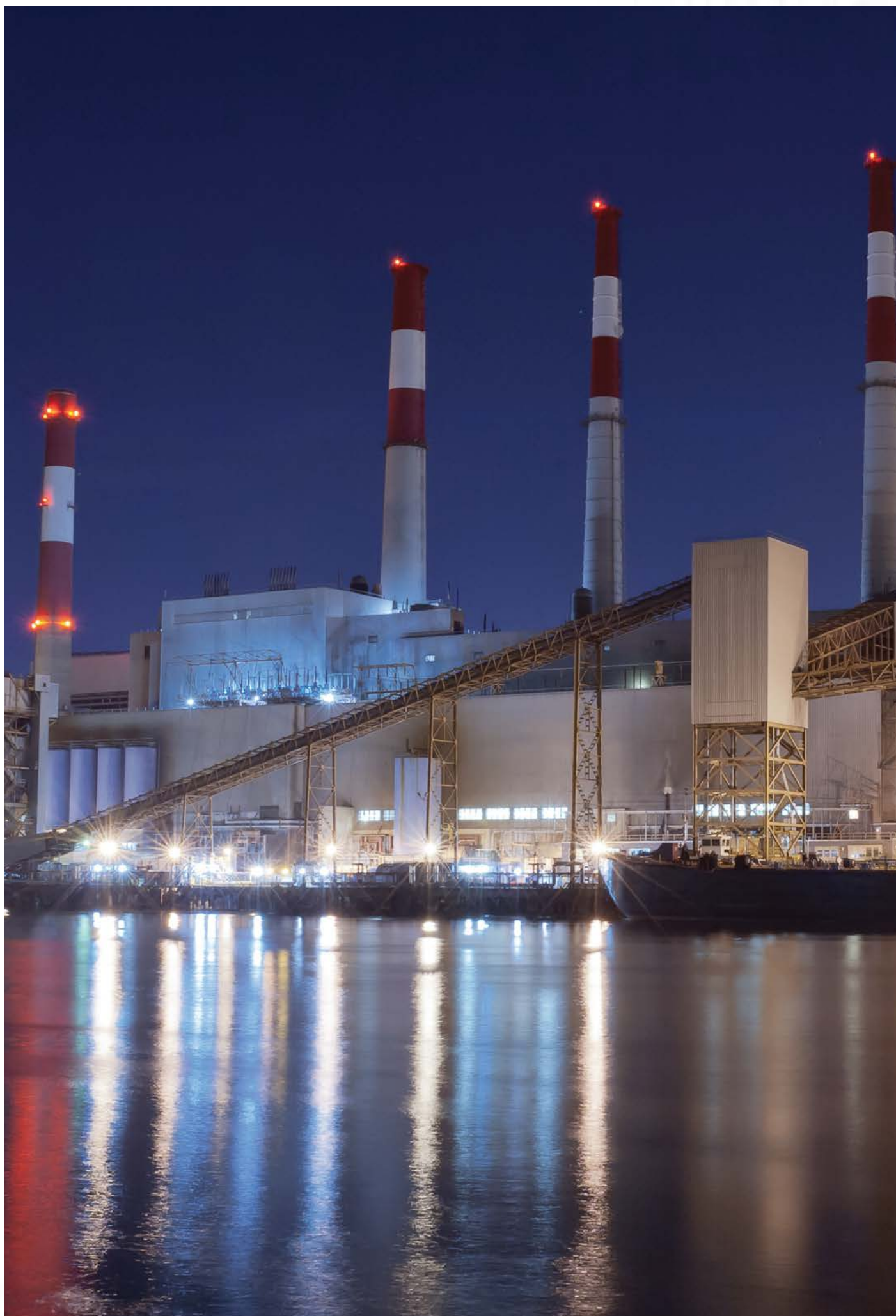


VN00 Series Pilot-Operated Safety Relief Valve	
Inlet Sizes:	1" to 8"
Inlet Ratings:	ASME Class 150 through 2500
Outlet Ratings:	ASME Class 150 and 300
Outlet Size:	2" through 10"
Orifice Sizes:	Fourteen sizes – D through T
Set Pressure Range:	15 to 7200 psig (1 to 496 barg)
Temperature Range:	40°F to 505°F (-40°C to 263°C)
Materials:	Stainless steel pilot with carbon steel main valve and stainless steel trim
Certifications:	ASME B&PVC Section VIII API 520 and 521 NACE

