VYTALVAL

Designed in Germany,
Manufacturing in India

Engineering Excellence
Tailored To Your **Specifications**

VYTAL CONTROLS PVT. LTD.

www.vytalcontrols.com

COMPANY **OVERVIEW**

Vytal Controls, an ISO 9001:2015 certified company registered under Start-up India, supplies German-designed valves for critical and general service applications.

Our high-technology **control valves, desuperheaters, and turbine bypass valves** are renowned worldwide. Many products, installed over fifteen to twenty years ago, continue to operate with their original internals, showcasing our commitment to quality and design.

We adhere to international quality standards and the **Indian Government's ZED** (Zero Effect Zero Defect) benchmark, ensuring our products are defect-free and environmentally friendly. **Proudly, we are ZED certified.**

Our Mission

VYTAL, an ISO 9001 :2015 certified company is all set to develop an ultramodern testing unit and R&D department fit to match international quality standards. Our mission is to meet with the varied requirements of our clients on time and within their parameters.

VYTAL endeavour to deliver high quality industrial products that are free from defects and free from ill effects. We drive our resources to ensure that our products are carefully designed and manufactured as per the international quality standard so that we meet the ZED (Zero Defect Zero Effect) benchmark of Indian Government's holistic model. ZED certification is bestowed to companies that produce products that zero defects and zero ill effects on the environment.

Our Vision

VYTAL aims to be a global leader in industrial products having recognition from various National as well as International agencies. We visualize our company to be positioned in the industrial world as first choice of clients across globe for a whole wide gamut of quality products and services.

Safety, performance and value for money are parameters that we at VYTAL follow to deliver our solo goal of reaching each and every industrial demand across the globe.

Our Expertise

**VYTAL is a complete package of high end design, engineering and consultation.
Out expertise lies in implementing the product design in accordance with our client's customized requirements.
We endeavour to deliver our clients with best technical solutions that can help them stand the competition.**

• Manufacturing

VYTAL, a trusted company in the field of industrial valves has a state of art manufacturing unit with the most ultramodern technology and quality systems. Our production unit is managed by our experienced team that holds expertise in manufacturing for more than 20 years professionally supporting our company to match international production standards.

Our production processes involve a rigorous teamwork of our employees to combine ultra modern technology with design capabilities in building the most accurate customized designs and application experience.

• Customized Design

We follow German designs, a company meeting quality standards for over 45 years shipping high technology Licensed Products like control valves, de-super-heaters and turbine bypass valves to thousands of clients across globe.

We hold expertise in manufacturing products that are designed in accordance with bespoke requirements of our eminent clients. These makes our products operate satisfactorily with the original internals for several years giving evidence for reliability of quality and design ideas. It also ensures that our clients are benefitted from efficient performance of their plant with least maintenance and downtime.

• Research and Development

We at VYTAL have a dedicated team of engineers operational for churning out better ideas that can result in high performance of our products. Our team is involved in research in order to develop better technology to meet continuously changing engineering challenges and demands across the globe.

In order to keep pace with the ever changing engineering demands, we remain in constant touch with the new development of engineering products and technology across the globe so that we can ensure meeting high end international production levels.

• Quality Check

VYTAL emphasize on better quality for enduring performance of our products ensuring smooth production processes for our cleints. Quality checks being a vital parameter or our company's product capabilities, we at VYTAL have a separate quality control department that emphasize on meeting various international quality standards.

Our team at VYTAL have in-depth know how about international quality standards, various guiding agencies and quality testing parameters. We have a dedicated team for testing our products on various grounds to ensure vital energy and smooth process for industries.

• Compliance and Safety

With changing engineering demands and expectations, it is very vital to manufacture products that comply with the safety standards laid down by both the exporting and importing countries. We hold expertise in building products that meet all the parameters of industrial safety across the planet. We ensure that our client's units operate safely, reliably and efficiently giving them high performance advantage and acknowledgment.

• After Sales service

The after sales team at VYTAL has been persistently pursuing the strategy wherein our Customers are our priority building a convincing loyalty and responsibility relationship.

Our ever dedicated team of experienced engineers are always ready to serve our client with prompt and quality service regardless of the nature of the work and the ease of location.

We at VYTAL pursue a goal to support our clients in developing and maintaining work environment that is safe and reliable. Our clients across the globe are not only ahead with maximized performance but are always safe using our products.

PRODUCT RANGE

1. Bypass Valves / Systems.

2. Severe Service Control Valves

3. Desuperheaters

4. Automatic Recirculation Valves

5. Safety Relief Valves

6. Self-acting Pressure Reducing Valves

7. Reformer Valve

8. Pressure Reducing Station

9. Pressure Reducing cum Desuperheating Stations

10. Dump Tubes

BYPASS VALVES/ SYSTEMS

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View of various discs with different pressure reducing stages

Introduction:

Turbine bypass valves play a very major role in Power Plant applications. Within a short period of twenty four hours, a power plant may be required to operate at minimum load, increase to maximum capacity for major part of the day, immediately lower back to minimum load and then back to maximum capacity. Bypass System permit unit start up and shutdown in a lifesaving manner for critical heavy components in boiler and turbines. Bypass valves are supplied with hydraulic, electric or pneumatic actuators as per the process requirements alongwith complete control systems as an option.

Functions:

1. To perform quick and economic start up, including cold start, warm start and hot start in a lifesaving manner for critical heavy components in boiler and turbine.
2. To operate with the boiler shutdown.
3. To perform warm and hot startup in a short time after a trip i.e. brings the unit back to load.
4. To run the unit down to house load.
5. To perform real "two-shift' operation".
6. To avoid condensate losses to the atmosphere and reduce the start up noise to the ambient outside the plant.

BYPASS VALVES/ SYSTEMS

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Applications:

There are two different applications:

1. Bypass Systems which are occasionally in operation. Among these there are startup and shutdown conditions and emergency conditions, for example after turbine trip.
2. Bypass System which are often or permanently in operation, for example for process steam or heating application.

Actuators:

Bypass valves can be supplied with Pneumatic Piston & Cylinder, Electric or Hydraulic Actuators alongwith power pack and complete control system as per the requirements of the system.

Materials:

For most sizes, casting or forgings in Carbon and Alloy Steel can be supplied. For extremely large sizes, units are fabricated.

Bypass Valves are normally supplied with butt weld ends. However, if required can be supplied with flanged ends.

Multi - Stage Multi - Path Pressure Reduction trim technology:

1. The only reliable and proven long term solution for eliminating of noise, cavitation, flashing, vibration and erosion is to control velocity of fluid. Our Multi - Stage Multi - Path disc stack trim technology for successful operation of our valves in severe service conditions.
2. The fluid passes through an extremely tortuous path at right angle turns thereby reducing the fluid velocity and therefore reduces the noise and eliminates erosion and vibration problems. This trim design is tailor- made as per the requirements of customers.

BYPASS VALVES/ SYSTEMS

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High Pressure Bypass Valves

BYPASS VALVES/ SYSTEMS

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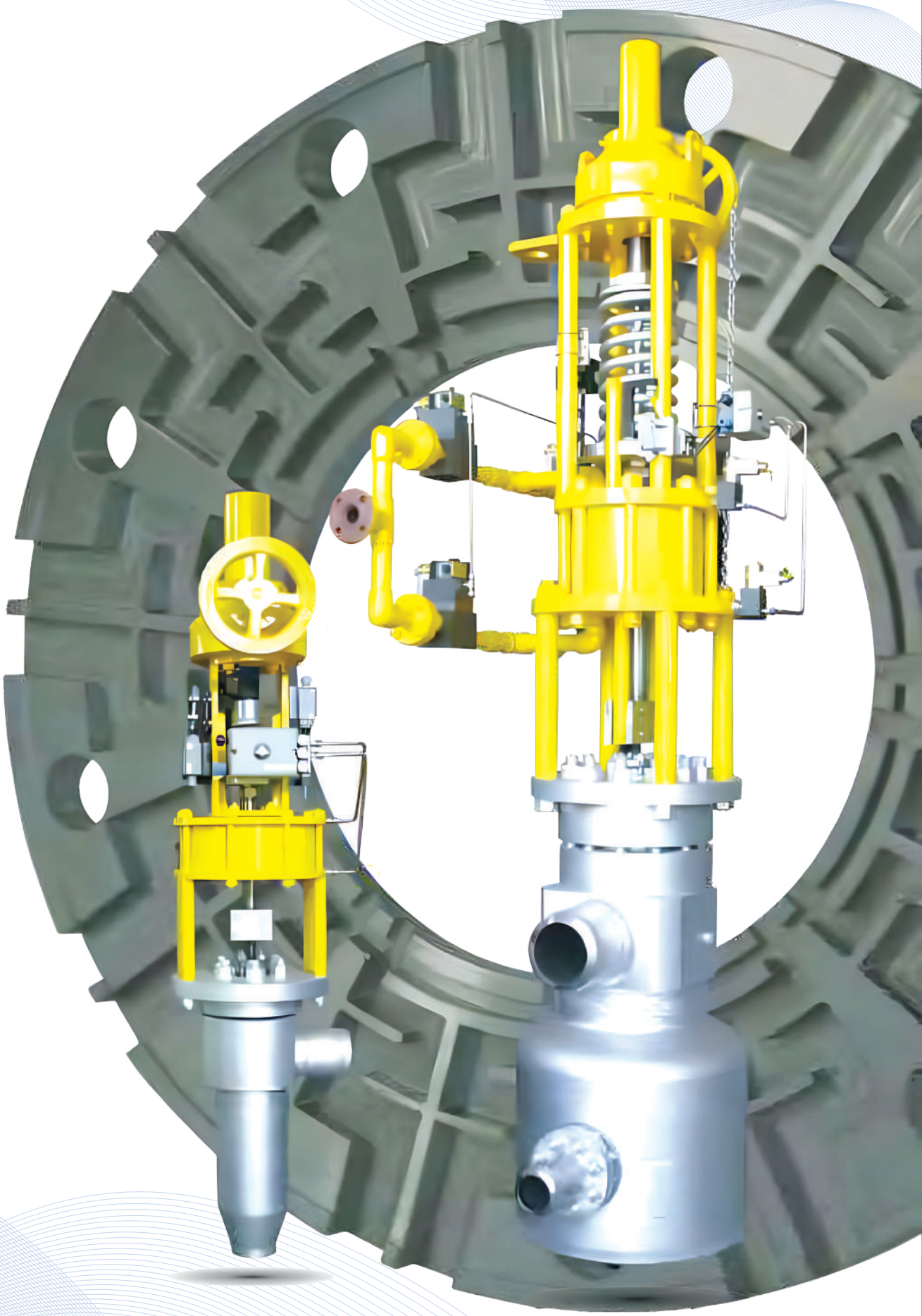

