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NON-CATALOG PRODUCTION

Zakłady Automatyki "POLNA" S.A. in Przemyśl have been operating non-stop since 1899.

Since 1960s, nineteen sixties, its many production programs can be divided into four product groups:

- automatic control engineering (industrial automation)
- heat engineering
- central lubrication equipment and systems
- laboratory equipment: water distillers.

The biggest product group consists of automatic control engineering products.
This production started in 1967, when a licence for control valves and pneumatic actuators was purchased from MASONEILAN company – one of the world leaders in this industry.

In subsequent years work continued on post-license works developing and expanding the range of and varieties of products, as well as developing its own designs for the needs and requirements of the market.

Such work led to the creation of a big offer of valves and pneumatic actuators within the Company's catalog. The product range consists of valves ranging in size from DN15 up to 300 and with nominal pressure from PN6 – 400 and with flow coefficients from Kvs 0,01- 6,300 and with cast bodies made from various materials:

- globe valves, passage, single-port valves with linear motion of the plug:

Types **Z**, **Z1A**, **Z1B**, **Z2,**

- globe valves, passage, double-port valves with linear motion of the plug:

Type **Z10**,

- globe valves, passage, single-port, with rotary-plug:

Type **Z33**,

- globe valves three-way valves with linear motion of the plug:

Type **Z3**,

- tight butterfly valves, lined:

Type **PRS**,

- diaphragm, pneumatic, multi-spring actuators:

Type **P/R**, **P1/R1**, **P5/R5**.

Over the last tens years, the importance of non-catalog products has increased, as they are designed and too the the requirements of the client and the technological needs of their project.

At present, the share of the automatic control engineering products now exceeds 30% of production, thus the necessity of presenting them in more detail.

1. Valves constructed using forged elements.

The use of forgings in pressure elements of valves enables the use of this product to work in the highest burdens in terms of pressure, temperature and the corrosive environment, which is only achieved thanks to the proper selection of materials and construction solutions.

Depending on the needs, we manufacture valves with various construction solutions: angle, passage, passage/angle („Ł" shaped with parallel, non-axial ends) and three way valves.

POLNA also offers a whole range of connections for pipelines; flange (made to EN and ANSI standards) for BW welding, direct for the body, flange-less and others.

The material used for the body is chosen depends on the working pressure during maximum working temperature. The most commonly used materials are:

- S355J2G3 (1.0570),
- 13CrMo4-5 (1.7335),
- 14MoV6-3 (1.7715),
- X10CrMoVNb9-1 (1.4903)) and others.

2. The Elimination or restriction of harmful effects related to flow.

The flow of substances through a valve, depending on it's type and parameters can cause such phenomena as high noise, cavitation, evaporation (flashing), choked flow and erosion levels, that could have a negative impact on the environment, reducing the regulatory values of the valve and having a negative impact on the product's durability.

To avoid such an impact these factors should be analyzed in detail. These actions are mainly focused on restricting the speed flow and the division of total pressure reduction on the valve into a few steps, so that the pressure reductions do not exceed critical levels.

Multihole elements (plugs, cages, plates), are in common use, and their main role being to limit noise levels. The division of pressure is achieved by means of resistance structures within the valve, such as multi-stage plugs, cages and throttling plates.

Reduction of flow speed is achieved by division of pressure reduction on the valve and/or application of enlarged outflow diameter in the valve's body or expanding elements (diffusers).

An important role is played by the proper choice of materials and the ways of increasing hardness of internal valve elements. We often utilize hardened surfaces using stelliting, plasma or diffusion nitriding, heat enhancing and protective coating.

All these factors will only fulfill their role if work conditions are known, valves are constructed properly with the skills and knowledge of our long experience.

The opinions of POLNA product users prove that we can design and manufacture valves completely fulfilling even the very highest of their requirements.

3. Valves designed for work in aggressive or dangerous environments.

POLNA produces valves for work with dangerous substances such as oxygen, hydrogen, natural gas, acidic gases containing H_2S and in dangerous environments where there are risks of explosions.