The VN00 Series pilot-operated safety relief valve is a tubeless valve for oil and gas production and the offshore industry.

ED900 Series Pilot-Operated Safety Relief Valve	
Inlet Sizes:	16" to 20"
Inlet Ratings:	ASME Class 300
Outlet Ratings:	ASME Class 150
Outlet Size:	18" through 24"
Orifice Sizes:	114, 143.1, 176.7 and 201 sq. in.
Set Pressure Range:	50 to 300 psig (3,44 to 20,68 barg)
Temperature Range:	250°F to 550°F (121°C to 288°C)
Typical Application:	Moisture Separator Reheater Systems
Materials:	Carbon Steel with Stainless Steel trim
Certifications:	ASME B&PVC Section VIII API 520 and 521 NACE

The ED900 Series pilot-operated safety relief valve is configured for high-capacity steam overpressure protection for moisture separator reheater systems.



GSSE Boiler Safety Valves

EA11 Series Safety Valve

The GSSE EA11 Series safety valve is a cost-effective, high-capacity, flanged-steel safety valve for steam service.



Inlet Sizes:	1.25" through 6"
Inlet Ratings:	ASME Class 300 and 600
Outlet Sizes:	1.5" through 8"
Outlet Ratings:	ASME Class 150
Orifice Sizes:	10 sizes – F through Q
Set Pressure Range:	15 to 725 psig (1 to 50 barg)
Temperature Range:	Up to 1000°F (538°C)
Materials:	Alloy and carbon steel cast body with stainless steel trim
Based On:	ASME B&PVC Section I and VIII, PED and SQL ISO 4126-1, 4126-3

EF11 Series Safety Valve

The GSSE EF11 Series safety valve is configured for low pressure, steam-heating boilers and steam generators as well as air service applications.



Inlet Sizes:	1.5" through 6"
Inlet Ratings:	ASME Class 250
Outlet Sizes:	2.5" through 4"
Outlet Ratings:	ASME Class 125
Orifice Sizes:	8 sizes – H through Q
Set Pressure Range:	15 to 250 psig (1 to 17,24 barg)
Temperature Range:	-20°F to 420°F (-29°C to 215°C)
Materials:	Cast iron body with brass trim
Based On:	ASME B&PVC Section I and VIII, PED and SQL

GSSE Boiler Safety Valves

EF41, EF43 Series Safety Valve

The GSSE EF41 and EF43 Series safety valves are configured for steam and other compressible fluids. Compression media is limited to non-toxic, non-flammable, non-corrosive service. They are most commonly used in pharmaceutical and process plants.

Inlet Sizes:	.5" through 2.5"
Outlet Sizes:	.75" through 2.5"
Orifice Sizes:	D, E, F, G, H and J
Set Pressure Range:	15 to 350 psig (1 to 24,13 barg)
Temperature Range:	-20°F to 420°F (-29°C to 215°C)
Materials:	Cast iron bonnet with brass base and trim
Based On:	ASME B&PVC Section I and VIII



INNOVATIVE FLUID MANAGEMENT TECHNOLOGY

DF00-5 Series Electromatic Ball Valve

The GSSE DF00-5 Series Electromatic ball valve offers automatic or manual overpressure protection for steam boiler systems, and can also be used to assist start-up and shut-down venting.

