

GSSE

INDUSTRIAL REGULATOR GENERAL CATALOGUE

MADE IN IRAN

**PRESSURE REGULATOR
BACK PRESSURE REGULATOR
FOR
LIQUID, STEAM, PROCESS GAS
AND AIR
TANK BLANKETING VALVE**



**TOTAL SOLUTION FOR YOUR
PROCESS REQUIREMENTS**



GSSE

is a known design and Power plant

engineering team design and simulation 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 Reducing Regulator Valve & Tank)
- On-Off Valve (Ball valves, Orbital)

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. 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.

ing facilities assembly and test equip-
ce to our clients.

ur engineering office to the manufactur-
n the shortest time.



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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.

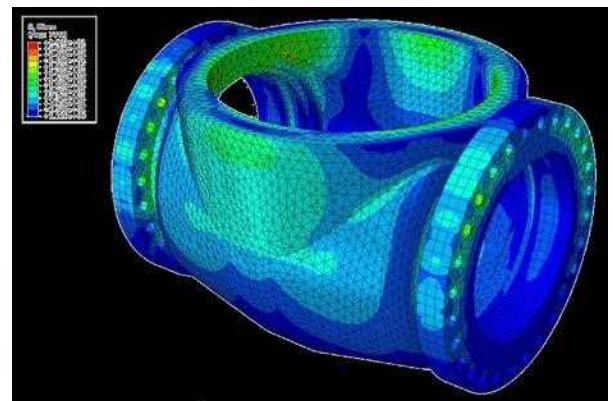
We provide spare parts to support our customers.

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.

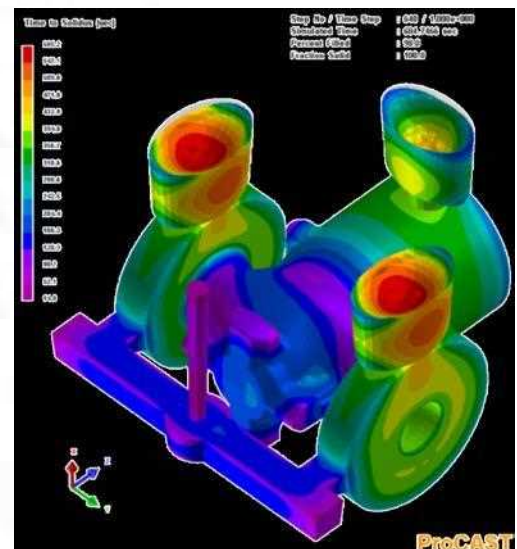
FEA Simulation

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.

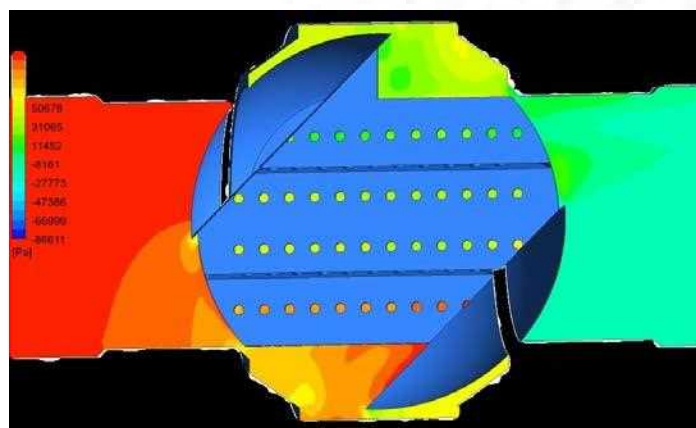


CFD Simulation

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.

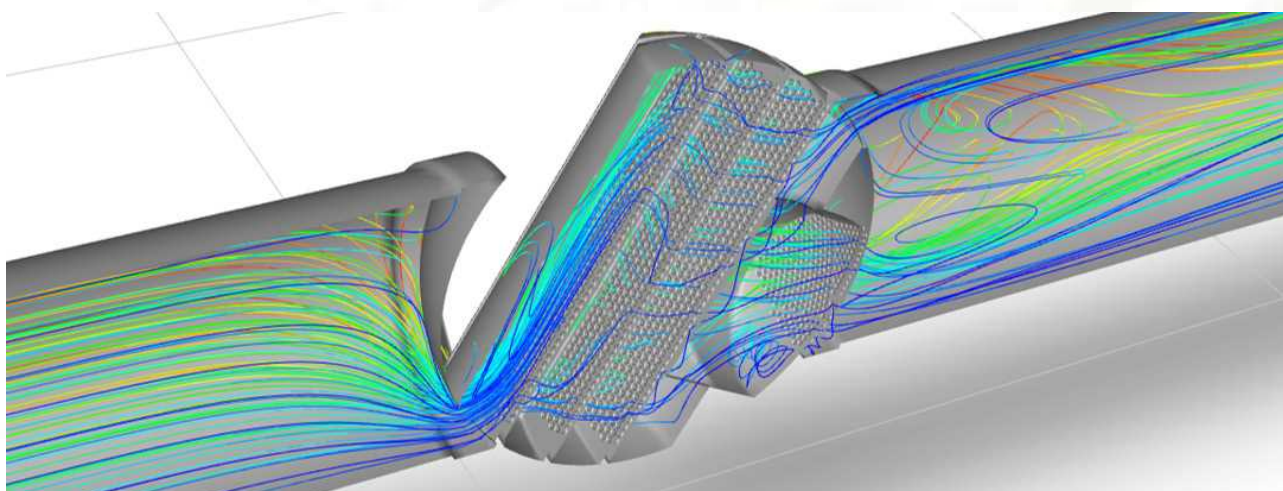
To overcome these limitations and problems we have done a thorough numerical and experimental analysis of control valves. The main influential geometry parameters of the control valve are defined for numerical analyses. In the next step the basic theory of the numerical simulation, including the 3D modeling, 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 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:



Pressure Reducing Regulators

Direct-Operated and Pilot-Operated

Regulators are self-contained, control devices which use energy from the controlled system to operate whereas control valves require external power sources, transmitting instruments and control instruments.

Pressure Reducing Regulators

A pressure reducing regulator maintains a desired outlet pressure while providing the required fluid flow to satisfy a downstream demand. The pressure which the regulator maintains is the outlet pressure setting (setpoint) of the regulator.

Pressure Reducing Regulator Type

The two main types of regulators:

1- Direct-Operated

2- Pilot-Operated

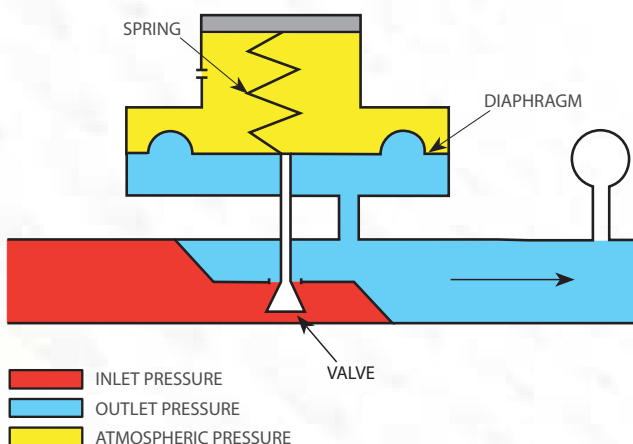


Figure 1. Direct-Operated Regulator

Direct-Operated Regulators

Direct-Operated regulators are the simplest style of the regulators. At low set pressures, typically below 1 psig / 0.07 bar, they can have very accurate ($\pm 1\%$) control. At high control pressures, up to 500 psig / 34.5 bar, 10% to 20% control is typical.

In operation, a direct-operated, pressure reducing regulator senses the downstream pressure through either internal pressure registration or external control line. This downstream pressure opposes a spring which moves the diaphragm and valve plug to change the size of the flow path through the

regulator. Direct-operated regulators have many commercial and residential uses. Typical applications include industrial, commercial and domestic gas service or instrument air.

Pilot-Operated Regulators

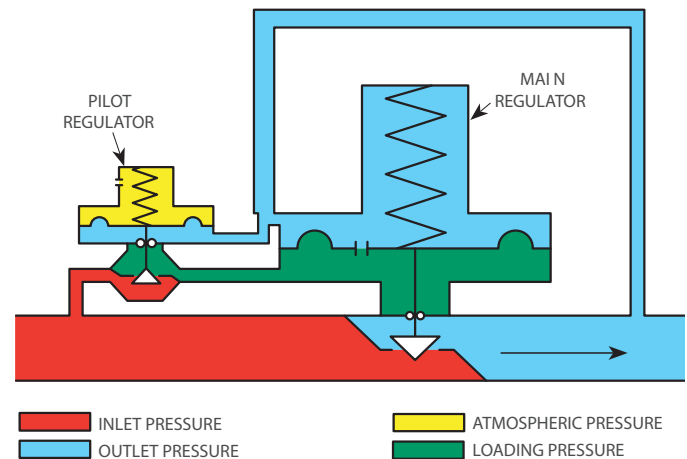


Figure 2. Pilot-Operated Regulator

Pilot-Operated regulators are preferred for high flow rates or where precise pressure control is required. A popular type of pilot-operated system uses two-path control. In two-path control, the main valve diaphragm responds quickly to downstream pressure changes, causing an immediate correction in the main valve plug position. At the same time, the pilot diaphragm diverts some of the reduced inlet pressure to the other side of the main valve diaphragm to control the final positioning of the main valve plug. Two-path control results in fast response and accurate control.

Pressure Reducing Regulator Selection

The majority of applications require a pressure reducing regulator. Assuming the application calls for a pressure reducing regulator. The following parameters must be determined:

Outlet pressure to be controlled

Inlet pressure to the regulator

Capacity required

Shut-off capability required

Process fluid

Process fluid temperature

Accuracy required

Pipe size required
End connection style
Material requirements
Control line needed
Overpressure protection

A pressure relief valve is a control device that opens to relieve fluid to atmosphere during an overpressure occurrence. A backpressure regulator is a control device that maintains a constant upstream pressure throughout a given flow range.

Relief Valve Types

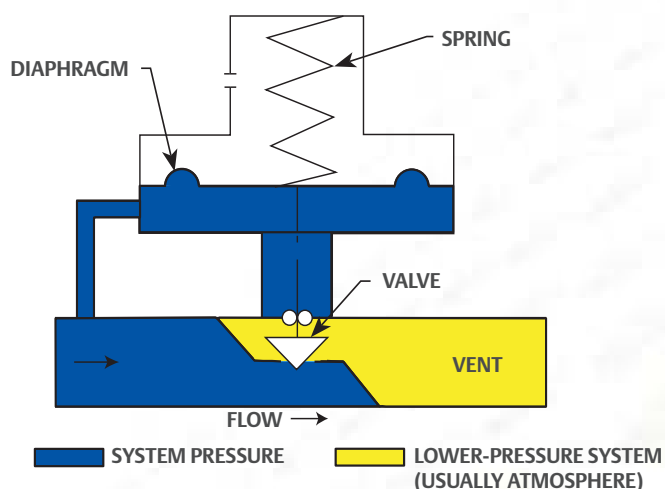
Relief valves are available in four general types: pop type, direct-operated, pilot-operated and internal relief valves.

Direct Operated Relief Valve

System pressure is referenced under a diaphragm and opposed by a spring. As system pressure increases past the setpoint, the relief valve opens which allows fluid to escape and protects the system. The increase in pressure above the relief setpoint that is required to produce more flow through the relief valve is referred to as pressure buildup.

Figure 3. Direct-Operated Relief Valve

Direct-Operated relief valves are commonly used in industry to protect industrial furnaces and other equipment.

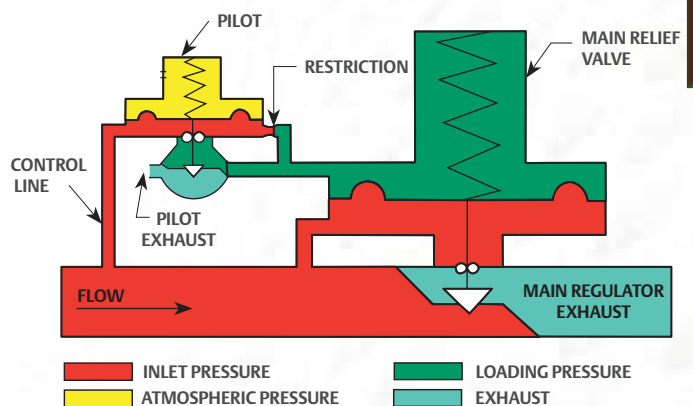


Pilot-Operated Relief Valves

In normal operation, when system pressure is below setpoint of the relief valve, the pilot remains closed.

This allows loading pressure to register on top of the main relief valve diaphragm. Loading pressure on top of the diaphragm is opposed by an equal pressure (inlet pressure) on the bottom side of the diaphragm. With little or no pressure differential across the diaphragm, the spring keeps the valve seated. When the system pressure increases past the setpoint, the pilot opens and exhausts the loading pressure from the top of the relief valve main diaphragm which allows the main valve to open.