BYPASS VALVES/ SYSTEMS

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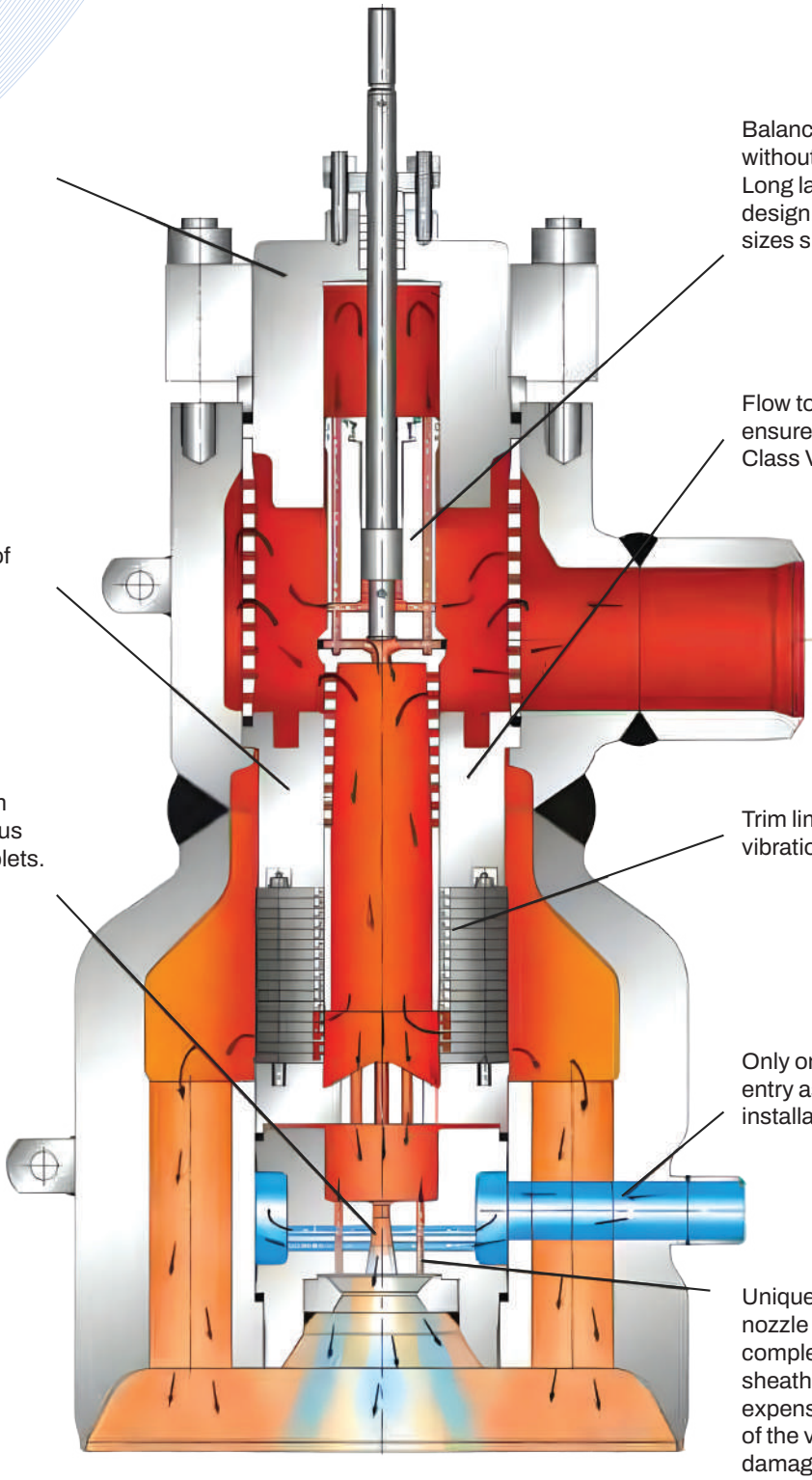
Bolted and pressurized bonnets depending upon applications.

Balancing plug and pilot stem without incorporating spring. Long lasting and trouble free design. Reduces actuator sizes significantly.

Flow to close seat design ensures tight shut off. Class V

Extremely maintenance friendly seat design.
No welding incorporated.
Complete trim can be replaced within a matter of few hours. .



Steam jet Laval nozzle creates supersonic steam velocities for instantaneous evaporation of water droplets. Maintains precise control over full operating range.

Trim limits velocity, erosion, vibration and noise.

Only one source of water entry assists in easy installations.

Unique concept of atomizing nozzle which forms a complete steam cover sheath. No need for expensive liners downstream of the valve and eliminates damages to downstream piping systems.

DETAILED VIEW OF TURBINE BYPASS VALVE

CONTROL VALVES

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Pneumatic Control Valves

VYTAL 11000 series & 12000 series pneumatically operated globe valves are designed for process control of high/low pressure steam, clean city, Clean Water, corrosive liquid and gases. They are available in sizes ranging from 1/2" to 20" in pressure classes 150 through 2500.

Control valves are supplied with either piston cylinder or spring and diaphragm actuator (direct or reverse acting) and a number of optional accessories to suit the duty requirement. These valves permit field interchangeability of actuator and trim types, thus proving to be economical in case of field conversion

In continuation to VYTAL traditional success in process control application, 11000 series & 12000 series provides optimum solution to the needs of the Fertilizer, Petrochemical, Refinery, Chemical, Power, and other process industries.

Body:
Variety of standard (reversible) body material are available to suit the duty conditions. they are Cast Steel (A 216 WCB) Stainless Steel (A 351 CF 8/8 M) Chrome-Molly (A 217 WC1 ,6 & 9), Hastelloy (A 494), Monel (A 296) or ALLOY 20 (A 351 GR CN 7M).The body and bonnet are built as per ANSI standard. The extra wall thickness provide strength and corrosion allowance.

Bonnet:
VYTAL control valves are fitted with different types of bonnet. for general applications, plain standard bonnet are incorporated, In order to protect the packing gland from extreme cold, in case of cryogenic service, extended bonnet can be fitted.

Trim:
The trim being responsible for the control of fluid process, is the most important assembly of control valve. It is expected to give long trouble free operation without a damage, owing to wire drawing, cavitation, vibration (noise). At the same time, the selection of proper trim characteristic is equally responsible to get the desired performance. VYTAL offers variety of trim options depending on the application. They are modified Parabolic, Linear, Quick Acting or Equal Percentage. Standard trim components like plug, seat, cage/Retainer and cylinders are 410/420 (hardened) SS Alloys, Optional materials are Stellited.

Packing:
Regular packing material are PTFE & Grafail. However, for most applications like steam and other hazardous fluids, Grafail (pure graphite) is recommended by VYTAL. Grafail contains no resins/binders or fillers and offers outstanding high temperature characteristics.

Actuators:
VYTAL has Varietier of actuators like single acting spring & Diaphragm actuators with single spring / Multi spring (Direct / Reverse type), double acting piston & cylinder actuators to meet all requirement of thrust & stroke length.

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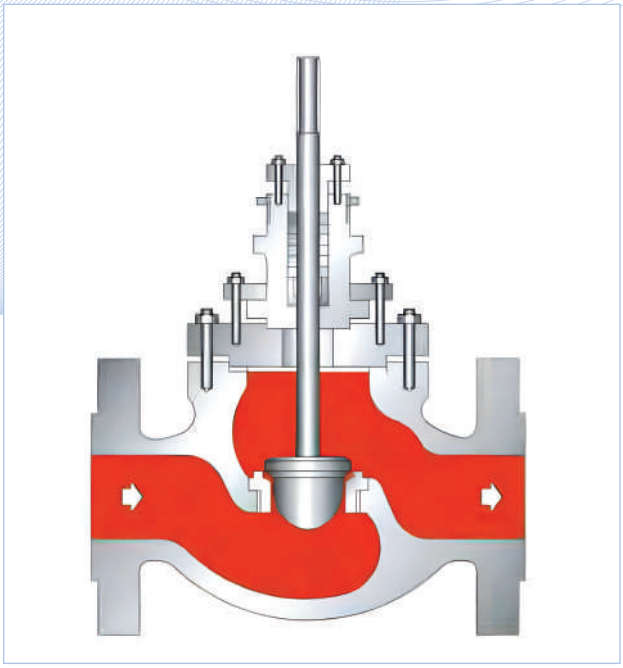

Single Seated Valve

This globe type single seated valve has a top guided plug with a suitable type of actuator, air action (from "air to close to air to open") can be reversed at site, this type of valve is generally used when tight seal is required.

At fully closed position (shutoff corresponding to ANSI B16.104 #V). With the PTFE soft insert, even "bubble-tight" shutoff can be achieved. Heavy stem guiding provides rigidity, thereby eliminating the possibility of vibration. Different trim options are available to suit the duty conditions.

Type	:	Single seated, Straight Through
Material	:	Carbon steel, Stainless steel or Other Alloys
Sizes	:	1 " through 20"
Cv	:	up to 2500.
End Connections	:	Flanged/SW
Ratings	:	150# through 2500#
Actuator	:	VYTAL Piston cylinder or spring and diaphragm
Trim	:	Contoured, Low Noise, Anti - Cavitation
Characteristics	:	Modified Parabolic, Equal % Linear, on-off

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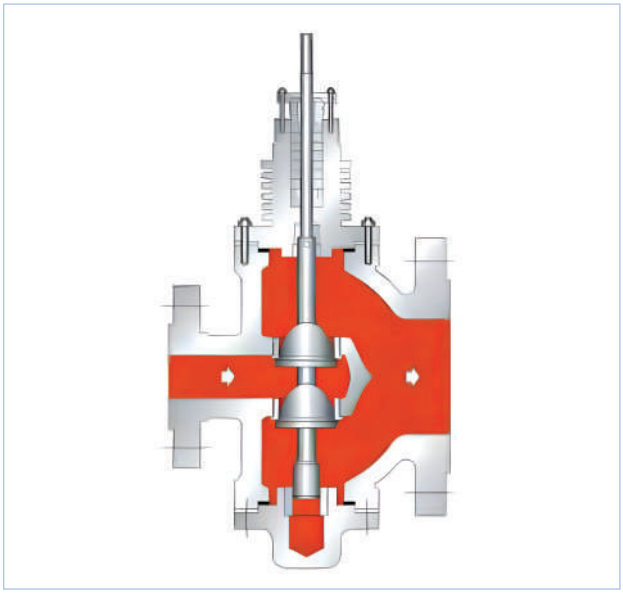
Double Seated Valve

This valve achieves practically balanced fluid thrust on the plug and is suitable for use with high differential pressures at shut-off.