Inlet Sizes:	1.5" / 2" / 2.5" / 3" / 4"
Inlet Ratings:	ASME Class 1500, 2500, 3100 and 4500
Outlet Sizes:	3" / 4" / 6"
Outlet Ratings:	ASME Class 300 and 900
Set Pressure Range:	50 to 6000 psig (3,45 to 414 barg)
Temperature Range:	Up to 1150°F (621°C)
Materials:	Alloy steel body with Colmonoy® coated inconel alloy seat and ball
Based On:	ASME B&PVC Section I 'V' code stamp on once through boilers (full bore only) and non-code Section I



GSSE Boiler Safety Valves

EN00/P Series Safety Valve

The GSSE EN00/P Series steam internal series is configured for ASME B&PVC Section I non-power boiler and organic vapor service applications.

Inlet Sizes:	1" through 8"
Inlet Ratings:	ASME Class 150 through Class 2500
Outlet Sizes:	2" through 10"
Outlet Ratings:	ASME Class 150 and 300
Orifice Sizes:	14 sizes – D through T
Set Pressure Range:	5 to 6000 psig (0,34 to 414 barg)
Temperature Range:	-20°F to 850°F (-29°C to 454°C)
Materials:	Carbon steel body with stainless steel trim
Based On:	ASME B&PVC Section I and PED and SQL ISO 4126-1, 4126-3 IBR



ZN00-40 Series Pilot Operated Safety Valve

The GSSE ZN00-40 Series pilot operated safety valve offers superior performance while meeting the stringent requirements of boiler applications. This product is especially suited for economizer service and is certified to ASME B&PVC Code Case 2446. It offers maximum seat tightness and a shorter blowdown that can help to minimize steam loss. It also operates closer to set pressure.

Inlet Sizes:	1" to 12"
Inlet Ratings:	ASME Class 150 through Class 2500 EN 1092-1 PN 10 through PN 400
Outlet Sizes:	2" through 16"
Orifice Sizes:	12 sizes - D through Q
Outlet Ratings:	ASME Class 150 and 300 EN 1092-1 PN 10 through PN 40
Set Pressure Range:	15 to 5800 psig (1 to 400 barg)
Temperature Range:	-40°F to 505°F (-40°C to 263°C) Above 505°F with heat exchanger
Materials:	Main Valve: Carbon steel base and 316 stainless steel internal components Pilot Valve: 316 stainless steel base and internal components
Based On:	ASME B&PVC Section I ISO 4126-4



GSSE Boiler Safety Relief Valves

ES00 Series Maxiflow Safety Valve

The GSSE ES00 Series Maxiflow high pressure safety valve is a premium product that is installed on the majority of power generating stations worldwide to help protect boilers from overpressure conditions.

Inlet Sizes:	1.5" through 8"
Inlet Ratings:	ASME Class 600 through 4500 Flanged and BWE
Outlet Sizes:	3" through 10" flanged
Outlet Ratings:	ASME Class 150 and 300
Orifice Sizes:	11 sizes – 1 through T
Set Pressure Range:	100 to 5800 psig (6,90 to 400 barg)
Temperature Range:	Up to 1200°F (649°C)
Materials:	Alloy and carbon steel cast body with stainless steel trim
Based On	ASME B&PVC Section I and VIII, PED and SQL ISO 4126-1, 4126-3 IBR



INNOVATIVE FLUID MANAGEMENT TECHNOLOGY

ZS00 Series Safety Valve

The GSSE ZS00 Series safety valve can meet the specific requirements of the co-generation and waste-to-energy markets.