Figure 4. Pilot-Operated Relief Valve

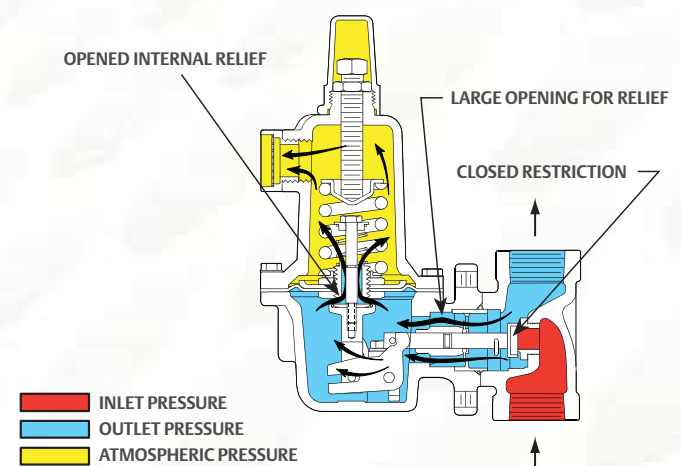


Pilot-operated relief valves are used in applications requiring high-capacity and low-pressure buildup.

Internal Relief

The regulator shown in Figure 5 includes an internal relief valve. The relief valve has a measuring element (the main regulator diaphragm), a loading element (a light spring) and a restricting element (a valve seat and disk).

Figure 5. Internal Relief



Relief Valve and Backpressure Regulator

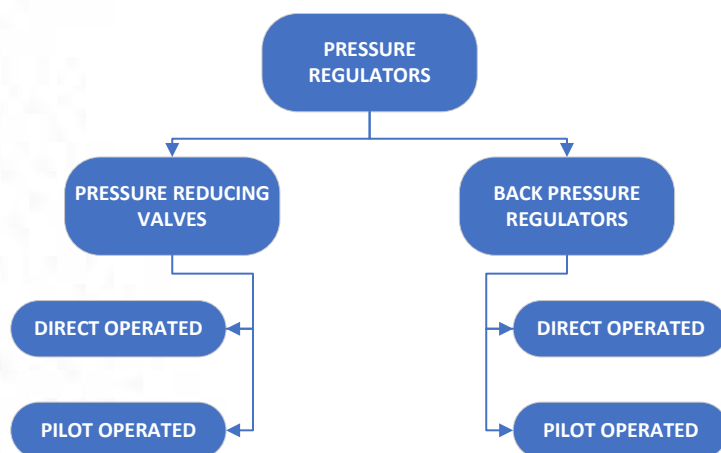
The relief valve assembly is located in the center of the regulator diaphragm. Internal relief is often used in industrial applications where atmospheric exhaust is acceptable and low buildup is not required.

Backpressure Regulator Selection

Backpressure regulators control the inlet pressure rather than the outlet pressure. The selection criteria for the backpressure regulator is the same as for a pressure reducing regulator.

Pressure Regulators:

Regulators are self-contained, control devices which use energy from the controlled system to operate whereas control valves require external power sources, transmitting instruments and control instruments.



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

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

Pressure Regulator (Pilot-operated)

N2B

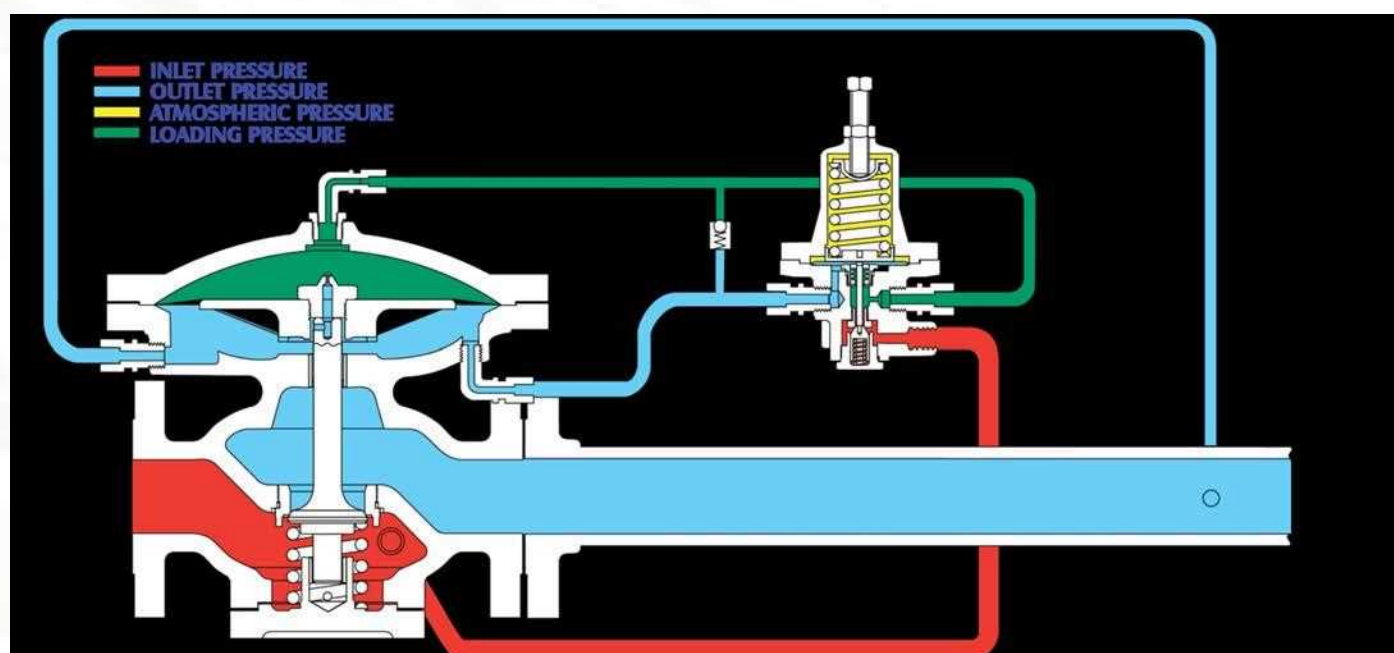
The Type N2B Pressure Reducing Valve is the standard steam valve for industry. The Type N2B is designed to provide decades of continuous service. It can withstand dirty operating environments while providing accurate and stable pressure control. The Type N2B is applied as a main Pressure Reducing Valve in industrial process heating , Specially designed for hot water heat exchangers, absorption , chillers and boiler deaerator tanks.

Body Size	NPS 1, 1-1/2, 2, 3 and 4 / DN 25, 40, 50, 80 and 100
Outlet Pressure Range	2 to 250 psig / 0.14 to 17.2 bar
Maximum Inlet Pressure	300 psig / 20.7 bar
Maximum Temp Capacity	600°F / 316°C
Maximum Capacity	42,400 lbs/h / 19,234 kg/h
Operation Method	Pilot-Operated
Body Material	Cast Iron, Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm³/h
2 to 250 / 0.14 to 17.2		*					N2B	Pilot	1, 1-1/2, 2, 3 and 4	300 / 20.7	42,400 lbs/h /19,234 kg/h



Pressure Regulator (Pilot-operated)

N2S

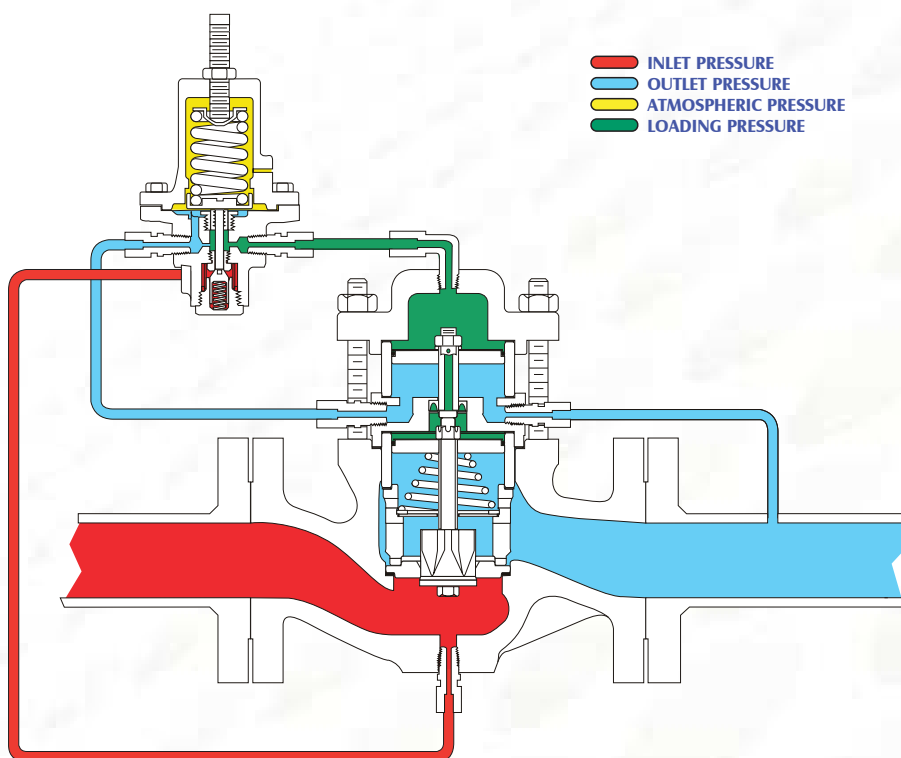
The Type N2S regulator is piston actuated for high cycle steam service with hardened trim for improved durability. This valve should be used with clear, dry or superheated steam. Noise reduction trim is available.

Body Size	NPS 1, 1-1/2, 2, 2-1/2, 3, 4 and 6 x 4 / DN 25, 40, 50, 65, 80, 100 and 150 x 100
Outlet Pressure Range	2 to 250 psig / 0.14 to 17.2 bar
Maximum Inlet Pressure	300 psig / 20.7 bar
Maximum Temp Capacity	650°F / 343°C*
Maximum Capacity	45,100 lbs/h / 20,457 kg/h
Operation Method	Pilot-Operated
Body Material	Cast Iron, Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
2 to 250 / 0.14 to 17.2		*					N2S	Pilot	1 to 6 x 4	300 / 20.7	45,100 lbs/h / 20,457 kg/h



Pressure Reducing Regulator (Direct-operated)

ME05R

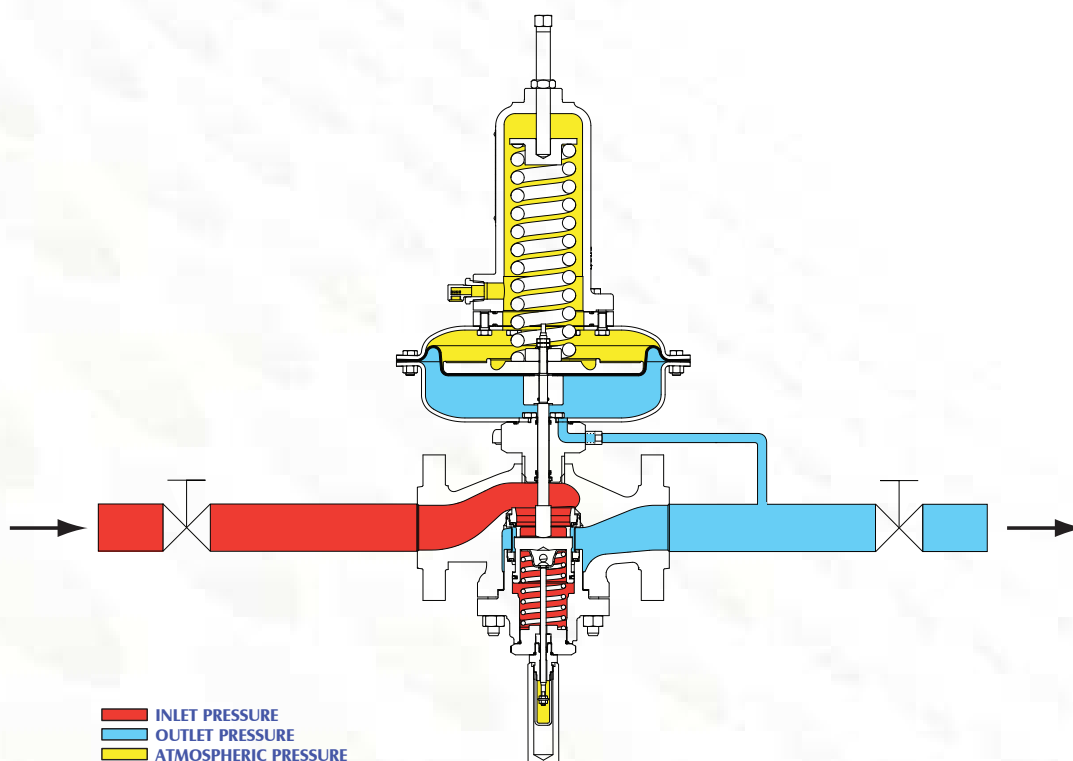
The Type ME05R is fast-response, high-capacity, direct-operated multi-purpose regulator designed to handle different applications and flow media. It is available in linear and quick opening trim cages and is designed to meet API 614 as required by lube oil manufacturers. Also in Low pressure and high pressure for Liquid, Air and Gas Services