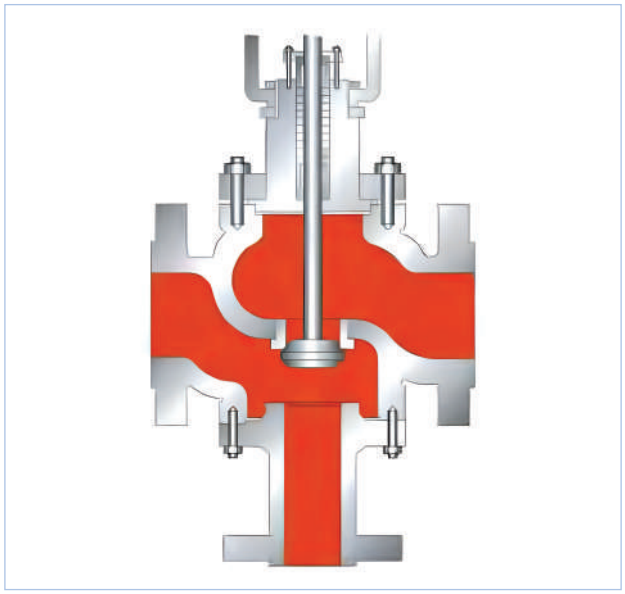
It can be used with smaller actuators than those required for single seated valve. This series of valve may be used in flow regulation because of its higher Cv valve compared to that of a single seated valve. However, its seal is limited to ANSI B 16. 104 class Ill at shut off. This limitation is inherent in the design itself because it is hardly likely for the two plugs to simultaneously match with the seating on both ports.



Type	: Double seated, Straight Through
Material	: Carbon Steel, Stainless Steel or Other Alloys.
Sizes	: 1½" through 12"
Cv	: 14 through 2100.
End Connections	: Flanged
Ratings	: 150#through 1500#
Actuator	: VYTAL Piston Cylinder or spring And diaphragm
Trim	: Countoured
Characteristics	: Modified Parabolic, Equal %, Linear, On-Off

Three -way Diverting Valve

This valve is especially suitable for divergent service when a fluid is to be mixed in variable proportions, but it may also be used for convergent service. The valve can perform the function of two single seated valves acting in opposite direction. The main applications include circulation of water, thermic fluid, oil, sea water in heating or cooling application involving heat exchanger bypass control, blending and on-off selector system.



Type	: Three-way
Material	: Carbon Steel, Stainless Steel or Other Alloys
Sizes	: 1" through 6"
End Connections	: Flanged
Ratings	: 150# through 600#
Actuator	: VYTAL Piston cylinder or spring and diaphragm

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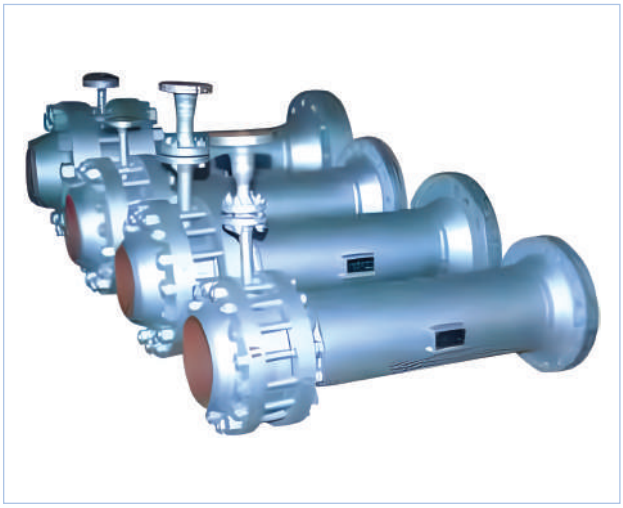
Venturi and Double Venturi Desuperheaterers

VYTAL Venturi desuperheaters consist of a De Laval nozzle which utilises a part of the incoming steam flow to create a reduced pressure zone into which spray water is drawn and atomised by steam energy, and then exits in a short expanding throat which allows pressure recovery.

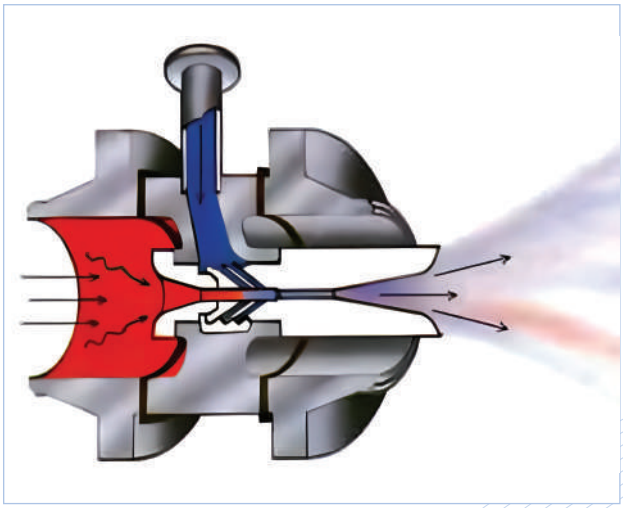
The desuperheating performance remains constant at all loads from 100% or less, because of the atomising steam effect of the steam jet. The design is unique such that the spray water can be supplied at the same pressure as that of the steam pressure. High turndowns are possible depending upon installations.

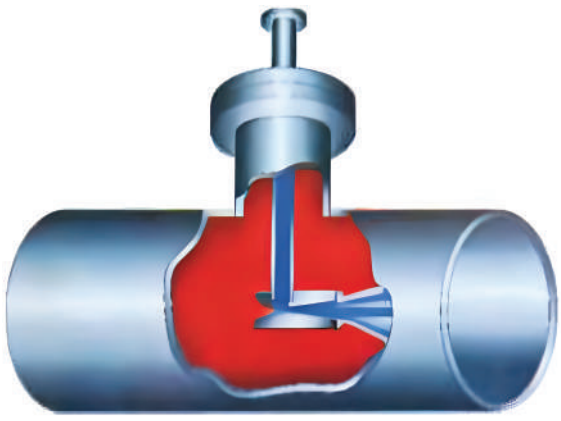


Attemperator

This special case of venturi without the venturi tail can be mounted easily and quickly in the existing pipeline. The unit can be clamped between two flanges. Suitable for use where lower pressure drop is required and little flow variations is encountered. Sizes are between 11 /2" to 30"

Sizes	: 2" to 30"
Rangeability	: 6 : 1 for single venturi type and 12 : 1 for double venturi.
Rating	: upto ANSI 2500#
Superior Water pressure	: Cooling water can be fed at steam operating pressure.

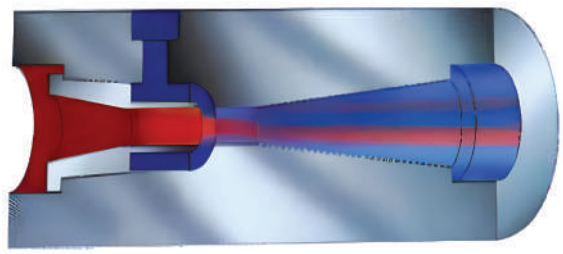




Cross section of In-line Venturi

In - Line Venturi

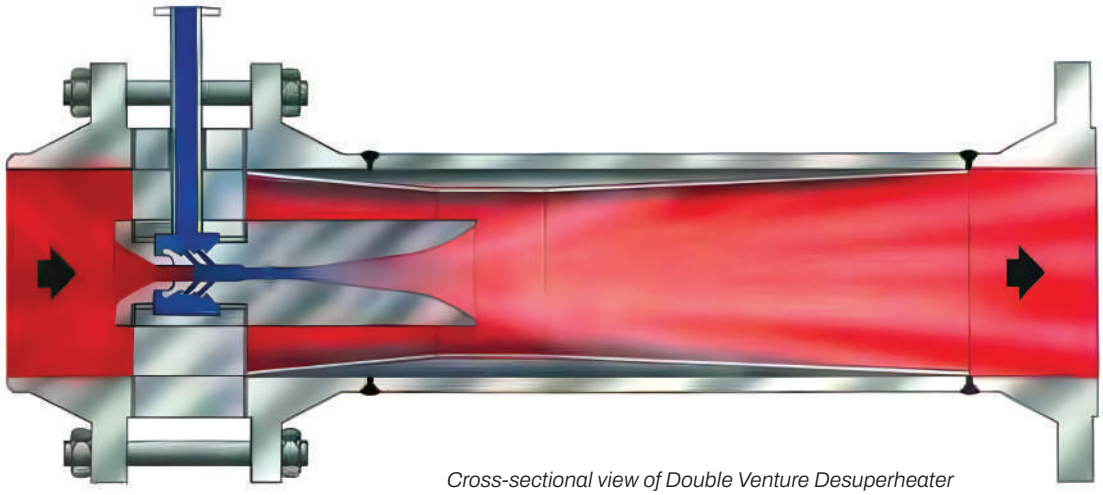
A version of single venturi desuperheater has the same operating conditions. Specially employed on large flow applications where pipe sizes are between (16" to 40")