Inlet Sizes:	1.5" through 6"
Inlet Ratings:	ASME Class 600, 900 and 1500
Outlet Sizes:	3" through 8"
Outlet Ratings:	ASME Class 150 and 300
Orifice Sizes:	7 sizes – 1 through Q
Set Pressure Range:	100 to 1600 psig (6,90 to 110 barg)
Temperature Range:	Up to 1050°F (565°C)
Materials:	Alloy and carbon steel cast body with stainless steel trim
Based On:	ASME B&PVC Section I and VIII, PED and SQL ISO 4126-1, 4126-3 IBR



Gsse types of control valves



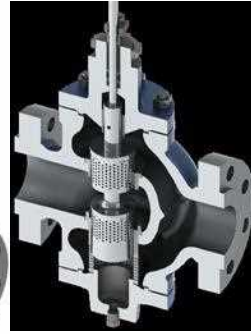
MF



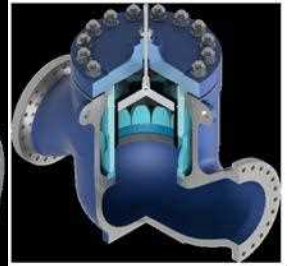
TG



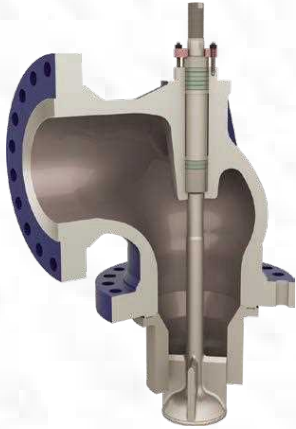
LG



DP



CG / VL



TD



HOV



LMF



SF



NABA



SB



RF



BFT



BFD



3 WAY



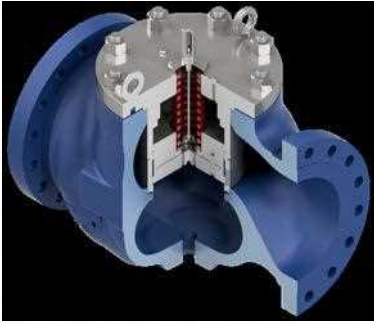
ARC VALVE

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		Micro 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
BFT	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 STUCK					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