Body Size	NPS 1, 2, 3 and 4 / DN 25, 50, 80 and 100
Outlet Pressure Range	5 to 300 psig / 0.34 to 20.7 bar
Maximum Inlet Pressure	400 psig / 276 bar
Maximum Capacity	1650 gpm / 6240 l/min
Operation Method	Direct-Operated
Body Material	Cast Iron, Steel and Stainless Steel
Maximum Temp Capability	250°F / 121°C*



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm³/h
5 to 300 / 0.34 to 20.7	*			*	*	*	ME05R	Direct	1, 2, 3 and 4	400 / 27.6	1650 gpm / 6240 l/min



Back Pressure Regulator (Direct-operated)

ME08R

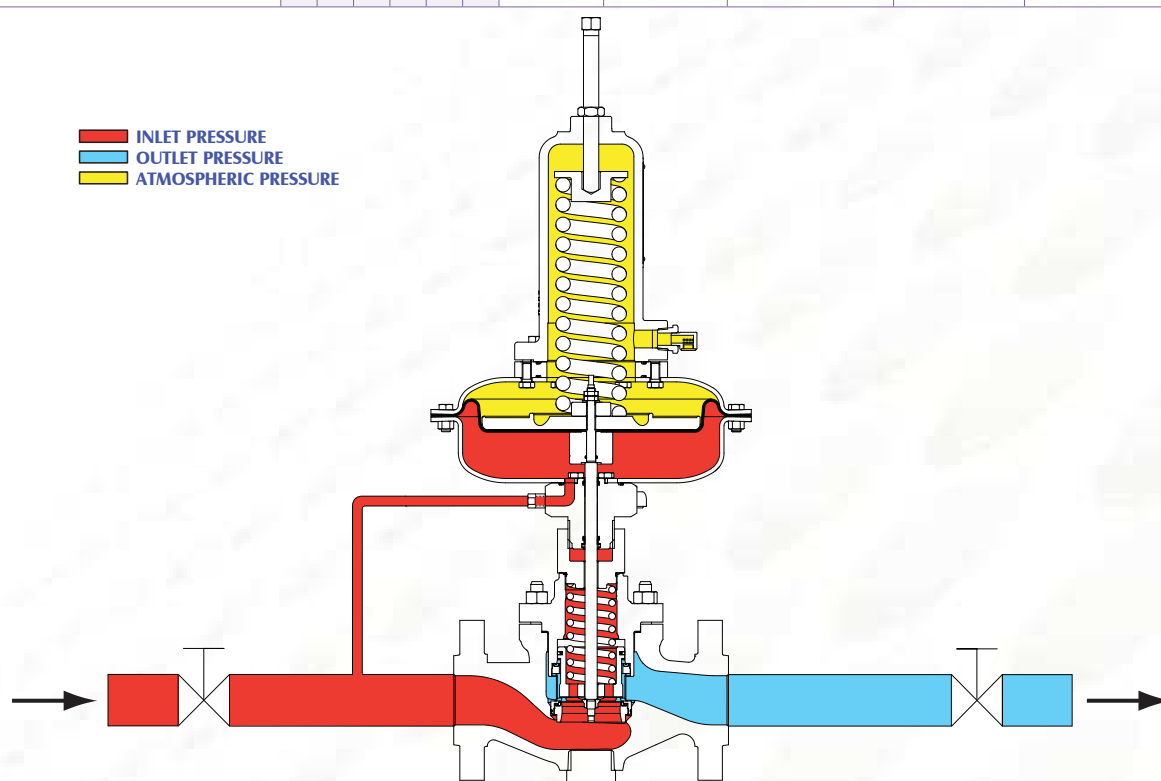
The Type ME08R regulators are direct-operated, backpressure, high-capacity, multi-purpose regulators. It provides a simple, reliable and economical backpressure control in multi-purpose applications suitable for different flow media including liquid, air and gas. Applications include lube oil systems and any application where speed of response is critical, minimum differential pressure is a requirement or fluid is not free of impurities.

Body Size	NPS 1, 2, 3 and 4 / DN 25, 50, 80 and 100
Back pressure Control Range	5 to 300 psig / 0.34 to 20.7 bar
Maximum Inlet Pressure	400 psig / 27.6 bar
Maximum Capacity	1460 gpm / 5530 l/min
Operation Method	Direct-Operated
Body Material	Cast Iron, Steel and Stainless Steel
Maximum Temp Capability	250°F / 121°C*



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
5 to 300 / 0.34 to 20.7	*			*	*	*	ME08R	Direct	1, 2, 3 and 4	400 / 27.6	1460 gpm / 5530 l/min



Pressure Reducing Regulator (Pilot-operated)

E2H

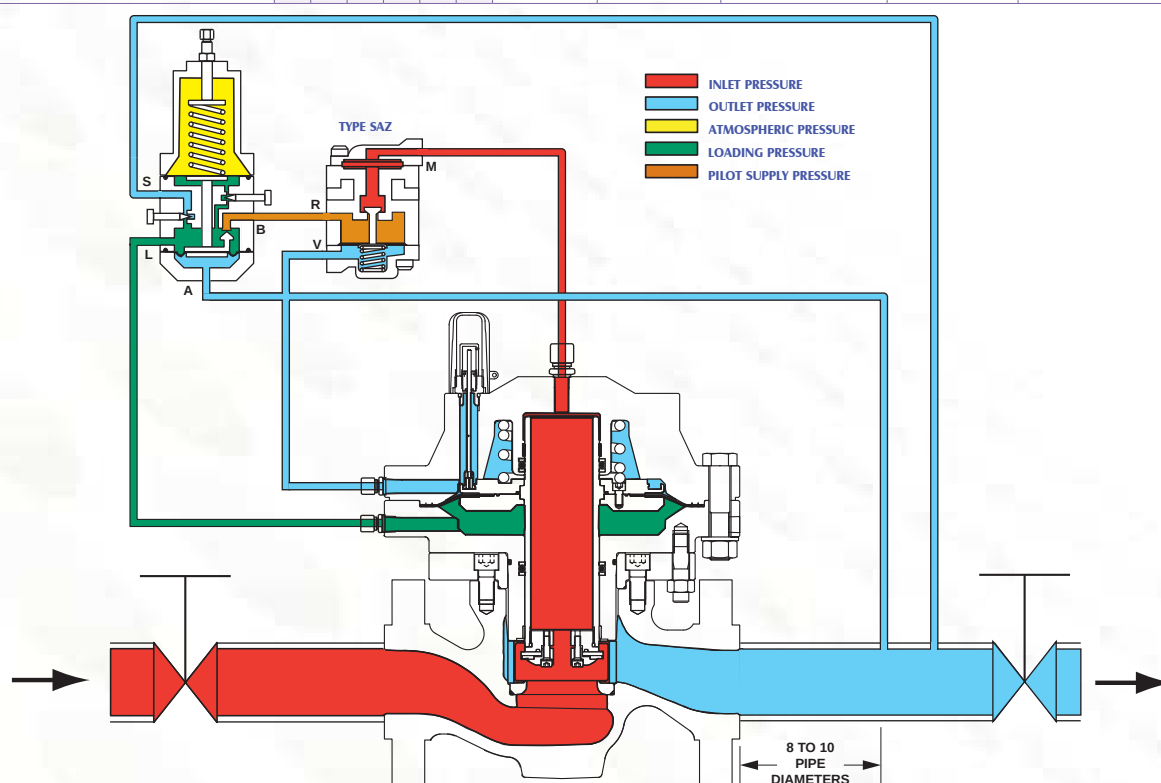
The E2H and E2HSO Series regulators are accurate pilot-operated, pressure balanced and soft seated regulators. They are designed for use in large capacity distribution systems and power plant feeds. They provide smooth, reliable operation, tight shutoff and long life.

Body Size	NPS 1,2,3,4,6,8 and 12X6 DN 25,50,80,100,150,200,300 X 150
Outlet Pressure Range	29 to 609 psig / 2 to 42 bar
Maximum Inlet Pressure	1500 psig/ 103bar
Maximum Capacity	43,411,000 SCFH / 1,163,000 Nm ³ /h
Operation Method	Pilot-Operated
Body Material	Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
14.5 to 1160 / 1.0 to 80.0	*				*	*	E2H	Pilot	1, 2, 3 and 4	400 / 27.6	1650 gpm / 6240 l/min



Back Pressure Regulator (Pilot-operated)

E2H-R

The E2H-R Series Back regulators are accurate pilot-operated, pressure balanced and soft seated regulators. They are designed for use in large capacity distribution systems and power plant feeds. They provide smooth, reliable operation, tight shutoff and long life.

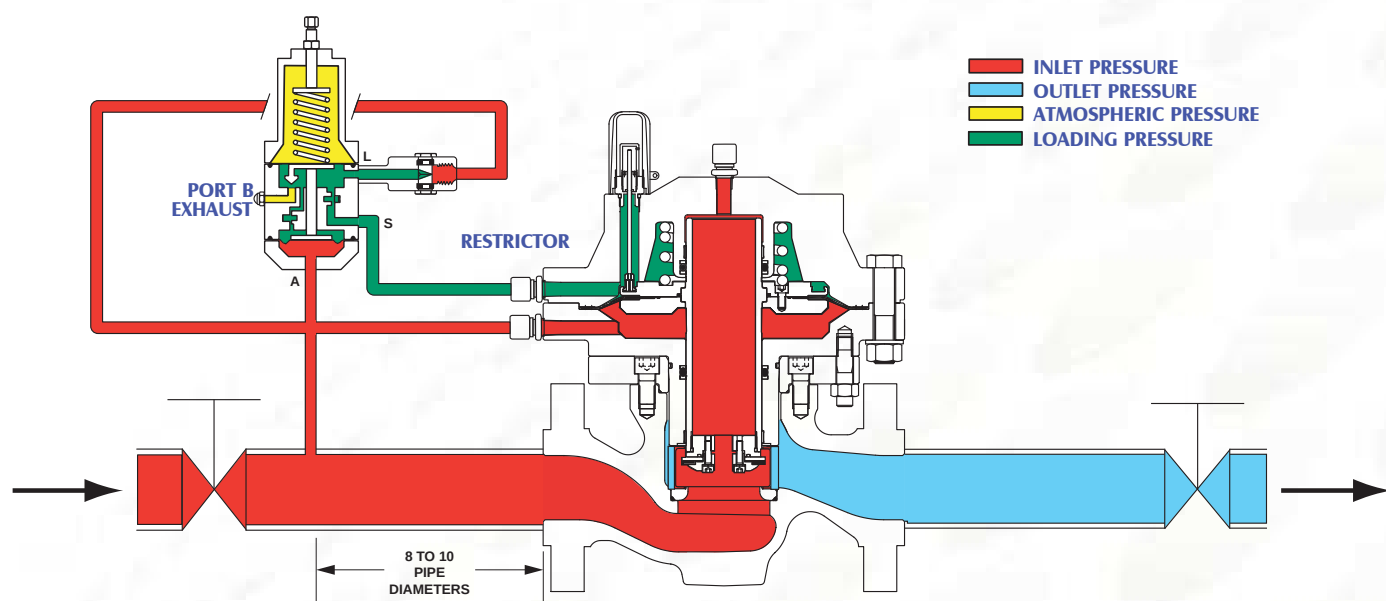
Body Size	NPS 1,2,3,4,6,8 and 12X6 DN 25,50,80,100,150,200,300 X 150
Outlet Pressure Range	29 to 609 psig / 2 to 42 bar
Maximum Inlet Pressure	1500 psig/ 103bar
Maximum Capacity	43,411,000 SCFH / 1,163,000 Nm ³ /h
Operation Method	Pilot-Operated
Body Material	Steel



INNOVATIVE FLUID MANAGEMENT TECHNOLOGY

Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
29 to 609 / 2 to 42	*				*	*	E2H-R	Pilot	1 to 4,6,8,12X6	1500 / 103	43,411,000 / 1,163,000



Pressure Reducing Regulator (Pilot-operated)