Cross section of Mini Venturi

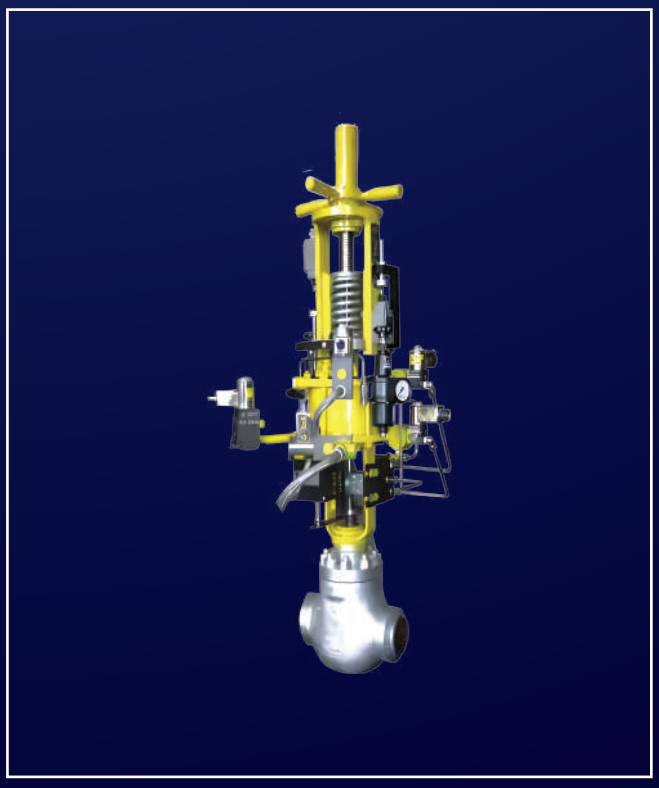
Mini Venturi

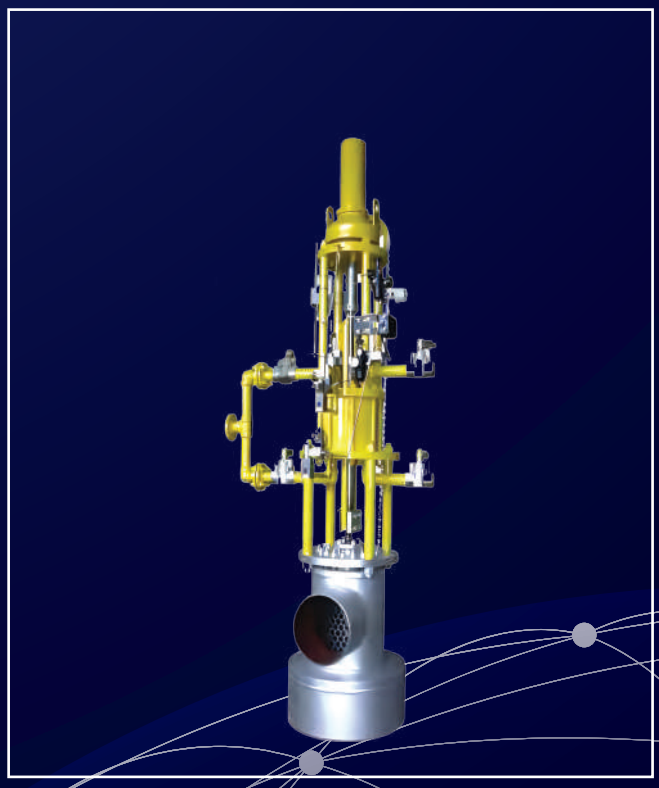
Available in sizes 1/2" to 11/2", suitable for use in very low flow applications. The unit can be supplied in either screwed or socket welded connections.



Cross-sectional view of Double Venture Desuperheater

Committed to **Bring World Class Technology** to The **Indian Market**





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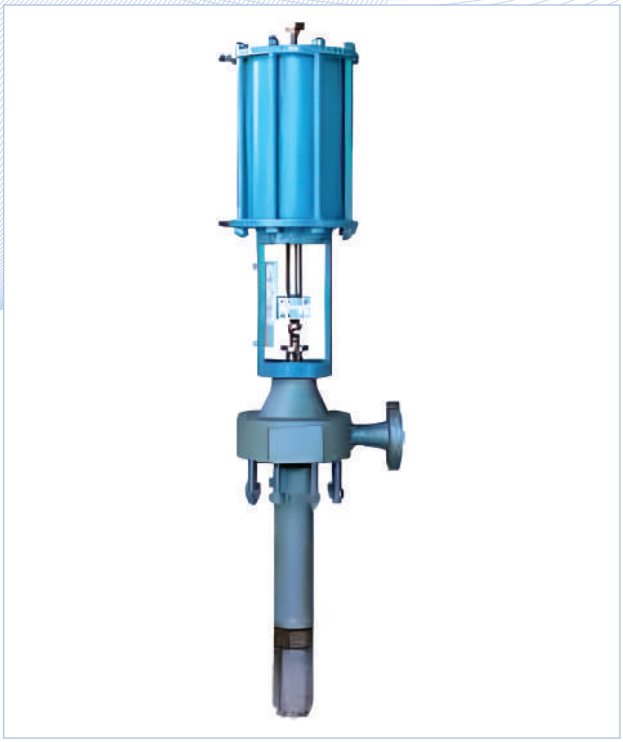

Lancer Multinozzle Desuperheater

Detailed view of nozzle arrangement in assembled condition

Internals

Multi Nozzale (Orifice) Lancer Desuperheater

VYTAL Multi orifice lancer desuperheater regulates the amount of injected water by varying the number of orifices during operation.

This ensures that the spray water pressure remains constant at all loads and an excellent and almost uniform spray quality is achieved over the full operating range, thereby minimising the tendency of spray water to accumulate in the steam line.

Opening of the orifices is regulated by the positioning of a piston operated actuator directly mounted on the desuperheater. This compact and simple design ensures no separate spray water injection control valve is required.

A high turndown of 50 : 1 is standard. Higher turndowns Can be accommodated on request.

Sizes	:	Mounting of the desuperheater in the steam piping of size 6" onward (regardless of pipe is always 4" and 1" (or 2") for water inlet.
Rangeability	:	350 : 1 can be accommodated
Rating	:	Upto ANSI 2500#
Superior Water	:	5 bar above the line pressure OR high pressure BFW.
Actuator	:	VYTAL Piston cylinder or spring and diaphragm
Flow Characteristics	:	Modified, Equal %, Linear

AUTOMATIC RECIRCULATION VALVES

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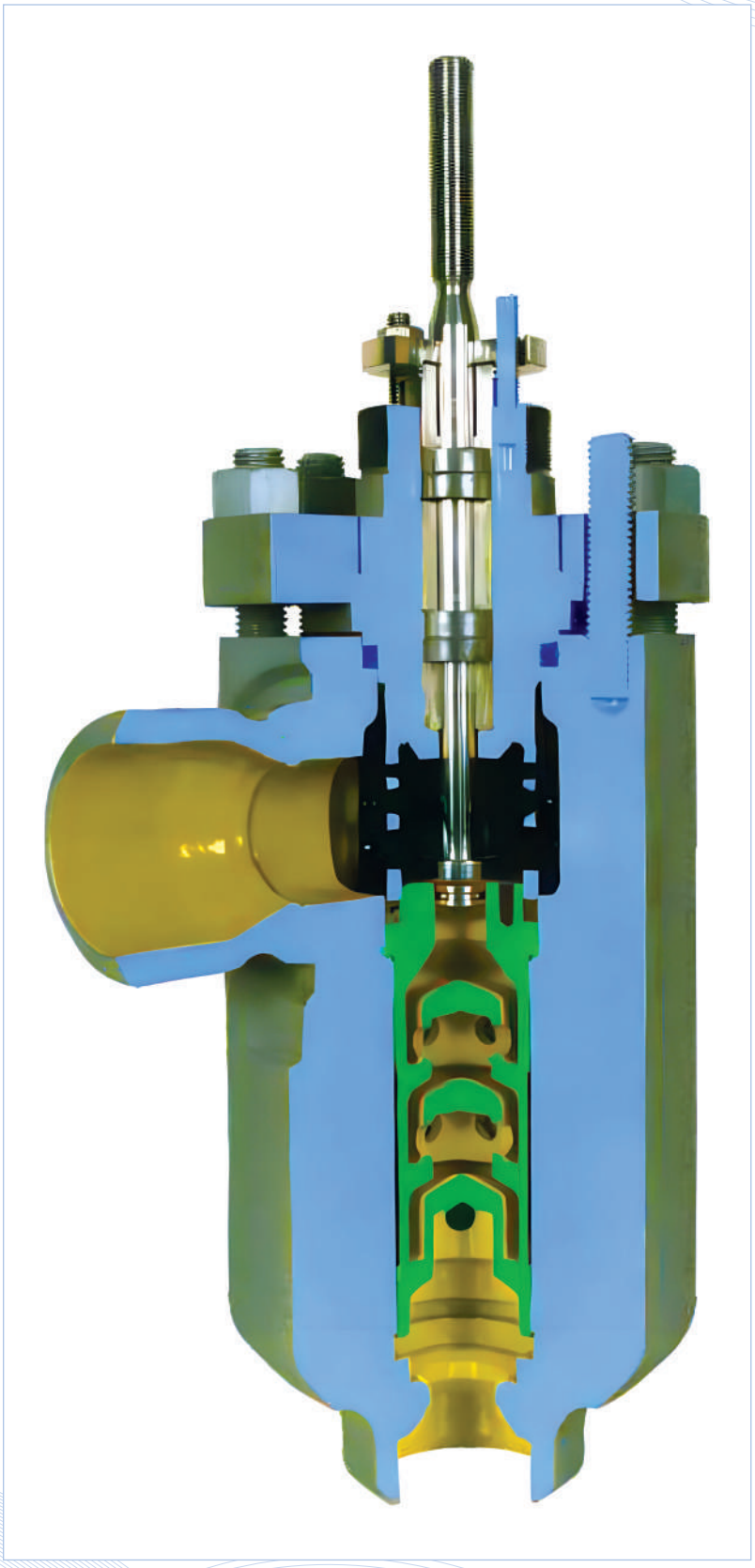

Cut section view

VYTAL valves are built strictly as per the designs of German and installed for Boiler feed Pump protection. Also termed as Minimum Flow valve, are deployed to cater to most demanding conditions and are one of the most critical valves installed in a power plant.

Available in globe and angle form as per the plant layout requirements. Material of construction is normally carbon steel with 17% Cr plasma nitrided trim ensures smooth, trouble free and everlasting performance.

A typical application would be to reduce water pressure from 120 Bar down to 1 Bar.

ARC valves are for ON/OFF as well as regulating service. The sizes range from 15 mm to 150mm and the ratings are up to 2500#.

Sizes	: 1/2" to 6"
Rangeability	: 50 : 1
Rating	: Upto ANSI 2500#
Characteristics	: ON/OFF, Equal %, Linear, Modified

SAFETY RELIEF VALVES

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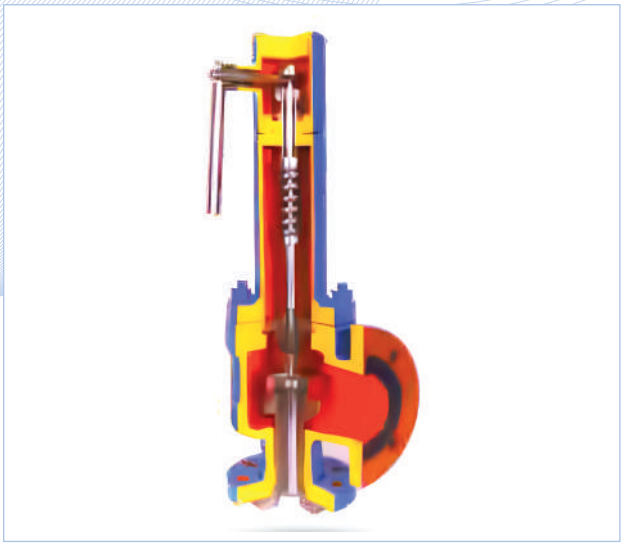


Cut section of conventional spring loaded safety valve

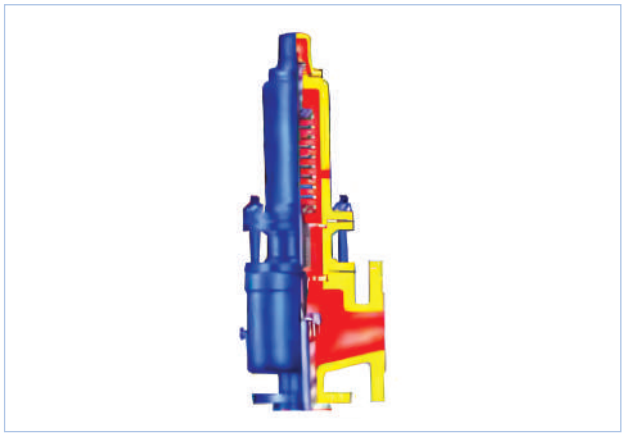
Full lift-Full Nozzle Safety Relief Valves

VYTAL FUii Lift Full Nozzle Safety Relief Valve is designed confirming to A.P.I. standard 526.