The preparation consists of the careful cleaning of surfaces coming into contact with the substance using both mechanical and chemical means, as well as using materials and ways of production and control complying with safety regulations.
Products intended for work in atmospheres with high risk of explosion are manufactured in compliance with the ATEX directive.

4. Products adapted to the specifics of particular industries.

Every branch of industry has its own characteristics, which have to be taken into consideration in the phase of designing, manufacture and control of automatic control engineering.

For products designed for power industry, the possibility of the occurrence of high temperature and pressure, thermal shocks, choked flows and excess noise must be taken into consideration.

POLNA has some tried and tested applications of product especially designed for various uses in power industry, such as:

- boiler feed valves, also fulfilling the role of starting valves,
- reducing and cooling stations with integrated injection in a pressure reducing valve,
- elements of reducing and cooling stations with integrated steam pressure reducing valves, desuperheaters, injection valves.

Pressure reducing valves, passage and angle models, with balanced plugs, eliminating choked flow, with a vast range of flow regulation.

Piston, ring, lance and steam-atomizing desuperheaters.
Anti-cavitation injection valves.

- minimum flow valves used as pump by-pass valves,
- condensate piling valves
- three-way valves for power industry applications.

For products designed for the gas and petrochemical industry, chemical resistance, it is important to take account of resistance to high pressures, flow speeds and significant temperature changes, as well as protection of the environment and work safety.

Products include:

- pressure reducing valves for significant changes of flow values,
- valves eliminating choked flow and limiting noise,
- valves working in low temperature environments (e.g. in Siberia),
- deposit water valves,
- high-pressure natural gas valves,
- valves used in cryogenics,
- anti-cavitation valves and valves resistant to erosion (flashing) for gas mines, stamping presses and gas distribution plants.

5. Valves complying with boiler regulations.

Basic valve products refer to production in accordance with the 93/27/EC pressure directive , concerning the fixing on pipelines.

POLNA also has the capability of manufacturing valves designed for vessels, in accordance with PL-EN 12952-3:2004 norm (“Water-tub boilers and auxiliary installations – Part 3: Design and calculation for pressure parts”) .

6. Custom built valves manufactured to the clients requirements.

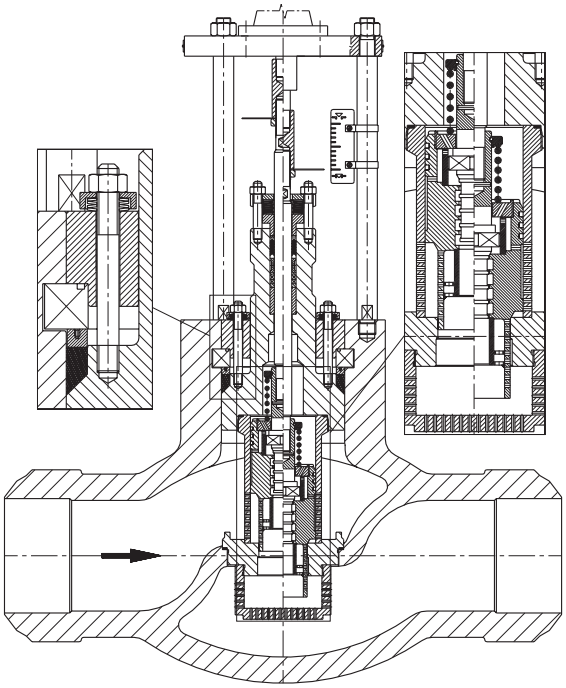
POLNA has the capability to design and manufacture valves adjusted especially for particular uses. Detailed description of requirements is key. With the use of a professional computer program CONVAL we determine phenomena occurring in particular points of a valve’s work. That information, together with long-standing experience, enables us to design valves fulfilling the recipient’s requirements. To mention just a few examples showing the variety of manufactures, we have made:

- valves for underground installations, with a proper solution of valve’s drive,
- high-pressure control and cut-off valves for the food industry,
- a wide range of valves adjusted to work in conditions of cavitation risk. The structures of valves take into consideration the requirements concerning changes of flow values (regulatability) and reduction of pressure on the valve occurring at the change of valve’s opening. Due to the uniquity of those conditions, each valve may have a structure different from the others in terms of details of technical solution.