ZN98-TGC

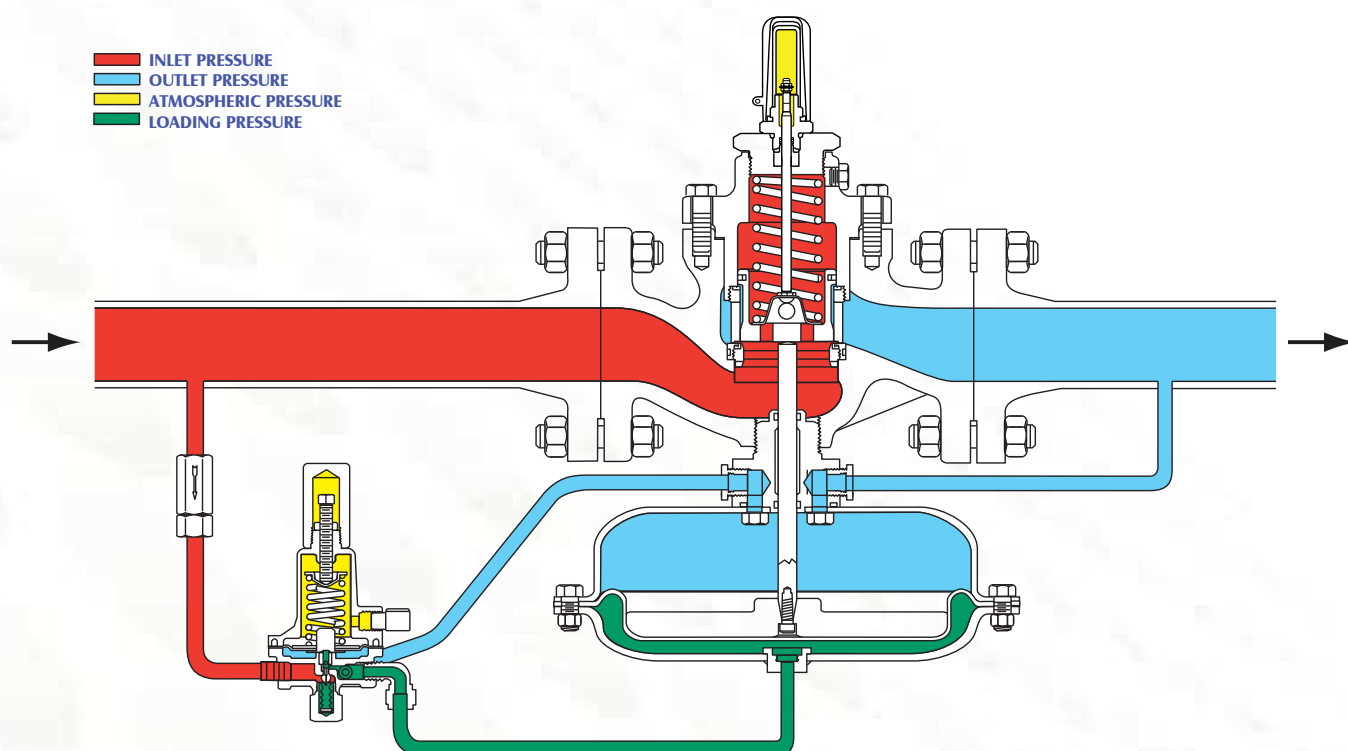
The Type ZN98 regulators are capable of providing accurate, fast response and high-capacities in low-pressure drop systems. Typical applications include: inert gas and plant air headers. Liquid Service, this type of regulator can be offered with anti noise and anti cavitation trim.

Body Size	NPS 1,2,3,4,6,8x6 and 12x6 / DN 25, 50, 80, 100,150, 200 x 150
Outlet Pressure Range	4in.w.c. to 300psig / 10 mbar to 20.7 bar
Maximum Inlet Pressure	400 psig / 27.6 bar
Maximum Capacity	11.331,000 SCFH / 303,671 Nm ³ /h
Operation Method	Pilot-Operated
Body Material	Cast Iron,Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar	*	*	*	*	*	*	TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
4 in. w.c. to 300 / 10 mbar to 20.7	*	*	*	*	*	*	ZN98-TGC	Pilot	1 to 12 x 6	400 / 27.6	11,934 gpm /45,170 l/min

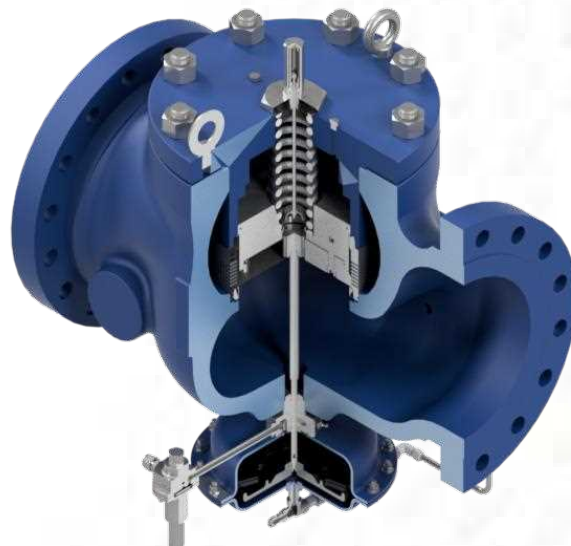


Back Pressure Regulator (Pilot-operated)

ZN98-TGC-Z3EG

Types ZN98-TGC-Z3EG pilot-operated relief valves or backpressure regulators are suitable for both liquid and gas service and may also be used for throttling backpressure applications, such as on oilfield separators. These relief valves are combined with the Z358 Series pilots to result in the configurations shown in the Specifications section.

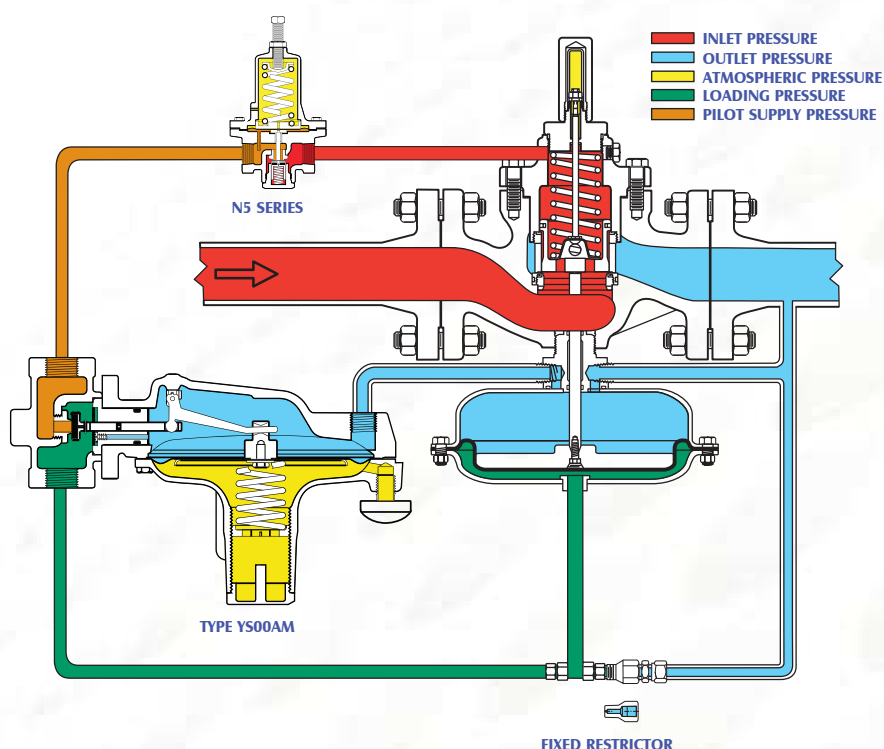
Body Size	NPS 1,2,3,4,6,8x6 and 12x6 / DN 25, 50, 80, 100,150, 200 x 150,300X150
Back pressure Control Range	10 to 400 psig / 0.69 to 27.6 bar
Maximum Inlet Pressure	400 psig / 27.6 bar
Maximum Capacity	8,795,000 SCFH / 235,706 Nm ³ /h
Operation Method	Pilot-Operated
Body Material	Cast Iron,Steel and Stainless Steel



INNOVATIVE FLUID MANAGEMENT TECHNOLOGY

Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
BACK PRESSURE CONTROL RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
10 to 400 / 0.69 to 27.6	*			*	*	*	ZN98- TGC-Z3EG	Pilot	1 to 6 and 12 x 6	400 / 27.6	8,795,000 / 235,706



Pressure Reducing Regulator (Direct-operated)

TZ05

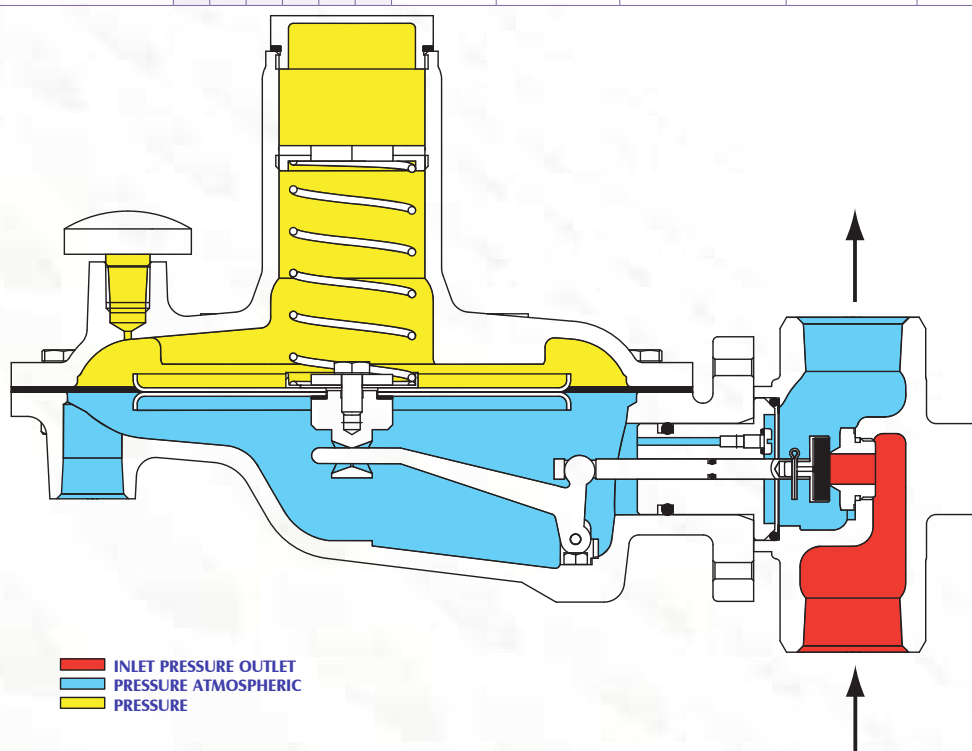
The TZ05 Series is a compact regulator idea for accurate control of low-pressure systems. The unit is easy to install and maintain. For larger applications the Type YZ92 is available in NPS 1-1/2 and 2 / DN 40 and 50 sizes.

Body Size	NPS 3/4 and 1 / DN 20 and 25
Outlet Pressure Range	1in.w.c. to 7psig / 2 mbar to 0.48 bar
Maximum Inlet Pressure	200 psig / 13.8 bar
Maximum Capacity	12919 SCFH / 346.2 Nm ³ /h
Operation Method	Direct-Operated
Body Material	Cast Iron,Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
1 in. w.c. to 7 / 2 mbar to 0.48	*	*	*	*	*	*	TZ05	Direct	3/4 and 1	200 / 13.8	12,919 / 346.2



Back Pressure Regulator (Direct-operated)

TZ08

The TZ08 Series is ideal for relief or back pressure applications in small systems. The unit may also be utilized as a vapor recovery valve. A larger NPS 1-1/2 and 2 / DN 40 and 50 unit is available in the Type Y296.