VYTAL Flow safety relief valve has the critical accuracy to assure the performance and protects expensive equipment from dangerous high pressures. These valves are knowledgeably designed for Power, Oil Refinery, Petrochemical and Process industries and are 100% factory tested for "Zero defect".

Safety Valves tested on air, Liquid relief valves tested on water, Safety Relief Valves for gases tested on air.

- Full nozzle with self aligning temperature equalizing flat face valve disc
- Careful preparation of the seating surfaces to optical precision and coba lt based overlays on trim maintain premium tightness.
- Top guided design to ensure full bore discharge.
- Options like Bellows, ‘0’ ring, Variety of top fittings available to suit the duty conditions.
- Size rang 25mm to 200mm with orifices 'D' through 'T'
- Production Testing toASME Section VII UG-136 (d).
- Quality Assurance Plan complies with section I & VIII Of the ASMEcode.



Pilot-Operated Safety Relief Valves

VYTAL pilot -operated safety Relief Valve is an autonomous valve. It does not need any auxiliary source of power to operate. The fluid under pressure in the equipment to be protected is used to actuate all operational modes.

Existing codes reflect the capabilities of both past and present Safety Relief Valve designs and allow for an accumulation above the maximum allowable working pressure before full capacity is achieved. A conventional spring loaded valve requires upto 10% over pressure to achieve full l ift. This can result in the system being subjected to excessive stress during an emergency. VYTAL pilot operated Safety Relief Valves require no over pressure for full lift. This means the valve can be set at the desired relieving point without worry of undue system stress and possible ultimate damage.

Designed for high pressure relief pressurised spheres, vessels and pipelines. vessels are pilot operated to provide lead-free operation and full lift at set pressure. Built in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Div.I. Size range 25 mm to 200 mm inlet.

Primary advantages:
Full lift at set pressure
Leak-free operation upto set pressure
Eliminates blowdown loss.

SAFETY RELIEF VALVES

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Pilot operated safety velve

Liquid Relief Valves

This range of relief valves is specially developed and designed to remain tight when used under adverse conditions such as high pressure hot water boilers and economisers.

The valve is of a totally enclosed design preventing the escape of liquids when the valve is discharging at pressures from 0.25 to 70 bar. The main features of this range are Clean bore, Non chattering. No guide fins to become jammed in the seal bore. Top hefty guiding. Strong construction with stainless steel trim minimizes deformation and leakage. Inlet size 25 mm through 200mm, flanged inlet and outlet connections

Conventional spring loaded safety relief valve with closed bonnet & hazardous applications

High performance safety relief Valves

This is a range of high performance Safety Relief Valves made from forgings and barstock, available with screwed inlet and outlet, or flanged inlet and outlet, or flanged inlet screwed outlet connections.

These valves are usually supplied with a plain screwed cap and are available with carbon steel or stainless steel body. The standard trim Material is stainless steel but alternative trim materials are available. Orifice sizes "D" through "H".

Sizes range from 15mm x 25mm to 50 mm x 80 mm Pressure range up to 400 bar depending on valve size.

SELF ACTING PRESSURE REDUCING VALVES

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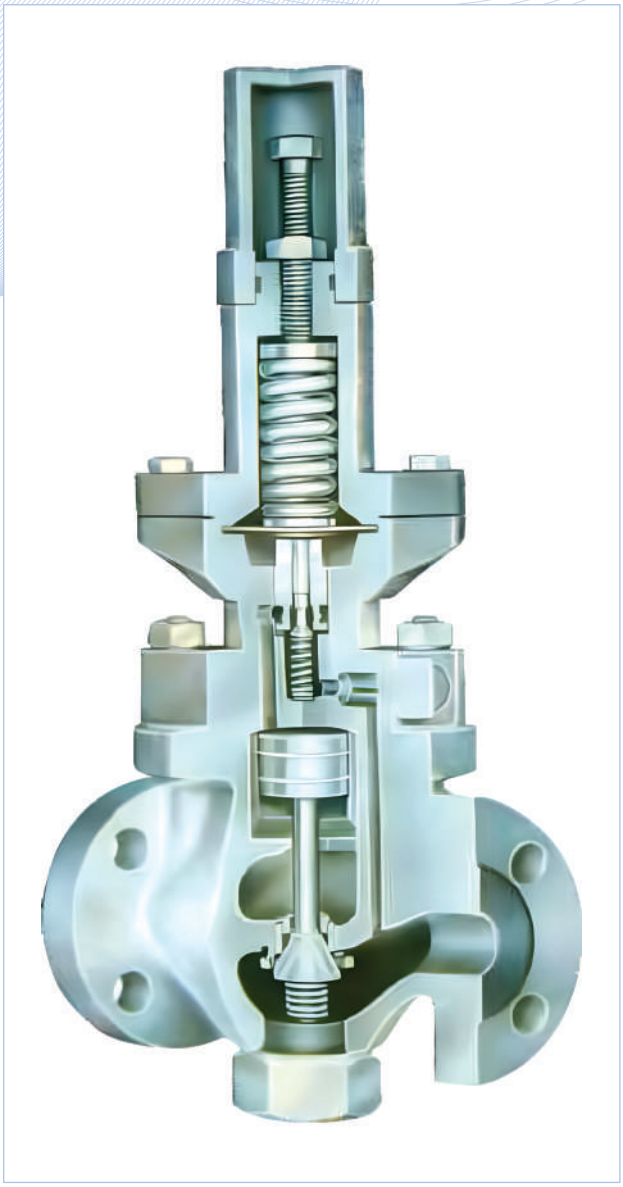

Detailed view of Pressure reducing valve

Sizes	:	1/2" to 6"
CV	:	0.05 to 105
End connections	:	Screwed or flanged upto 600 # rating
Temperature Limit	:	Upto 270 °c with stainless steel spring and 410°C with Inconel spring.
Pressure Limit	:	46 bar

VYTAL Mark I series of self-contained regulators are pilot and position operated type. The simplest form of this series is a "Pressure Reducing Valve" While control valve may be utilized to handle most regulator type applications, there are distinct advantages in using regulators where possible such as:

- A regulator is a self-contained design and needs little or no external tubing.
- A regulator acts instantaneously.
- A regulator requires no external power source, and hence no downtime due to loss of air and electricity.
- A regulator has less chance of external leakage because of its packless construction.
- A regulator is economical initial / installation cost wise.
- A regulator if properly sized is efficient and reliable. (the engineering data/graphs are available for sizing on request.)

Full Lift Pressure Reducing Valve

Pilot and Piston operated self actuating 'PRV' controls the downstream pressure with an accuracy of± 1 %, regardless of fluctuations in upstream pressure or flowrate. It can be used for steam, air, gases or liquids. Constant downstream is maintained from full flow to 10% of flow (Rangeability 1 O : 1). In the Mark I design, main valve is single seated and normally closed. Initial pressure exerted on the main valve assisted by a main spring force ensure tight shut-off. Irrespective of the valve size pilot assembly remains the same. At the same time, the main valve can be converted from a reducing valve to a Back Pressure Regulator or a Different pressure Regulator.

- Balance design unaffected by variations in inlet pressure.
- Instantaneous response to changes in demand.
- Full lift design achieves high flow rates.
- Effective" Low Flow" control due to single seat design.
- Increased seat/chest ratio for lower velocities and quiet operation.
- Stellited trim ensures tight shut-off even after prolonged use.

SELF ACTING PRESSURE REDUCING VALVES

VYTALVAL
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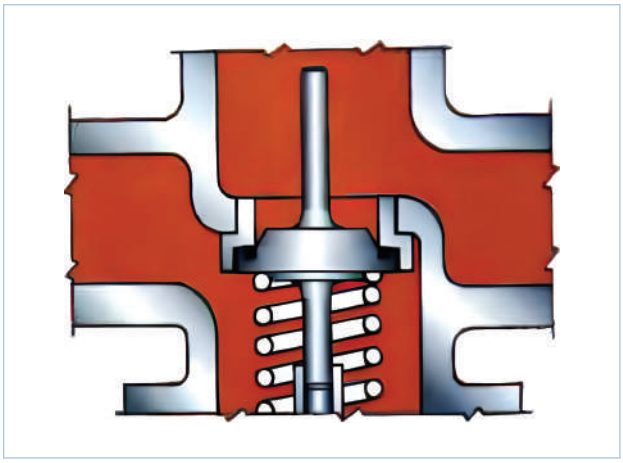
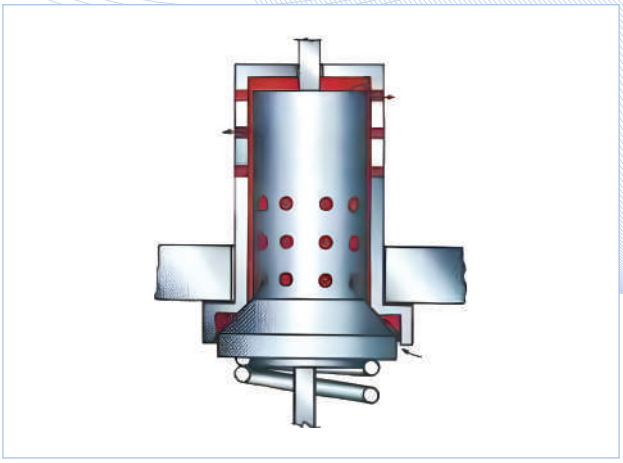
Manufacturing in India





Soft Seat Arrangement

In order to avoid seat leakage on light gas services, the main valve/seat and pilot valve/seat are provided with elastomer seat seal. The elastomer material is selected to suit the duty conditions. Another important application for this type of valve, is an explosive nature of gases e.g. Hydrogen. When the gas passes through the valve at high velocity, static charges are created leading to the possibility of spark, this can be disastrous in explosive gas atmosphere. Under these circumstances, the soft seated valve is always recommended.