Boiler feed valve, also fulfilling the role of a starting valve.

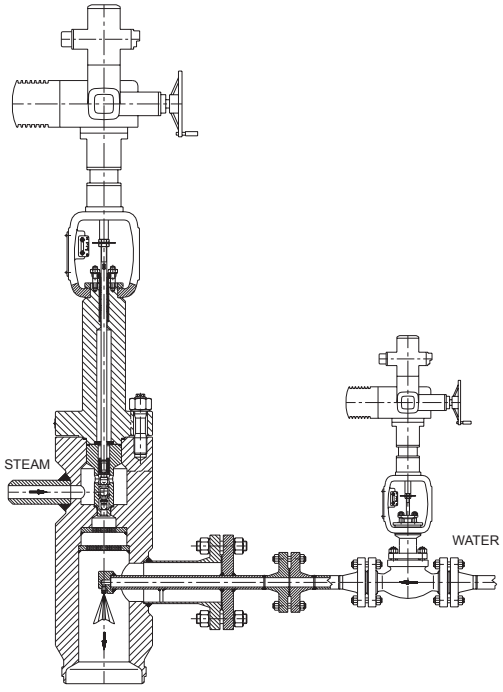
A cast body, material G17CrMo9-10 (1.7379), with a self-tightening bonnet. The main plug is controlled by an auxiliary plug (pilot), flow over the plug (FTC). A multi-step pilot allows to regulate small flows at big pressure reductions without the risk of cavitation occurring.

The main plug: two-step up to the middle of lift, with resistance elements (plates). When opened wider, no internal throttling; the function of filling the boiler is carried out at a small pressure reduced. A protective cage on the seat. It is highly air-tight



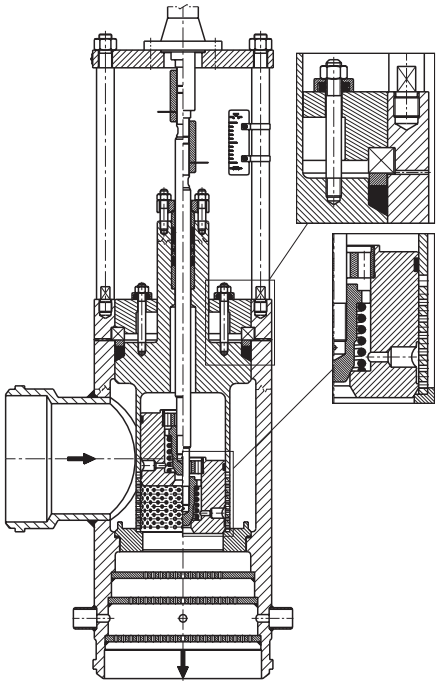
Reducing and cooling station.

An angle steam power reduction valve DN25 / DN150, is made of X10CrMoVNb9-1 (1.4903). A multi-stage plug and resistance plates on the outflow aiming at elimination of choked flow and limiting the noise levels. The cooling chamber is an integral part of the valve. A lance desuperheater, an injection valve with an anti-cavitation structure.



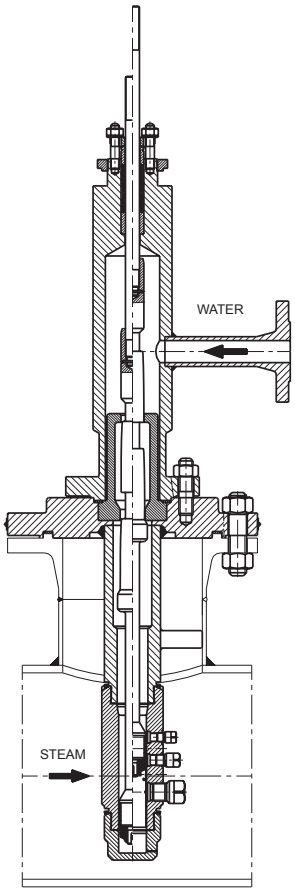
Steam reduction valve.

An angular body made of 13CrMo4-5 (1.7335). A self-tightening bonnet. The main plug: cage type, controlled by an auxiliary plug (pilot). A diffuser integral with the body of the valve with three resistance plates.