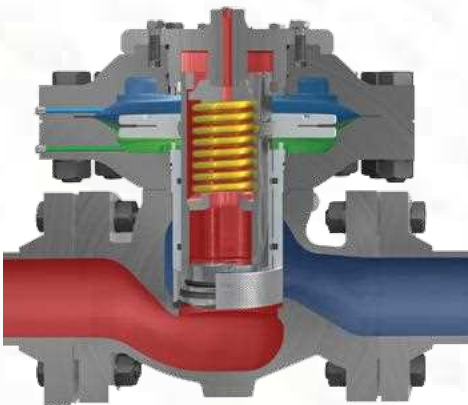
N2B



N2S



DE0A



E2H



T5L



ZN98-ZN TGC



MN5R



N9



Y-Z93



Z30

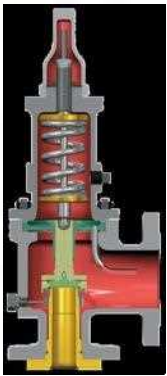
PRESSURE REGULATOR VALVES

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

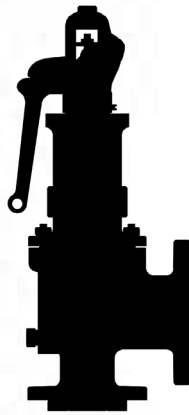
BACK PRESSURE REGULATOR AND RELIEF VALVES

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



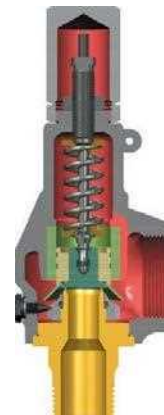
EN00-P



EN00-UM



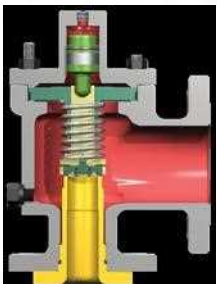
EN000



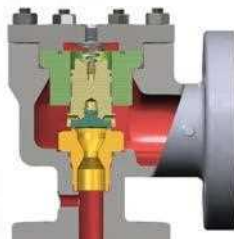
EN82



ZV82



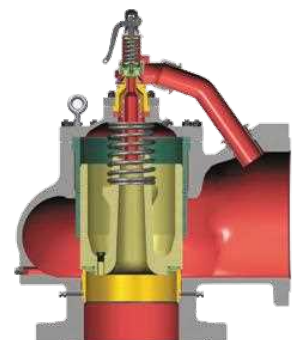
ZN00



DN00



VN00



EDN00



ES00



ZS00



EA11



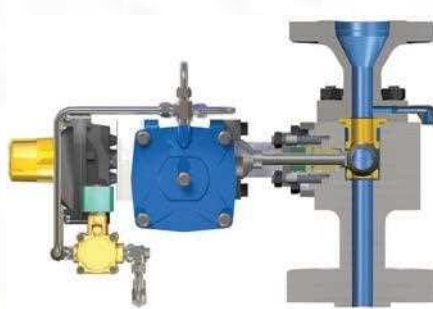
EF11



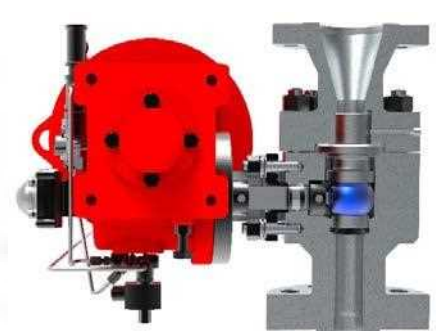
EF41-3



ZN00-40



DF00-5



DF00-B



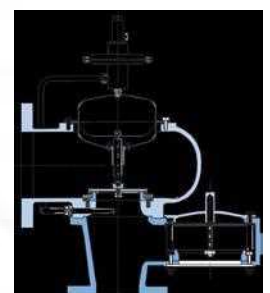
VN20



VN10



VN20-A



GSSE MODLE SERIES	CONSTRUCTION			INLET SIZE		INLET RATING		OUTLET RATING			OUTLET SIZE		OUTLET RATING			ORIFICE SIZES			SET PRESSURE RANGE		TEMPERATURE RANGE		ASME SEC I	ASME SEC VIII
	CONVEN TIONAL	BELLOWS	PILOT	In	Psi	In	Psi	In	Psi	D	W	4	6250	-268	815	*	*							
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



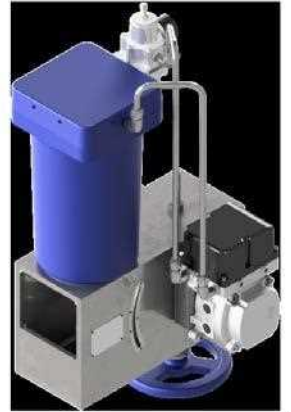
DM



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 Electro Pneumatic Positioner

Volume 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:

Gorooh 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. Osharjan 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 fulfillment of conditions set out in the Certification Agreement may render the Certificate invalid. Any changes to the product shall immediately be reported to IPICB in order to verify whether the Certificate remains valid.
 Address: Iranian Petroleum Institute, No. 307, Third Alley, Mosharraf Ave, Tehran, Iran. Tel: +9821-85700322
 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.

Page 1 of 2

 *Scope of Certificate*

Gorooh Sazandegan Sanat Espadana Co.