Cage Guided Trim

In order to obtain high pressure drop, normally two or more valves are installed, which is expensive and often disappointing, when the leakage of the upstream valve throws all of the ΔP on the downstream valve. In such cases, a PRV with multijet caging is recommended. The three stage pressure reduction (number of stages are decided based on critical ΔP ratio) is achieved with the help of multistage perforated cage. The design offers the following advantages:

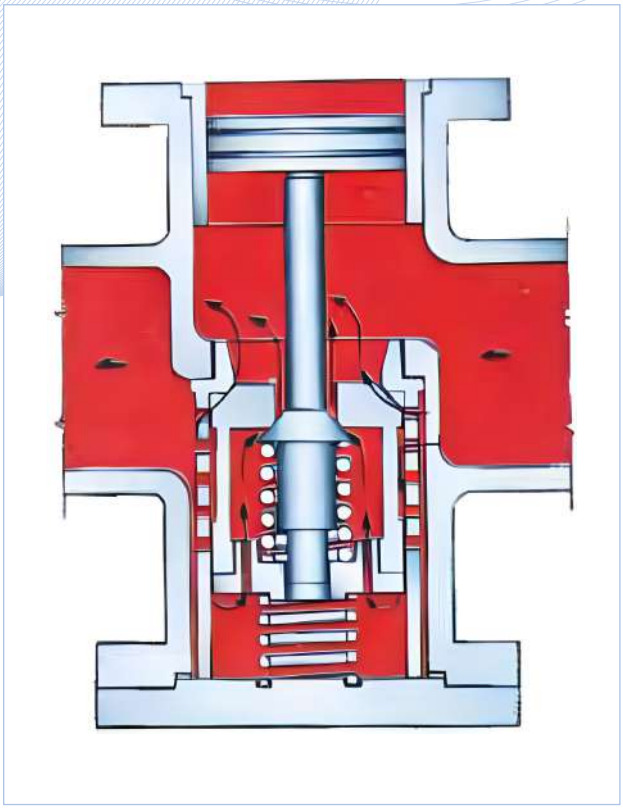
- Flow distribution leads to the noise attenuation.
- Pressure drop is distributed across different stages and not at the throttling point between main valve and seat, thus reducing the trim wear.
- Low cost installation and maintenance of only one valve.
- Increased overall system performance.

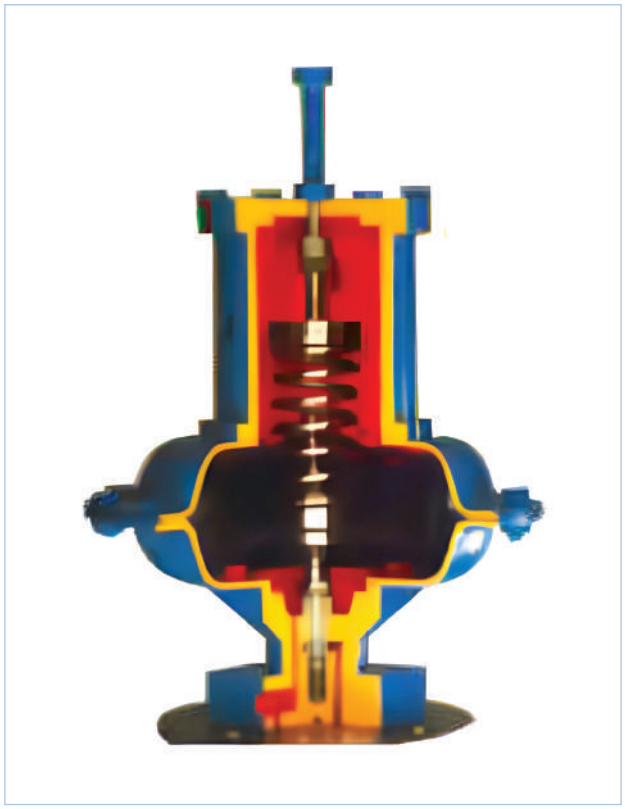
Reduced Capacity Trim

- In cases where it is more convenient, on account of the pipe connection, to have a valve larger than is necessary to deal with the quantity of steam, we can fit smaller seats so that regulation will be satisfactory.
- To avoid replacing the valve body with another of a different size when a future increase in the flow is expected in relation to that at the start of operation.
- When the pressure drop across the valve is considerable, it is better to use a larger body for the advantage of rigidity.

Low Pressure Pilot

When set pressure are in the range of 50mm WC to 2000mm WC, the regular pilot assembly cannot provide enough of controlling thrust. In order no to achieve this, VYTAL offers Pressure Reducing Valve with a special low pressure top assembly. The assembly is supplied as a complete conversion unit for fitting to the regular pilot assembly. It incorporates a larger diaphragm, thus providing a greater effective area and improved sensitivity to very low outlet pressure conditions.





Large turndown achieved by twin plug arrangement

Auxiliary Valve

The limitation on regulator sizing is rangeability (1 0 : 1 in conventional valves). Very low rangeability is observed in case of the steam regulator, because of its limitation to operate the main valve close to its seat (because of wire drawing). There are several ways of increasing rangeability, mainly by design/selection of proper trim characteristics.

The best way to control the Cv minimum is to provide the auxiliary plug. It regulates in the range of minimum flowrate to the minimum controllable flow rate. Once the minimum flow is achieved, the main valve takes over and operates till the maximum flow is obtained. Thus the twin plug arrangement offers multiple rangeability from 20 : 1 to several hundred.

REFORMER VALVE

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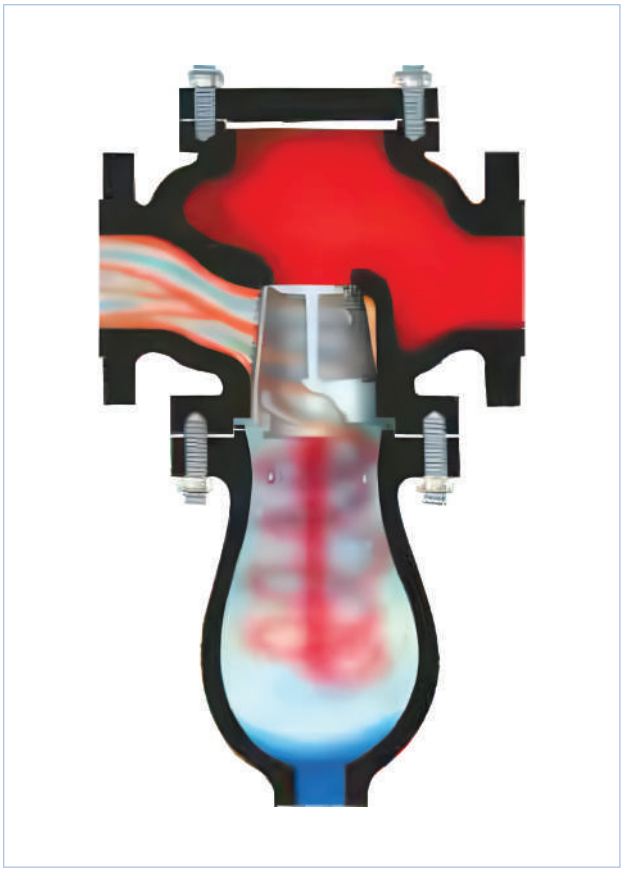
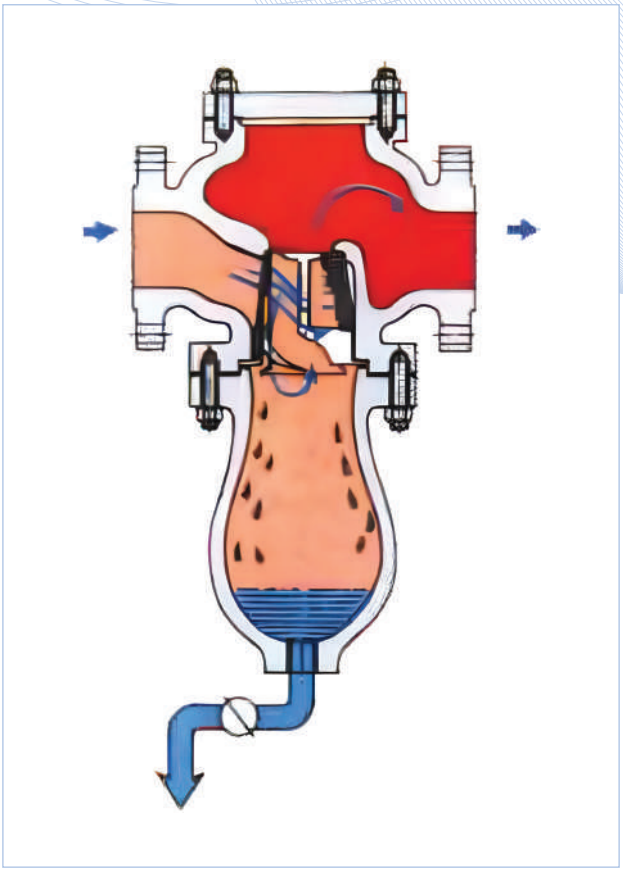


Detail of Reformer without valve



Cross section of Reformer showing drain arrangement

Steam Reformer Improve Plant Performance and Product Quality

A new advanced design to help you improve the efficiency and effectiveness of your business by offering you, unrivalled knowledge of improving steam quality at minimum capital outlay and running costs.

Clean steam and compressed air means maximum efficiency and minimum maintenance. Dust, scale, rust, jointing material, weld metal and other foreign particles will clog valves, put drain traps out of action, block orifices and ruin processes.

Separators can promote higher production for lower fuel cost because steam contains more heat than hot water at the same pressure. Steam as dry as possible at the point of use is important. Steam Separators improve the rate of heat transfer.