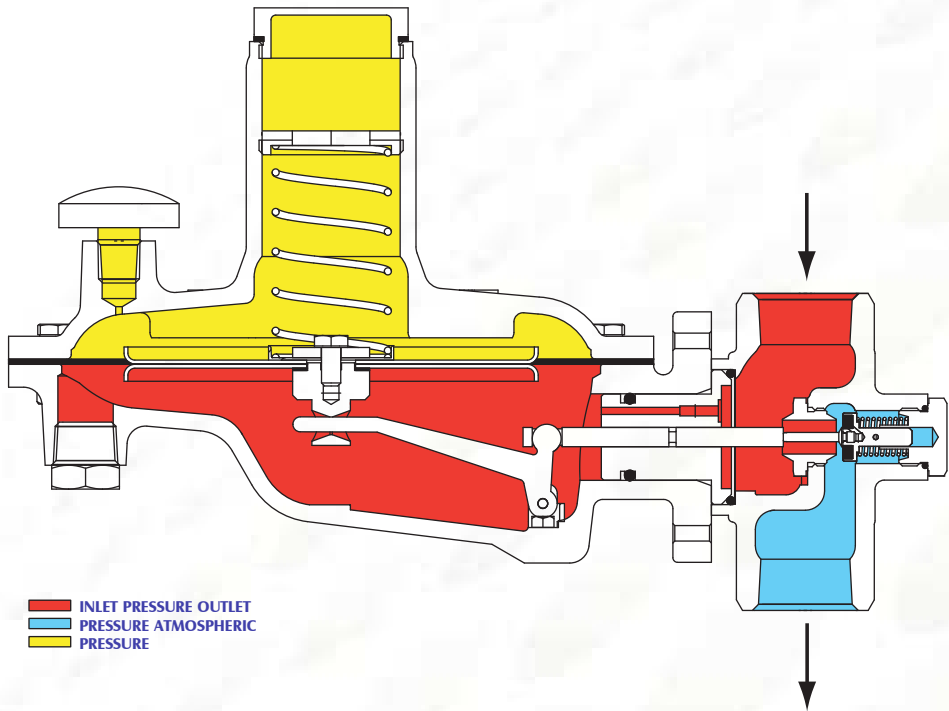
Body Size	NPS 3/4 and 1 / DN 20 and 25
Back pressure Control Range	2 in. w.c. to 7 psig / 5 mbar to 0.48 bar
Maximum Inlet Pressure	75 psig / 5.2 bar
Maximum Capacity	2286 SCFH / 61.3 Nm3/h of Nitrogen
Operation Method	Direct-Operated
Body Material	Cast Iron,Steel and Stainless Steel



INNOVATIVE FLUID MANAGEMENT TECHNOLOGY

Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
BACK PRESSURE CONTROL RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
2 in. w.c. to 7 / 5 mbar to 0.48	*	*	*	*	*	*	TZ08	Direct	3/4 and 1	75 / 5.2	2286 / 61.3



Pressure Reducing Regulator (Pilot-operated)

EF90

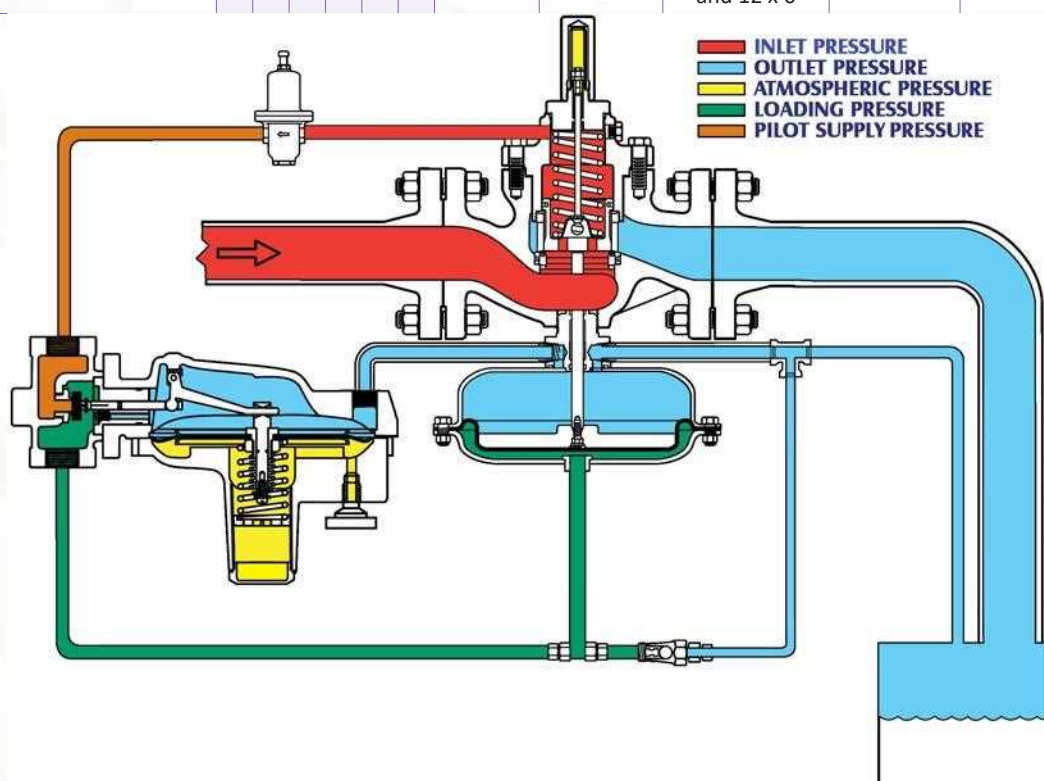
The Type EF90 provides very accurate pressure control on low-pressure blanketing systems. The regulator helps to control emissions and provides protection against any contamination from atmospheric conditions.

Body Size	1, 2, 3, 4, 6, 8 x 6 and 12 x 6
Outlet Pressure Range	0.25 in. wc to 7 / 0.6 mbar to 0.48
Maximum Inlet Pressure	400 / 27.6
Maximum Capacity	2,811,000 / 75,335
Operation Method	Pilot-Operated
Body Material	Cast Iron, Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm³/h
0.25 in. wc to 7 / 0.6 mbar to 0.48	*	*	*	*	*	*	EF90	Pilot	1, 2, 3, 4, 6, 8 x 6 and 12 x 6	400 / 27.6	2,811,000 / 75,335



Back Pressure Regulator (Pilot-operated)

ZF90

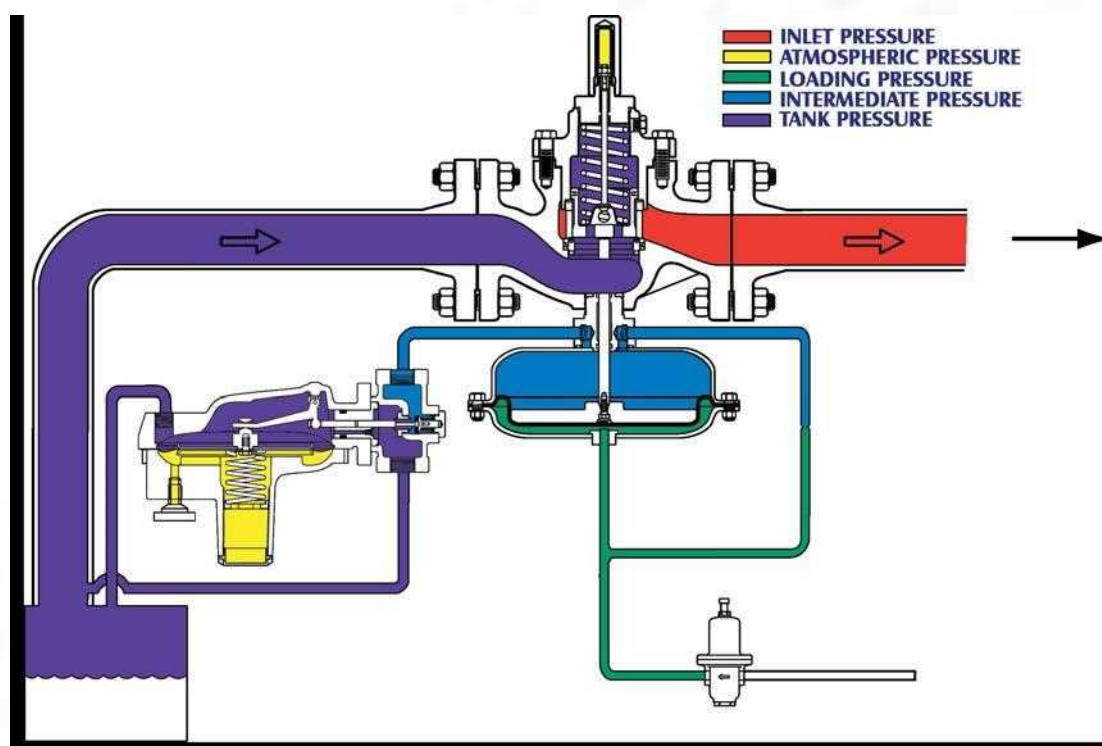
The Type ZF90 vapor recovery valve is a very accurate high-capacity which monitors the tank vapor pressure and opens when the tank pressure increases above the desired setpoint. The unit is ideal for use with vapor recovery systems because it is not affected by changes in pressure of the recovery system.

Body Size	1, 2, 3, 4, 6, 8 x 6 and 12 x 6
Back pressure Control Range	0.5 in. w.c. to 7 / 1 mbar to 0.48
Maximum Inlet Pressure	12.5 / 0.86
Maximum Capacity	327,400 / 8774
Operation Method	Pilot-Operated
Body Material	Cast Iron, Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
BACK PRESSURE CONTROL RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
0.5 in. w.c. to 7 / 1 mbar to 0.48	*	*	*	*	*	*	ZF90	Pilot	1, 2, 3, 4, 6, 8 x 6 and 12 x 6	12.5 / 0.86	327,400 / 8774



Pressure Reducing Regulator (Pilot-operated)

T5L

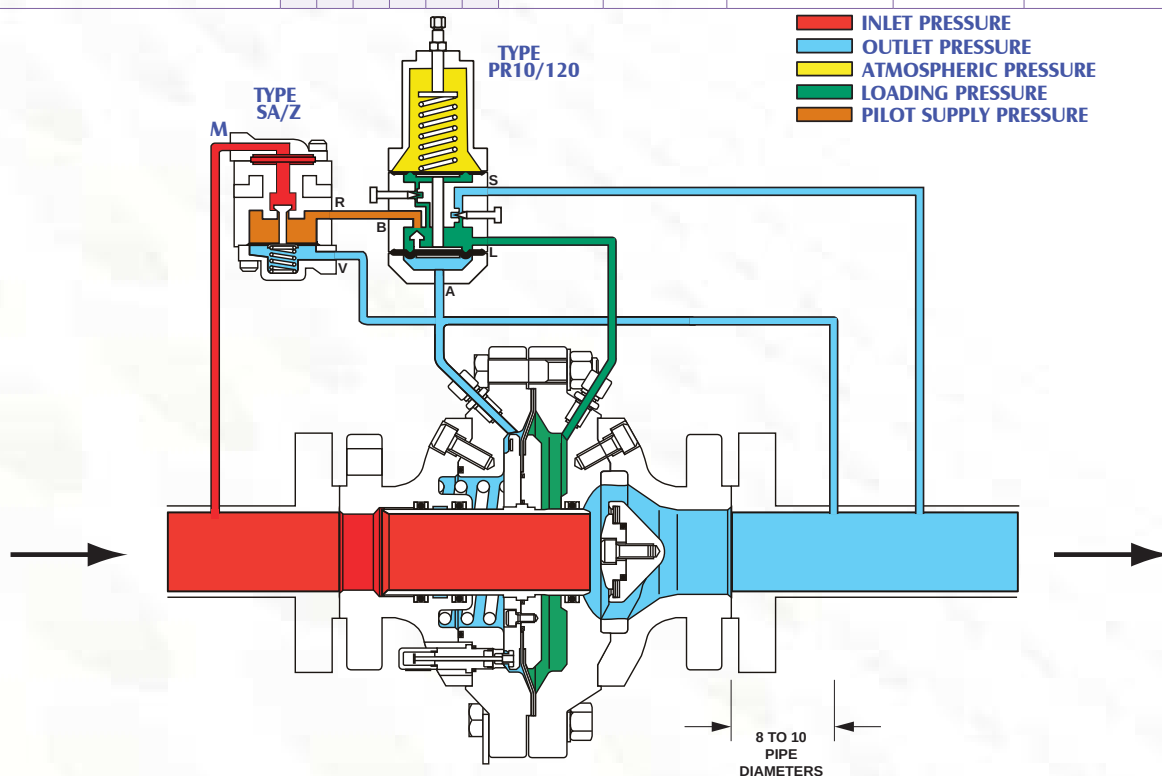
T5L is an accurate Axial Flow , pilot-operated regulator Noise attenuation designed for high-pressure transmission/city gate, large capacity distribution systems and power plant and other industrial plant feeds. T5L provides smooth and quiet operation, Tight shutoff and long service life. The regulator is comprised of a main valve actuator, a Type PR10 pressure reducing pilot and a Type SA/Z pilot supply pressure regulator.