Certificate No: **960969**

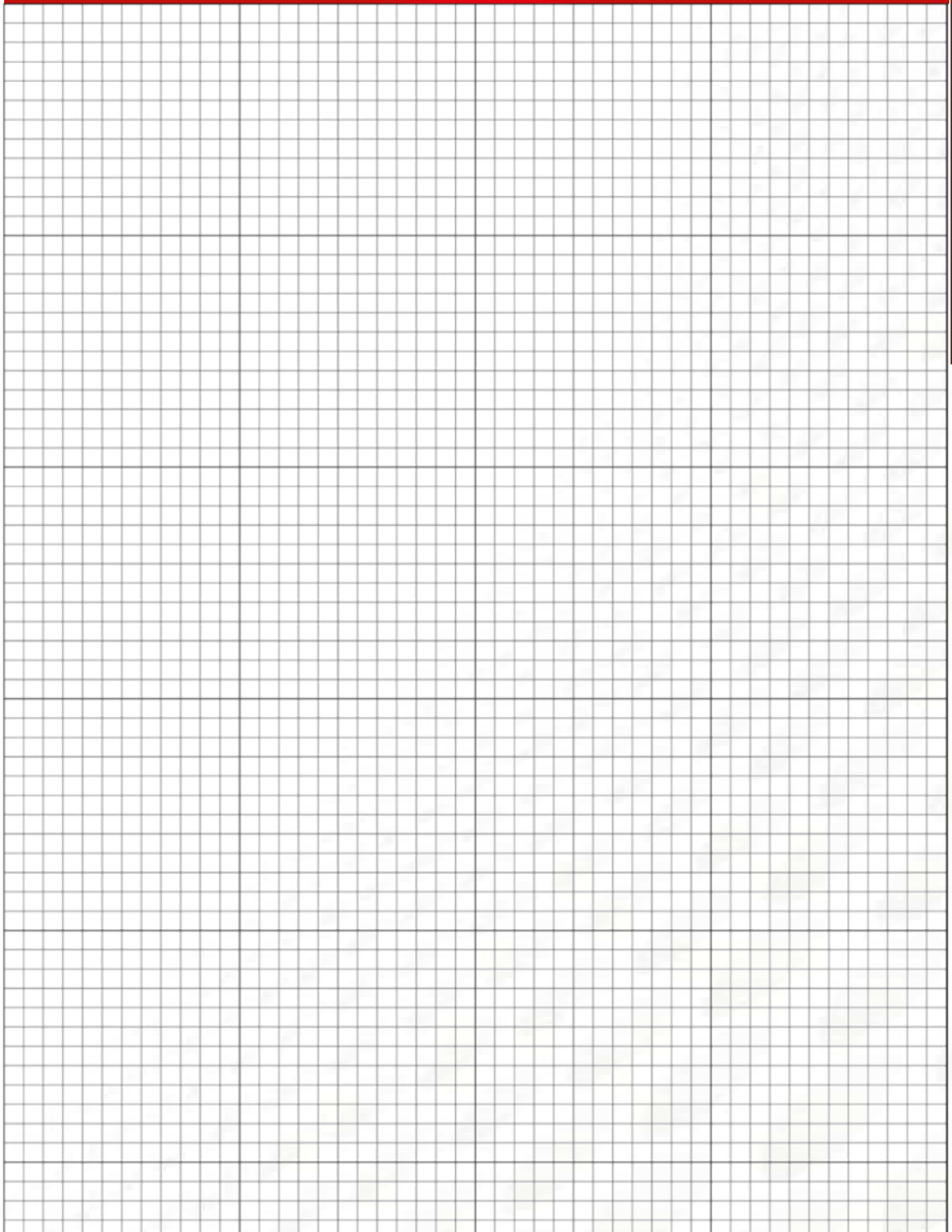
Product(s)	Specification	Reference Standard(s)/ Manufacturer Procedure
Globe Control Valve	Pressure Class 300: Up to Size 24" Pressure Class 900: Up to Size 20" Pressure Class 1500: Up to Size 3"	IEC 60534-1 January 2005, 3 rd Ed.
Butterfly Control Valve	Pressure Class 300: Up to Size 24" Pressure Class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

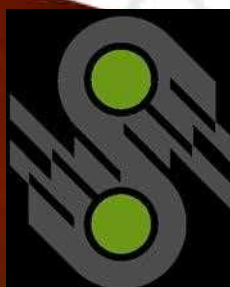
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Page 2 of 2







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,
Esfahan - IRAN



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+98 313 760 7478