PRESSURE REDUCING STATION

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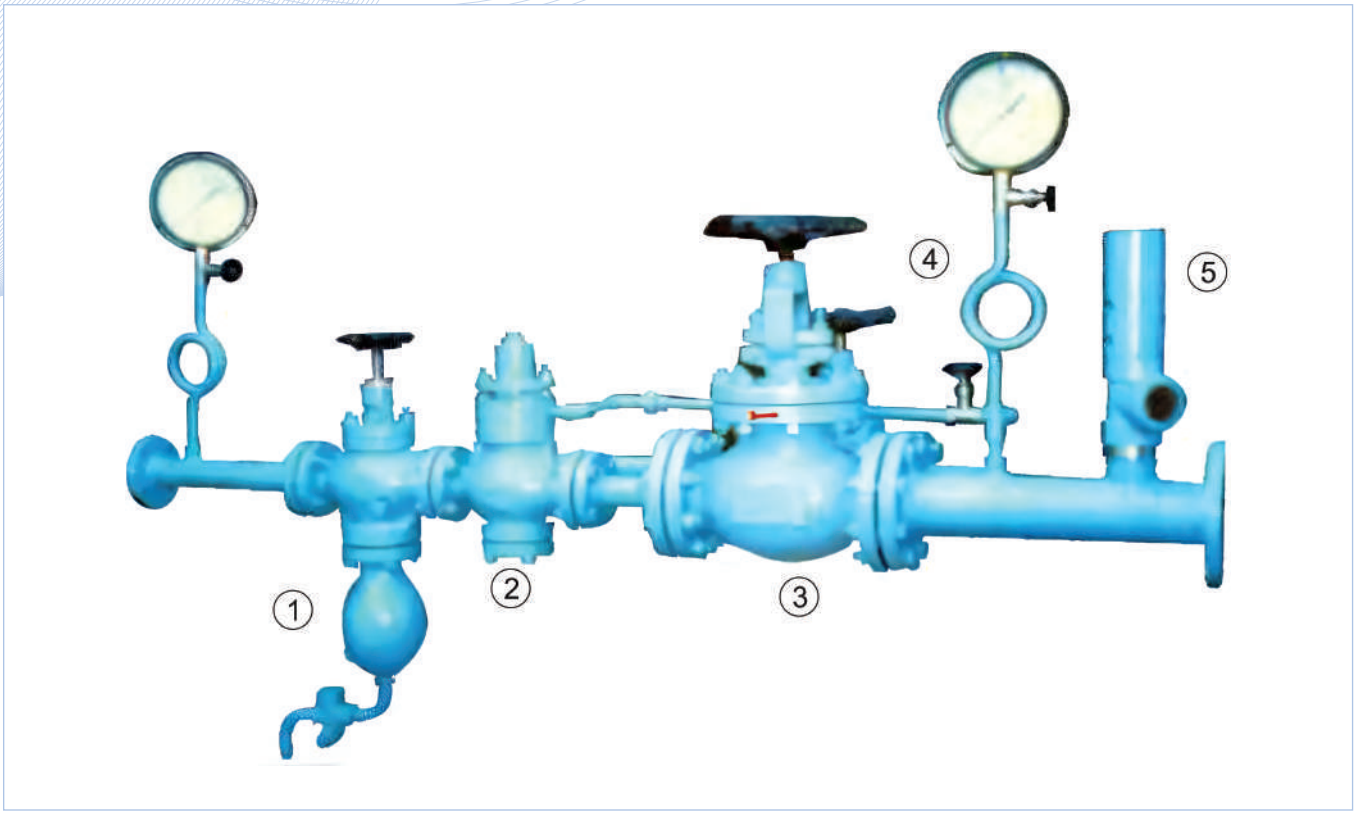

Pressure reducing station incorporating Reformer unit makes it extremely compact, cost efficient and easy to maintain.

In order to obtain the right pressure at the consumption point it requires CONSISTENCY, ACCURACY and RELIABILITY from a reducing valve. Thus, it is necessary to install: A bypass and isolating valve, to ensure continuation of supply when the reducing valve is being serviced.

Reformer valve in a reducing station will improve steam quality, productivity and pressure reducing valve service life is extended, since the effective removal of condensate and scale protects the main valve from erosion.

Safety valve is installed on the downstream of a PRV. Since the pressure vessels are fed with low steam pressure (through a PRV) they need complete protection especially where there is a risk of explosion. The safety valve should be sized for a total quantity of steam that passes when the PRV is fully open.

For the best possible operation of a Pressure Reducing Station, correct sizing of pipework and associated fitting / components is extremely important. VYTAL Flow designs, manufactures and tests all the components of PRS unit in its own facilities, thereby guaranteeing "Single Unit Responsibility".

1) Reformer Valve
2) Pressure Reducing Valve
3) Isolating Valve
4) Bypass Valve
5) Safety Valve

PRESSURE REDUCING AND DESUPERHEATING VALVE

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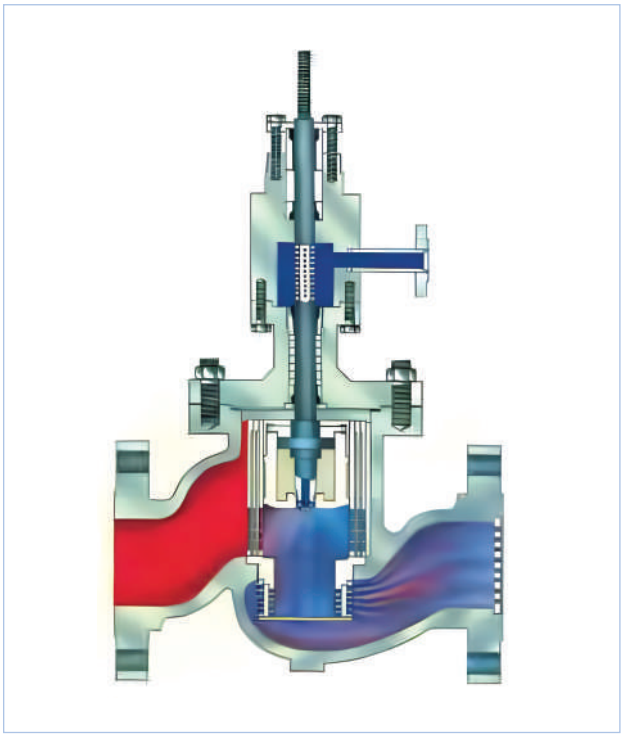

Cross section of Steam conditioning valve

Sizes	:	2" to 20" with Cv ranging from 35 to 2600
Rangeability	:	50:1
Rating	:	up to ANSI 2500#
Superior Water pressure	:	Cooling water at approximately 5 bar above the steam operating pressure OR high pressure BFW.

Steam Conditioning Valve

The principle function of any desuperheaters is to accelerate the phenomena of absorption of the spray water by the steam so that steady conditions of steam temperature are reached within a short distance from the outlet at all loads. This ensures that poor quality of steam or water droplets are not carried downstream in the steam pipeline. The purpose therefore, is to develop methods by which heat transfer between steam and water can be hastened. The main purpose is to break spray water droplets into very fine particles at all loads to ensure increased surface area for water to come in contact with the steam is available, thereby increasing the rate of evaporation. It is very clear that size of the water droplets should be smallest, utmost surface area available, absorption will be almost instantaneous and true temperature will be measured within shortest distance.

In all instances of desuperheating, the nature of the downstream steam and the avoidance of large spray water droplets that can be propelled at high speed to damage elbows, valve seats, heat exchanger tubes, or process material are very important factors while designing desuperheating system and equipment selection.

VYTAL series Steam conditioning valve with revolutionary multinozzle atomizer and feed forward design adds to our latest generation of quality valves. The equipment is utilized for simultaneous pressure and temperature reduction of steam. The cooling water is introduced in the highest turbulent zone of the steam. High steam velocity at this point, results in the highest coefficient of heat transfer between the steam and water. The feed forward design assures soft misty spray and instantaneous temperature control over the full range of steam flow.

- For high pressure let-down, pressure drop is taken across concentric flow cages rather than across seating surface, resulting in minimal seat wear.
- Pilot operated cage design to achieve extremely tight shut off (leakage classification ANSI # V)
- Balanced design with heavy duty pilot spring greatly improves throttling stability at high ΔP.
- Larger outlet and outlet diffuser options give noise attenuation at optimum design conditions guaranteeing outlets sound pressure level to 85 dBA.
- Stellited trim increases its resistance to corrosion, erosion by abrasion, galling and sticking.

DUMP TUBES

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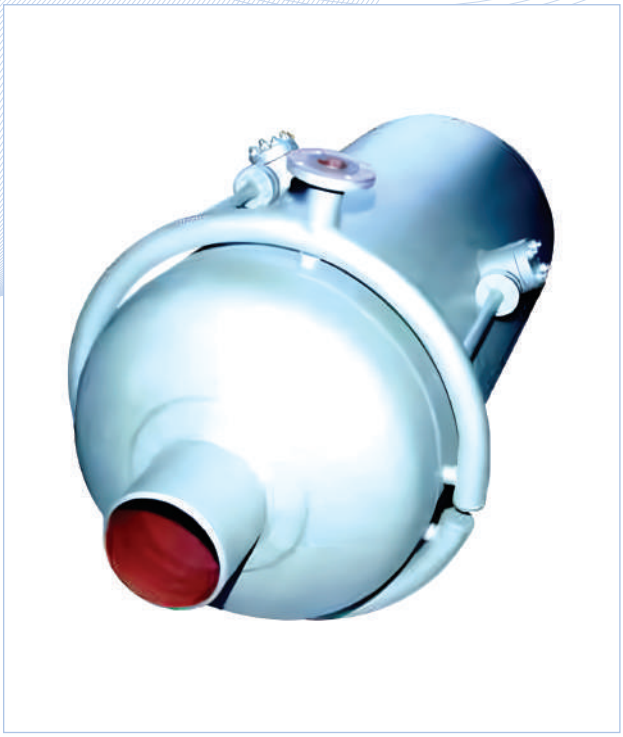
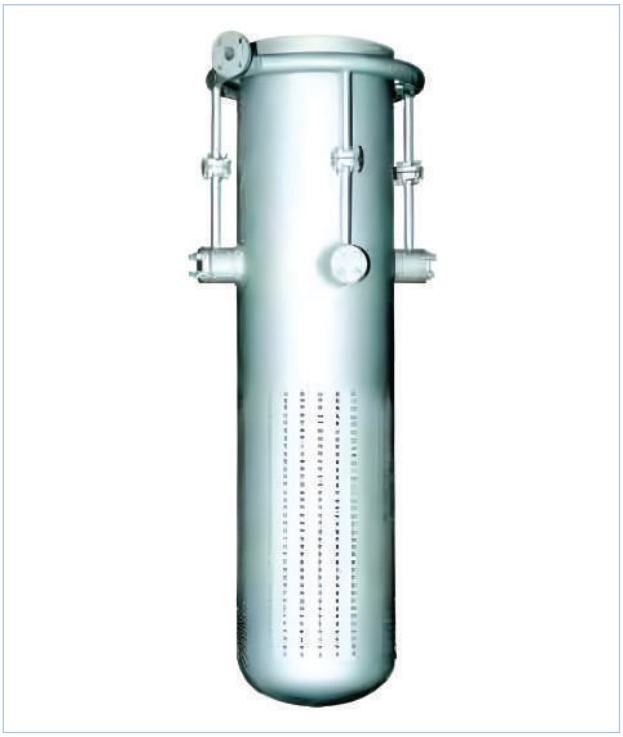


Dump Tube



Dump tube with integral spray water device

Function and Application

Dump Tubes are an important part of a system discharging in a condenser. These devices are primarily deployed so as to minimize the size of the bypass valve outlet where the specific volume of steam dramatically increases at low or sub-atmospheric pressures.