Body Size	NPS 1, 2, 3, 4, 6, 8 and 10 / DN 25, 50, 80,100, 150, 200 and 250
Control Pressure Range	14.5 to 1160 psig / 1 to 80 bar
Maximum Inlet Pressure	1480 psig / 102 bar
Flow up to	100,535,000 SCFH / 2,694,000 Nm ³ /h
Operation Method	Pilot-Operated
Body Material	Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
14.5 to 1160 / 1 to 80	*				*	*	T5L	Pilot	NPS 1, 2, 3, 4, 6, 8 and 10	1480 / 102	100,535,000 / 2,694,000



Back Pressure Regulator (Pilot-operated)

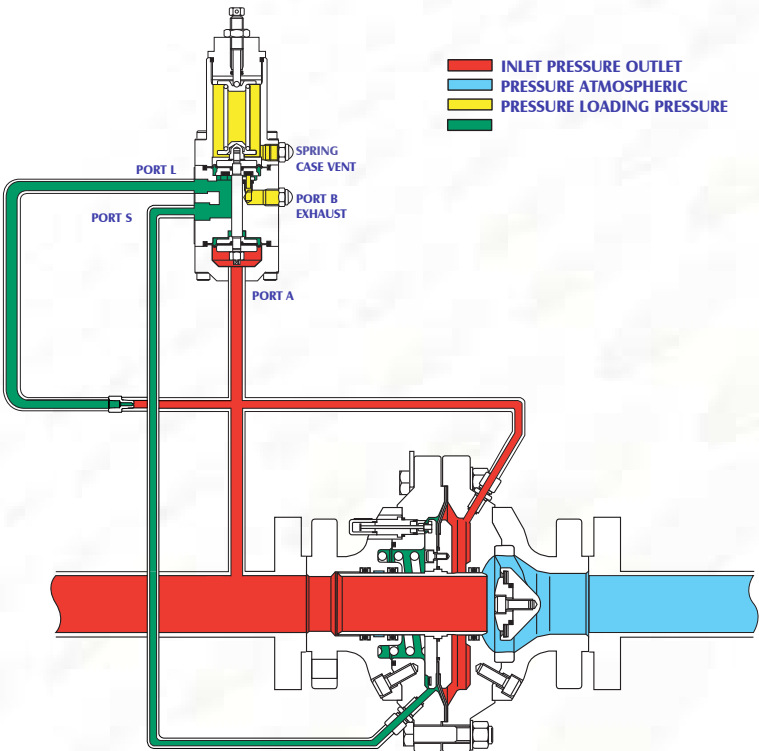
T5L-R

Type T5L relief valve or back pressure regulator is accurate, pilot-operated and designed for high-pressure transmission city gate, large capacity distribution systems and power plant feeds. Type FL provides smooth, tight shutoff and long service life. The relief valve or backpressure regulator utilizes a main valve actuator, a Type PR10/182 pressure reducing pilot. The regulator’s superior performance is due to the amplifying effect of the pilot and two-path control system. Changes in inlet pressure act quickly on the actuator



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
BACK PRESSURE CONTROL RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
29 to 1160 / 2 to 82	*				*	*	T5L-R	Pilot	1, 2, 3, 4, 6, 8 and 10	1480 / 102	74,442,000 / 1,995,000



Pressure Reducing Regulator (Pilot-operated)

N9

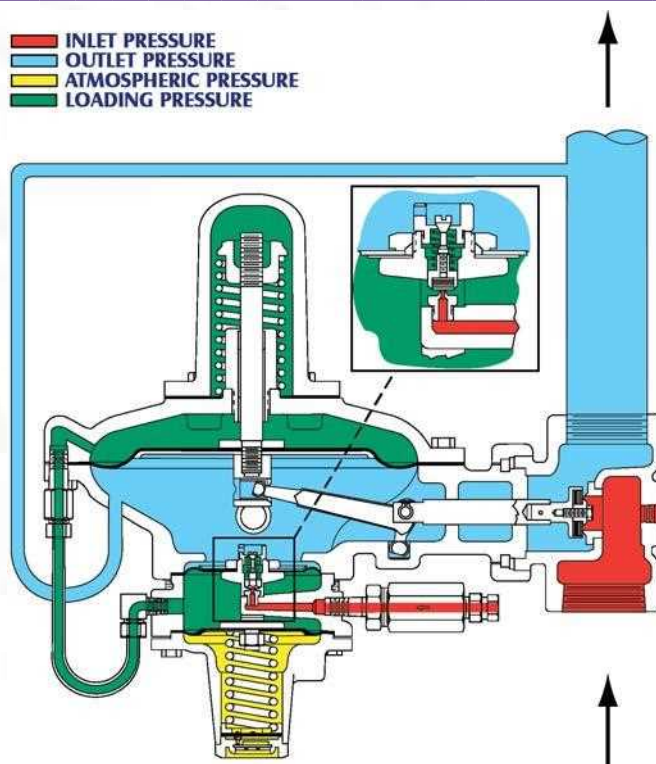
The Type N9 regulator is ideal for systems requiring accurate pressure control and fast response. Typical applications include fuel supply to industrial boiler, gas engines, furnaces, ovens, industrial burners and dryers.

Body Size	NPS 2 / DN 50
Control Pressure Range	2 in. w.c. to 100 psig / 5 m bar to 6.9 bar
Maximum Inlet Pressure	1000 psig / 69.0 bar
Flow up to	265,000 SCFH / 7102 Nm ³ /h
Operation Method	Pilot-Operated
Body Material	Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
2 in. w.c. to 100 / 5 mbar to 6.9	*	*	*	*	*	*	N9	Pilot	2	1000 / 69.0	265,000 / 7102



Pressure Regulator (Pilot-operated)

DE0A

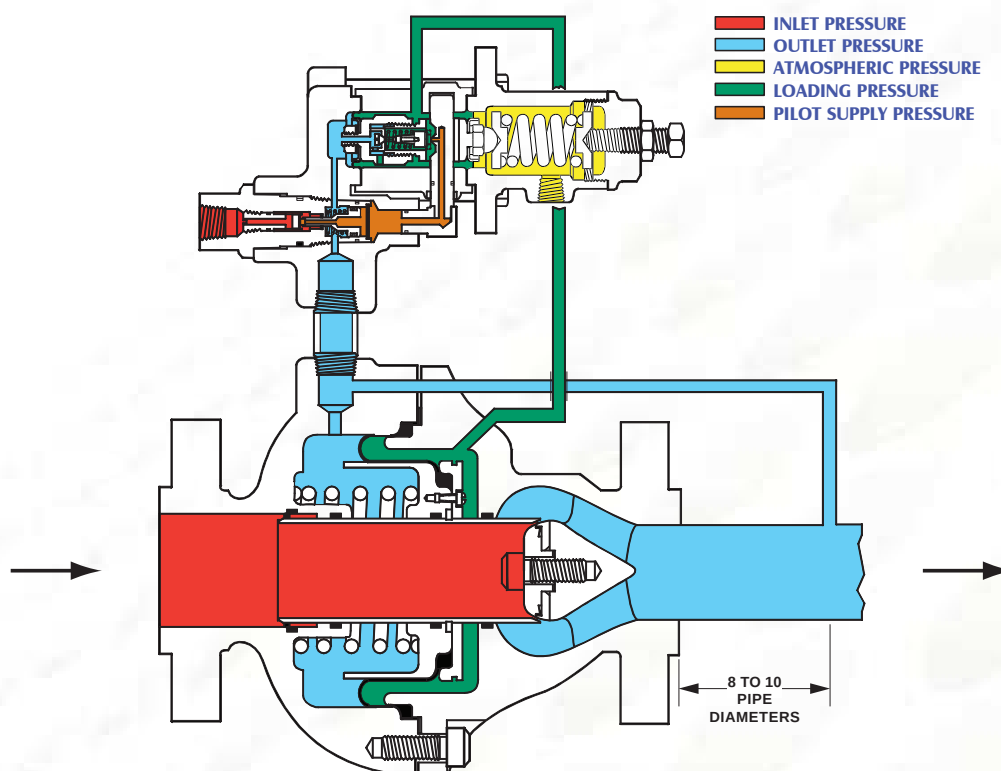
The Type DE0A pilot-operated high-pressure regulator is used where high capacity and accurate control are essential. This regulator includes one Type D2A pilot assembly mounted on the main valve for pressure reducing or wide-open monitoring applications or two Type D2A pilots mounted on the main valve for working monitor applications.

Body Size	NPS 1, 2, 3, 4 and 4x6 / DN 25, 50, 80, 100 and 100 x 150
Outlet Pressure Range	10 to 700 psig / 0.69 to 48.3 bar
Maximum Inlet Pressure	1500 psig / 103 bar
Maximum capacity	21,170,000 SCFH / 567,356 Nm ³ /h
Operation Method	Pilot-Operated
Body Material	WCB Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
10 to 700 / 0.69 to 48.3	*				*	*	DE0A	Pilot	1,2,3,4 and 4X6	1500 / 103	21,170,000 / 567,356



Pressure Reducing Regulator (Direct-operated)

Z30

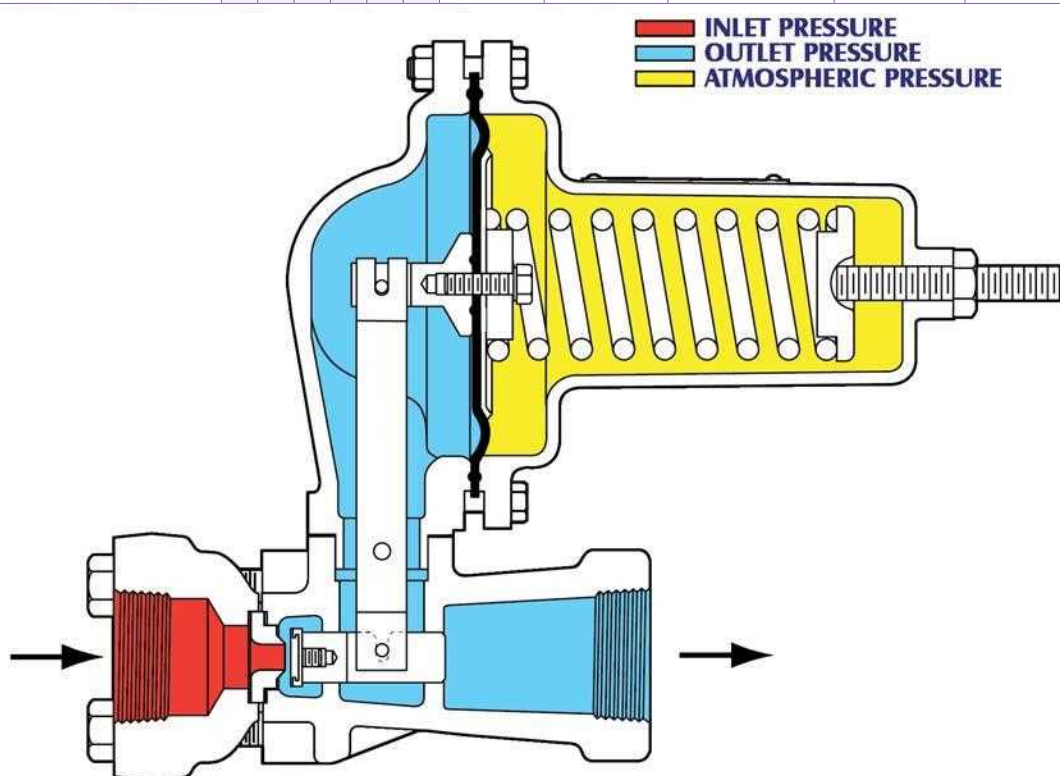
The Z30 Series direct-operated pressure reducing regulators are for low and high-pressure systems. Typical air applications include high-capacity air supply to large valve actuators.

Body Size	NPS 3/4, 1 and 2 / DN 20, 25 and 50
Control Pressure Range	3 to 500 psig / 0.21 to 34.5 bar
Maximum Inlet Pressure	1500 psig / 103 bar
Flow up to	162,000 SCFH / 4342 Nm ³ /h
Operation Method	Direct-Operated
Body Material	Ductile Iron, Steel and Stainless Steel



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
3 to 500 / 0.21 to 34.5	*				*	*	Z30	Direct	1 and 2	1500 / 103	130,000 / 3,484



Back Pressure Regulator (Direct-operated)

Z30-R

The Type Z30R is a general relief valve that is available in NPS 1 and 2 / DN 25 and 50 body sizes. It is frequently used at compressor stations, refineries and similar plants requiring a back pressure gas regulator for relief pressure settings up to 250 psig / 17.2 bar.

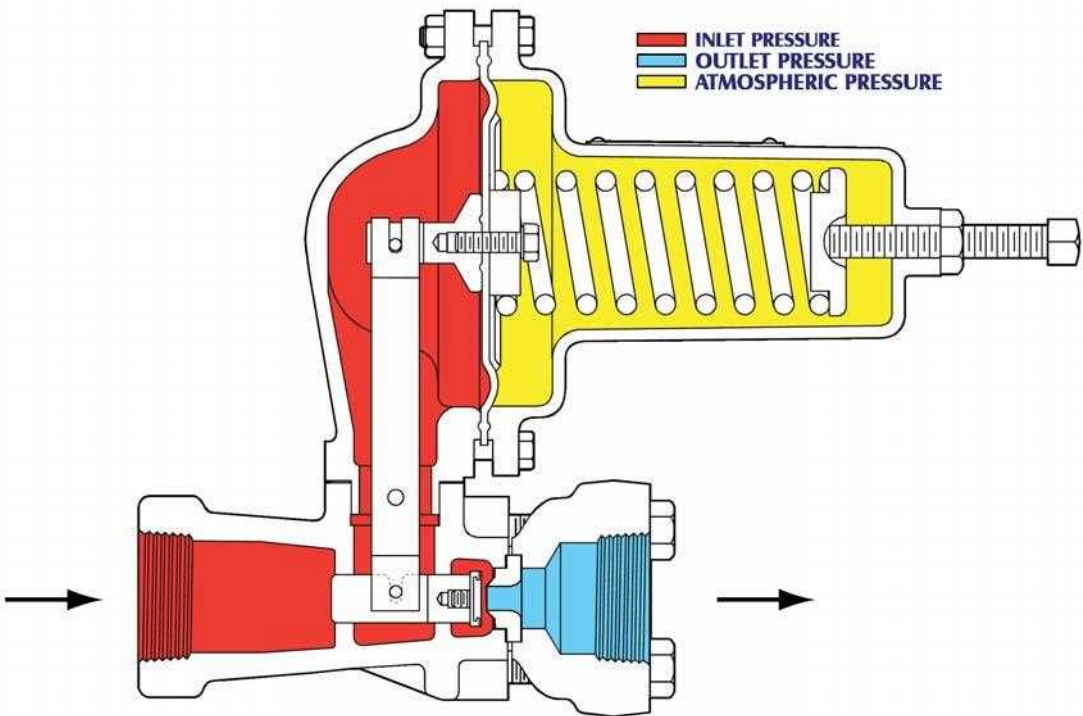
Body Size	NPS 3/4, 1 and 2 / DN 20, 25 and 50
Back pressure Control Range	3 to 250 psig / 10.3 to 17.2 bar
Maximum Inlet Pressure	550 psig / 37.9 bar
Maximum capacity	48,000 SCFH / 1,286 Nm3/h
Operation Method	Direct-Operated
Body Material	Ductile Iron, Steel and Stainless Steel



INNOVATIVE FLUID MANAGEMENT TECHNOLOGY

Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
BACK PRESSURE CONTROL RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
3 to 250 / 0.21 to 17.2	*				*	*	Z30-R	Direct	1 and 2	550 / 37.9	48,000 / 1286



Pressure Reducing Regulator (Direct-operated)

MN5R

The MN5R Series is a versatile, compact, high-capacity direct-operated regulator capable of solving the toughest pressure control applications. Typical applications include instrument

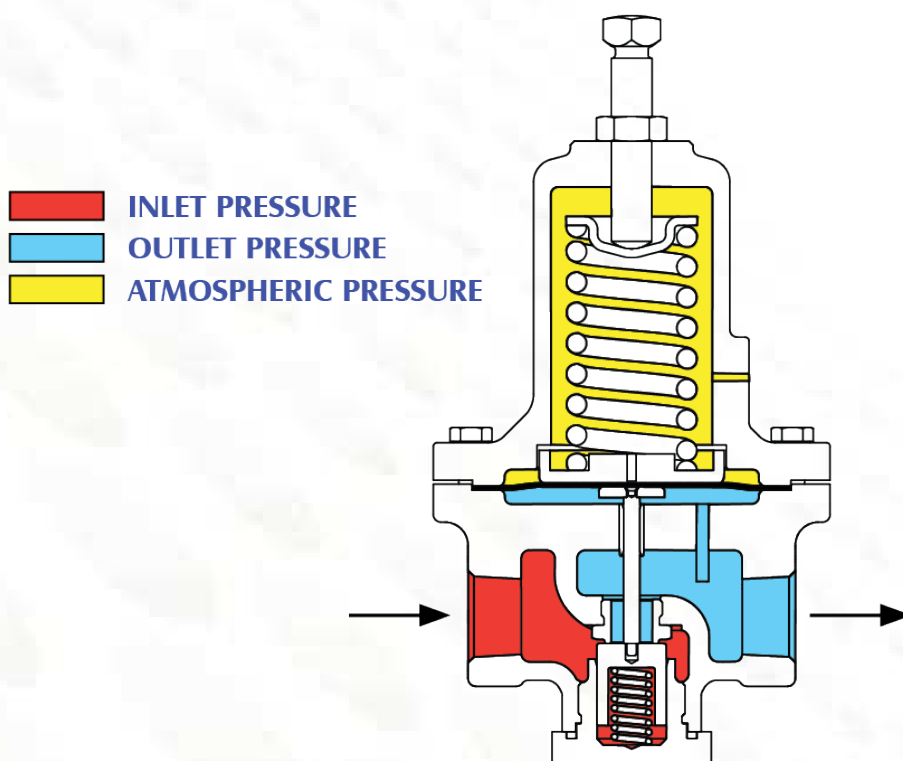
- * Air supply for large actuators, test fixtures and general pneumatic supply.
- * Fuel oil steam atomization, superheated steam, boiler feed water, steam tracing and sterilizers , fuel oil steam atomization, sea water,
- * Fire water systems and boiler feed water., oxygen systems, inert gas systems and corrosive gas service.

Body Size	NPS 1/4, 1/2, 3/4, 1, 1-1/2 and 2 / DN 15, 20, 25, 40 and 50
Control Pressure Range	2 to 400 psig / 0.14 to 27.6 bar
Maximum Inlet Pressure	1000 psig / 68.9 bar
Flow up to	510,000 SCFH / 13,668 Nm ³ /h
Operation Method	Direct-Operated
Body Material	Cast Iron, Steel, Stainless Steel, Hastelloy® C and Monel®



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
2 to 400 / 0.14 to 27.6	*	*	*	*	*	*	MN5R	Direct	1/4 to 2	1000 / 68.9	510,000 / 13,668



Back Pressure Regulator (Direct-operated)

MN8R

The MN8R Series is used in a variety of

- * process gas back pressure and relief applications including corrosive gases and cryogenic applications,
- * Liquid relief/back pressure applications, such as pump recirculation, lube oil skids, heating and cooling systems and process system.
- * Steam in power generation, heating and cooling systems and process system.

Body Size	NPS 3/4, 1 and 2 / DN 20, 25 and 50
Back pressure Control Range	2 to 375 / 0.14 to 25.9
Maximum Inlet Pressure	400 / 27.6
Maximum capacity	300 gpm /1150 l/min
Operation Method	Direct-Operated
Body Material	Cast Iron, Steel, Stainless Steel, Hastelloy® C and Monel®

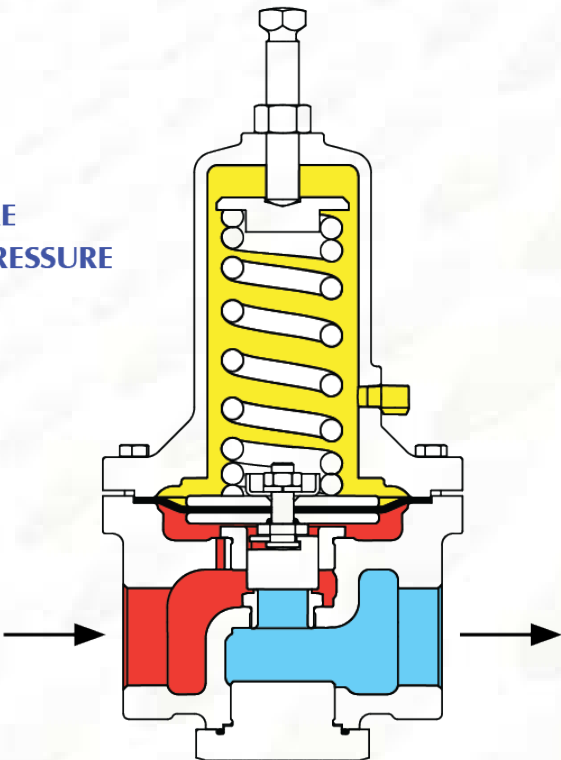


INNOVATIVE FLUID MANAGEMENT TECHNOLOGY

Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
BACK PRESSURE CONTROL RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm³/h
2 to 375 / 0.14 to 25.9	*	*	*	*	*	*	MN8R	Direct	1/4 to 2	400 / 27.6	300 gpm /1150 l/min

- INLET PRESSURE
- OUTLET PRESSURE
- ATMOSPHERIC PRESSURE



Back Pressure Regulator(Pilot-operated)

Z3EG

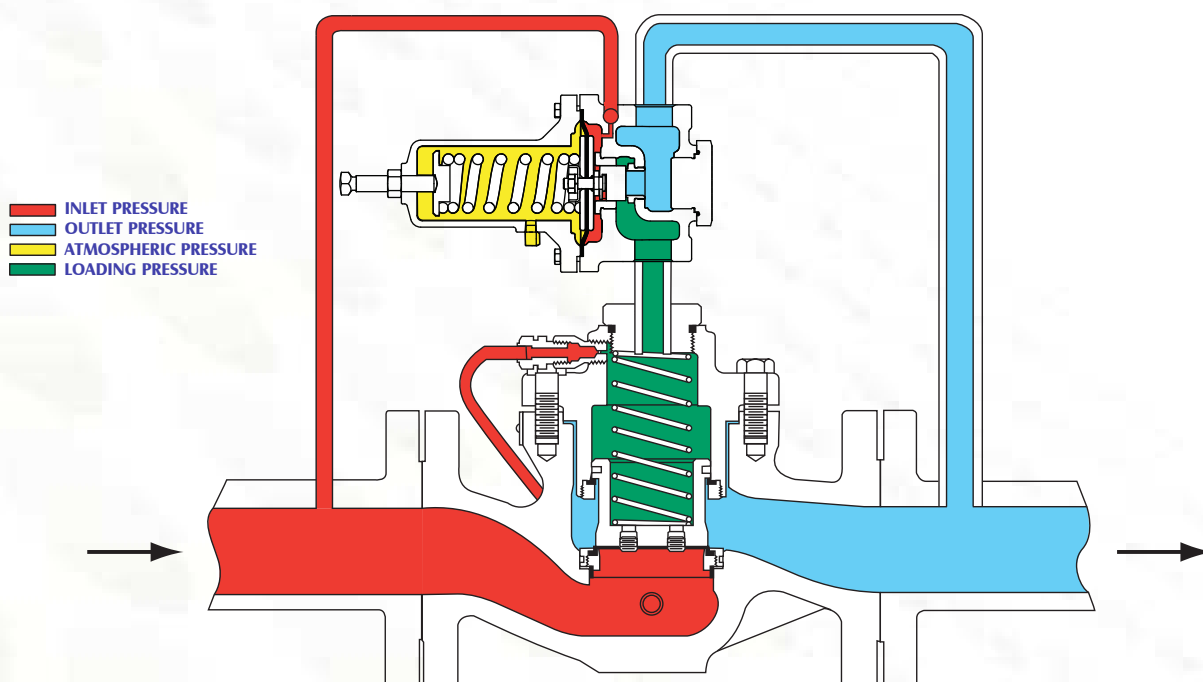
The Z3EG Series is a compact, fast response, high accuracy back pressure / relief valve which is suitable for gas or liquid service. The valve's design allows easy maintenance and is available with noise reducing trim.

Body Size	NPS 1, 2, 3, 4, 6 and 8 x 6 / DN 25, 50, 80, 100, 150 and 200 x 150
Back Pressure Control Range	10 to 400 psig / 0.69 to 27.6 bar
Maximum Inlet Pressure	400 psig / 27.6 bar
Flow up to	8,795,000 SCFH / 235,706 Nm ³ /h
Operation Method	Pilot-Operated



Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
BACK PRESSURE CONTROL RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
0.5 in. w.c. to 7 / 1 to 0.48	*				*	*	Z3EG	Pilot	NPS 1, 2, 3, 4, 6 and 8 x 6	400 / 27.6	8,795,000 / 235,706



Pressure Regulator (Direct-operated)

S7D

The S7D Series regulators are typically used to deliver constant reduced pressure of gaseous fluids to pilot-operated controllers and other pneumatic instrumentation.