These dump tubes are normally fitted into the condenser inlet duct and are carefully designed to achieve the final pressure reduction stage and allow the steam to expand and cool prior to entering the turbine exhaust or condenser.

It is recommended to ensure that the dump tube is designed properly with respect to size, shape and profile so as to avoid interference with the turbine exhaust steam path under normal turbine operation. The arrangement and the size of the holes in the dump tube are selected so as to minimize noise generation and direct the steam path away from the duct walls and towards the condenser inlet depending upon the installation.

Depending upon the installation, the arrangement of the holes are selected. In case the dump tube is installed in the condenser then the arrangement of the holes is such that the holes are drilled in two 90 degree sectors.

This does not allow the steam to go up the turbine exhaust or directly down on to the tubes in the condenser.

In case the dump tube is installed in the turbine exhaust then the holes are drilled around the complete circumference i.e. 360 degrees.

The dump tubes are made in single and for special applications double tube versions are available. The material varies as per requirement fromalloy steel, carbon steel or stainless steel.

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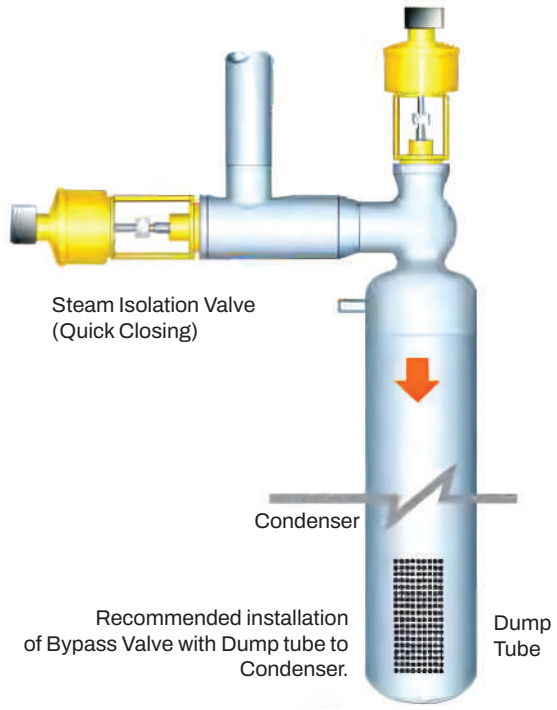
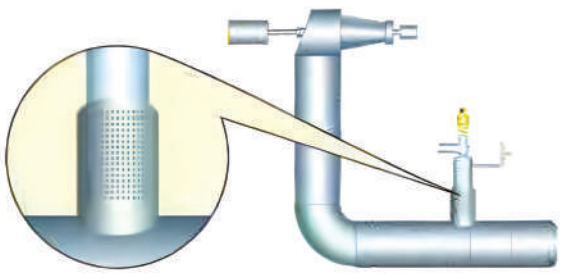


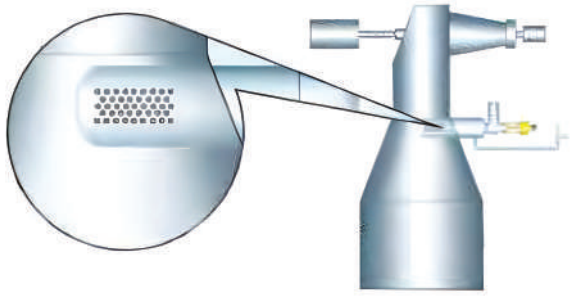
Operating Philosophy

The cooling water required to bring down the temperature is sprayed in the valve or in the dump tube. No water is sprayed in the Condenser. The amount of cooling water quantity is calculated by heat balance calculation. Feed forward algorithm is used in the Distribution Control System.



Dump tube installation tor Air cooled Condenser

For the dump tube that is installed in the turbine exhaust, the holes are drilled around the complete circumference i.e. 360 degrees.

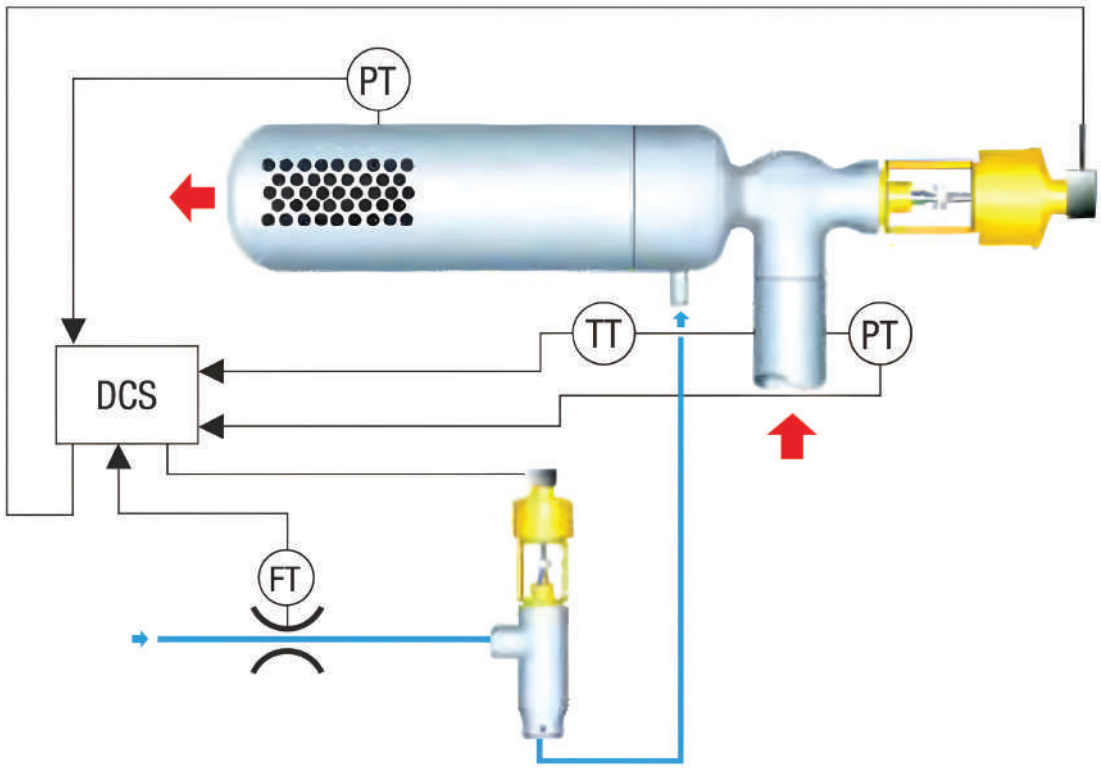


Dump tube installation for Water cooled Condenser.

For the dump tube that is installed in the condenser then the arrangement of the holes is such that the holes are drilled in two 90 degree sectors.

- Dump tubes are combined with a Steam conditioning valve or Turbine bypass valve for dumping the steam in the Condenser.
- These tubes are deployed so as to reduce the bypass valve size and thereby reduce the overall cost of the system.
- By installing dump tubes large pipe sizes between the Bypass valve and the Condenser are reduced and made very short.
- Each dump tube is a tailor made device for each application.

Feed forward design



Main control scheme

Inlet steam pressure, temperature, and the position of the valve give the flow rate of steam via the valve characteristics. The required spray water quantity is calculated as the algorithmhas pre-programmed steam tables and is compared via the FT - Flow transmitter installed in the spray water line or position feed back transmitter.

The result is the control signal given to the valve position er of the spray water valve.

The pressure transmitter installed on the dump tube measures the steam pressure in the dump tube.

Since the dump tube is a fixed orifice, the signal from the pressure transmitter indicates the flow through the dump tube.

Our Certifications

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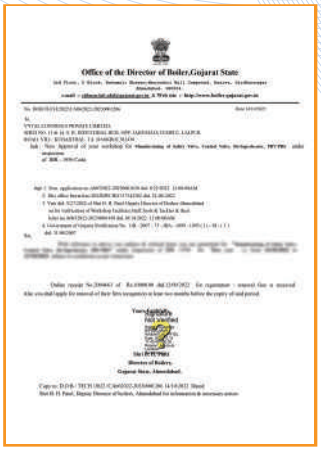
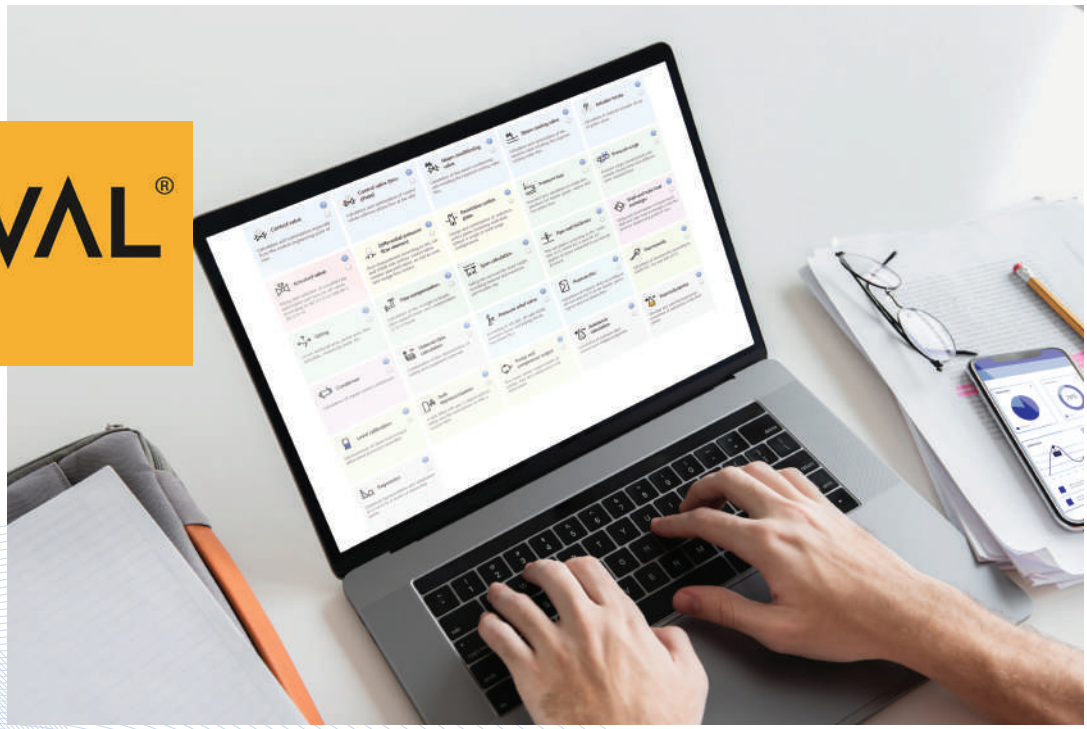


CONVAL®
by F.I.R.S.T.



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