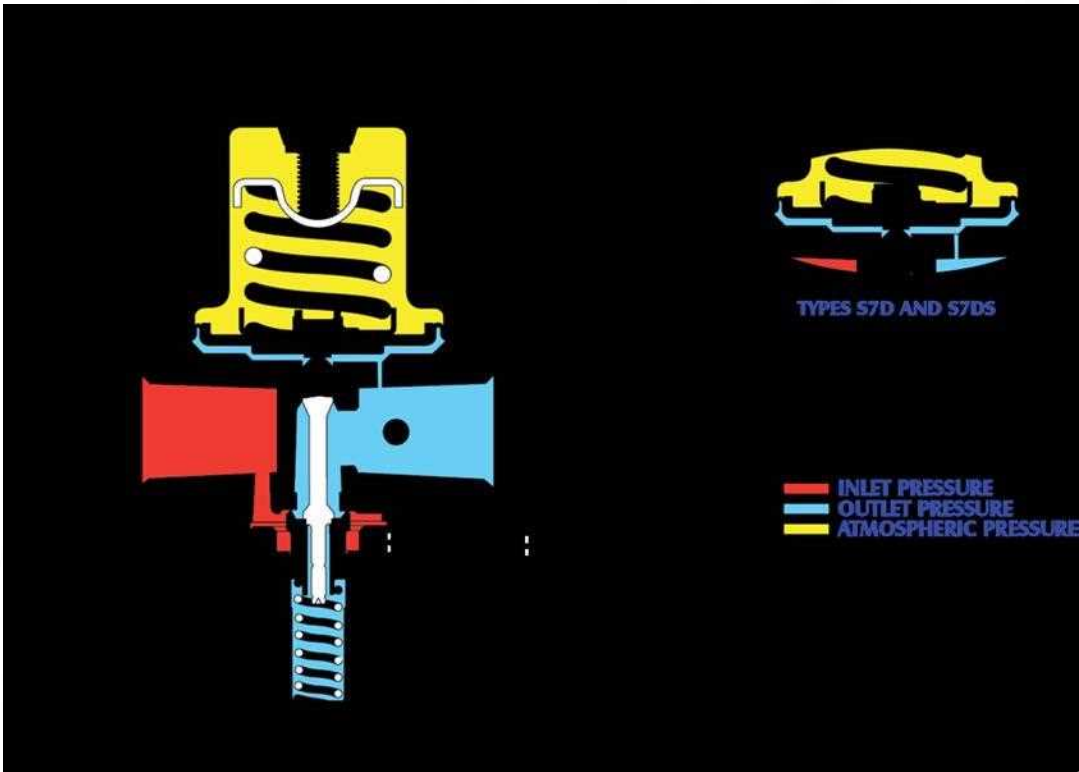
Body Size	NPS 1/2 / DN 15
Outlet Pressure Range	0 to 150 psig / 0 to 10.3 bar
Maximum Inlet Pressure	400 psig / 27.6 bar
Maximum capacity	20,900 SCFH / 560 Nm3/h
Operation Method	Direct-Operated
Body Material	Aluminum and Stainless Steel



INNOVATIVE FLUID MANAGEMENT TECHNOLOGY

Field of Application

	AIR	STEAM	TANK BLANKETING	LIQUID	PROCESS GAS	FUEL GAS					
OUTLET PRESSURE RANGE psig / bar							TYPE OR SERIES	OPERATION METHOD	BODY SIZE NPS	MAXIMUM INLET PRESSURE, psig / bar	MAXIMUM FLOW CAPACITY, SCFH / Nm ³ /h
0 to 150 / 0 to 10.3	*				*	*	S7D	Direct	NPS 1/2	400 / 27.6	20,900 / 560



GSSE TYPES OF CONTROL VALVES



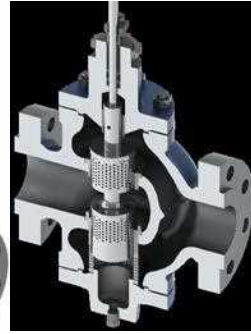
MF



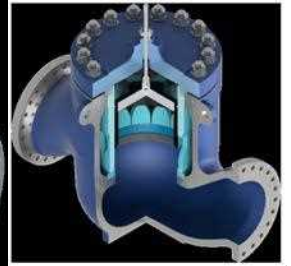
TG



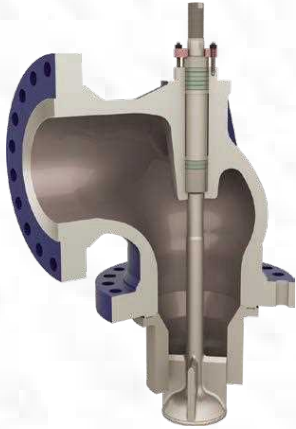
LG



DP



CG / VL



TD



HOV



LMF



SF



NABA



SB



RF



BFT



BFD



3 WAY



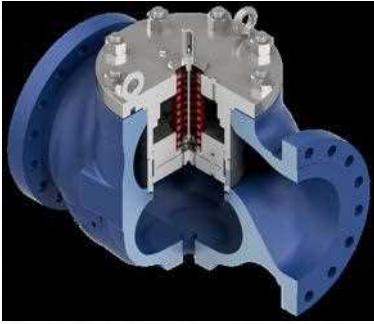
ARC VALVE

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



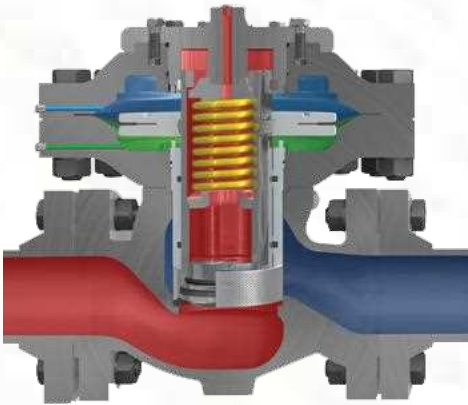
N2B



N2S



DE0A



E2H



T5L



ZN98-ZN TGC



MN5R



N9



Y-Z93



Z30

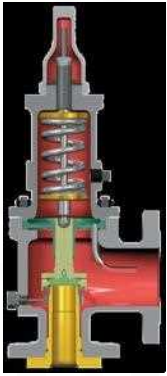
PRESSURE REGULATOR VALVES

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

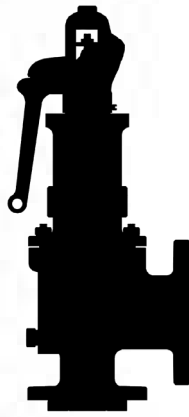
BACK PRESSURE REGULATOR AND RELIEF VALVES

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



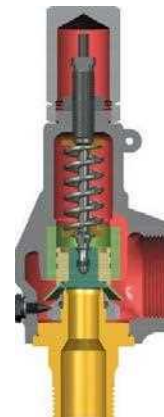
EN00-P



EN00-UM



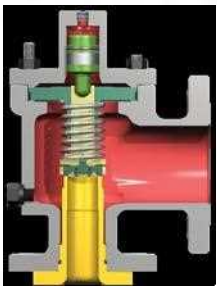
EN000



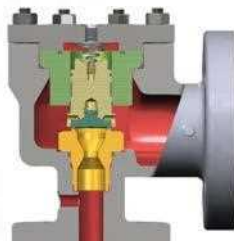
EN82



ZV82



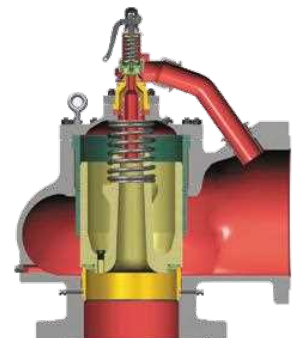
ZN00



DN00



VN00



EDN00



ES00



ZS00



EA11



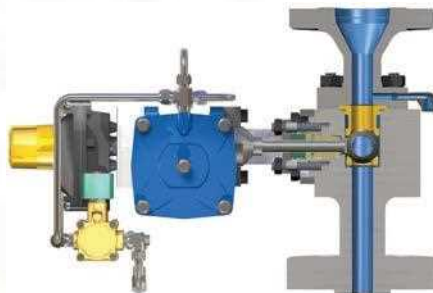
EF11



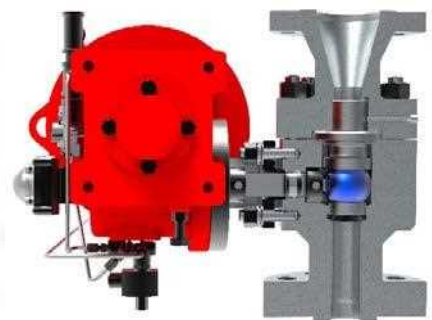
EF41-3



ZN00-40



DF00-5



DF00-B



VN20



VN10



VN20-A



GSSE MODLE SERIES	CONSTRUCTION			INLET SIZE		INLET RATING		OUTLET SIZE		OUTLET RATING		ORIFICE SIZES		SET PRESSURE RANGE		TEMPERATURE RANGE		ASME SEC I	ASME SEC VIII	
	CONVEN TIONAL	BELLOWES	PILOT	In		Psi		In		Psi		ORIFICE SIZES		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



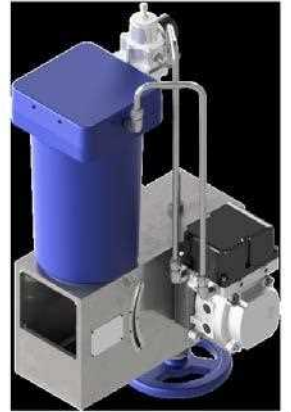
DM



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 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:

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. 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: +9821-85700022
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**

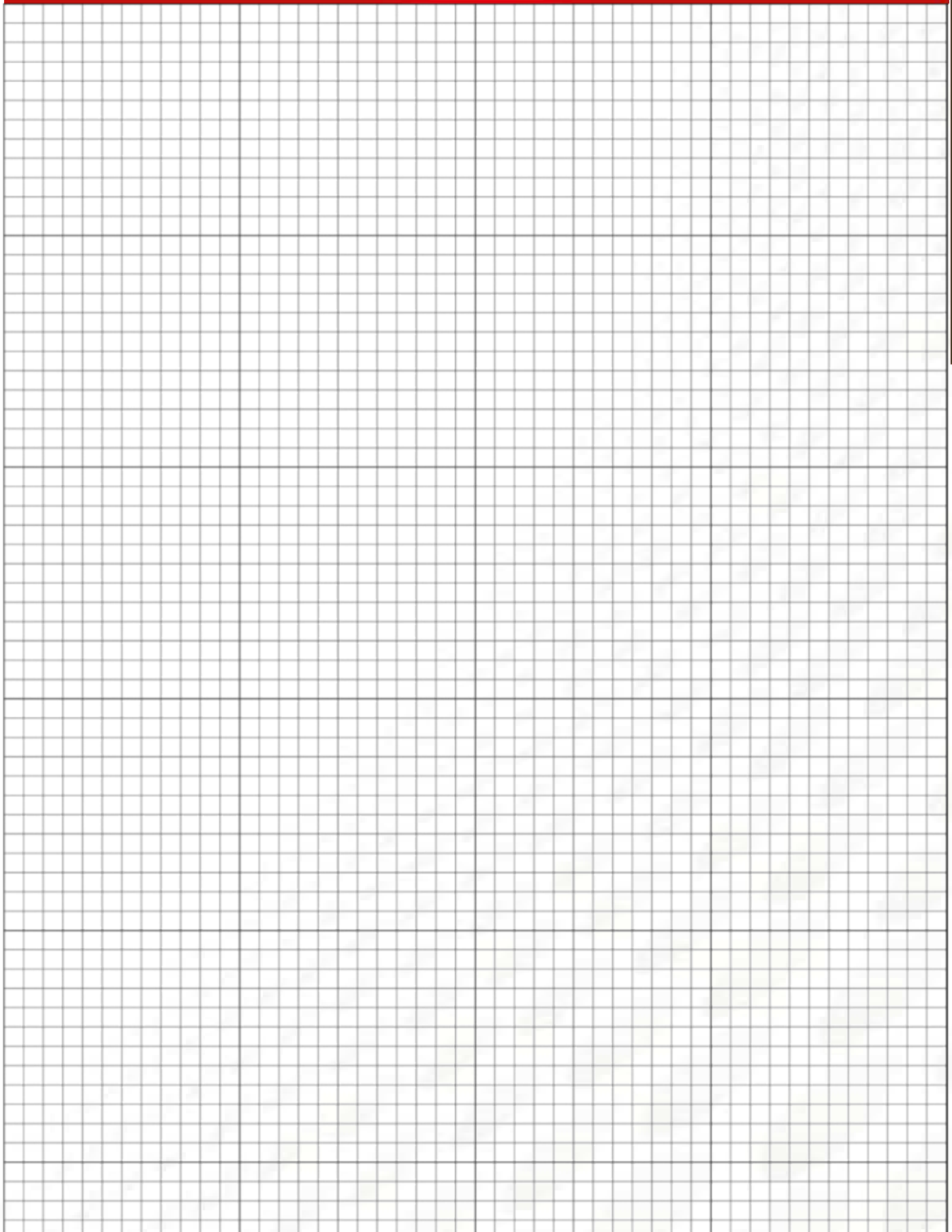
Product(s)	Specification	Reference Standard(s)/ Manufacturer Procedure
Globe Control Valve	Pressure Class 300: Up to Size 24" Pressure Class 900: Up to Size 20" Pressure Class 1500: Up to Size 3"	IEC 60534-1 January 2005, 3 rd Ed.
Butterfly Control Valve	Pressure Class 300: Up to Size 24" Pressure Class 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.

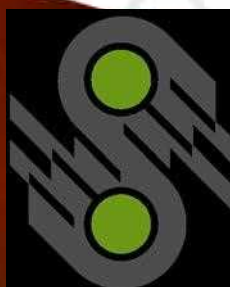
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CONTROL VALVE
PRESSURE REGULATOR
BACK PRESSURE VALVE
TANK BLANKETING
PRESSURE RELIEF VALVE
ACTUATORS

Iranian Knowledge Based Enterprise



No. 173, 13th Street, Oshtorjan
Industrial Town, Zobe Ahan Freeway,
Esfahan - IRAN



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