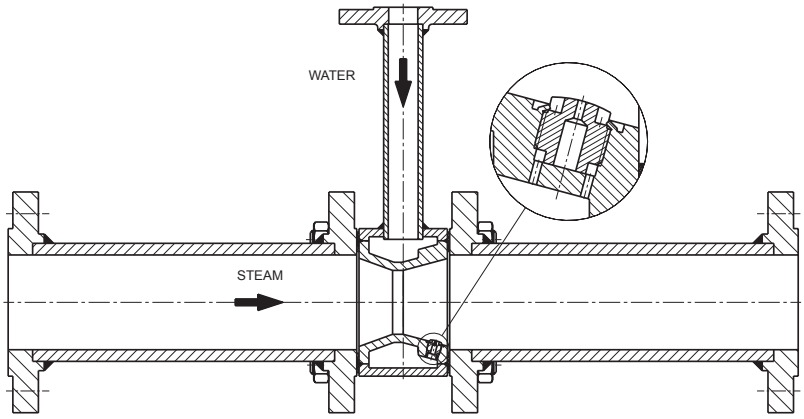
Piston desuperheater

Regulation scope Kvmax 10; regulatability 1:40, V class tightness in accordance with PN-EN 60534-4 standards. The valve part with a one- or two-step profile plug made of the 13CrMo4-5 (1.7335).
The pipeline diameter ranges to over DN200.



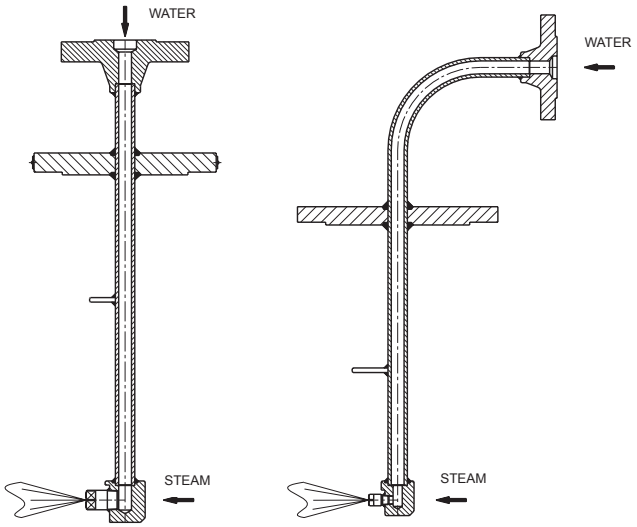
Ring desuperheater.

Regulation scope Kvmax 1.0; regulatability 1:3. Range of pipeline diameters: up to DN150.



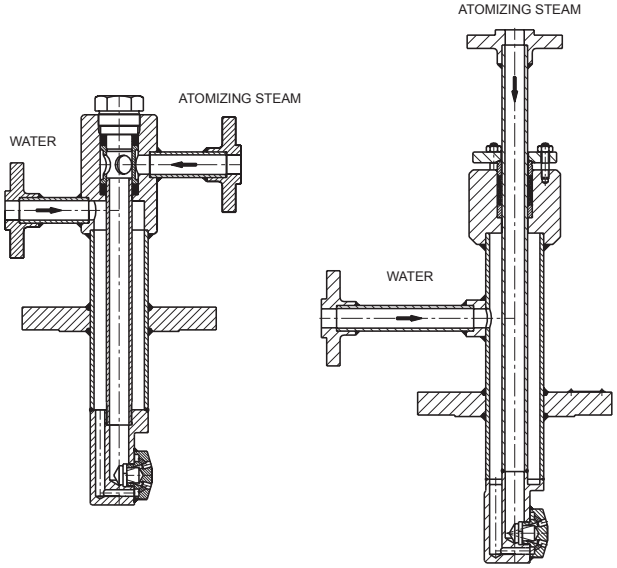
Lance desuperheater.

Regulation scope Kvmax 1.0; regulatability 1:3. Range of pipeline diameters: up to DN300.



Steam-atomizing desuperheater.

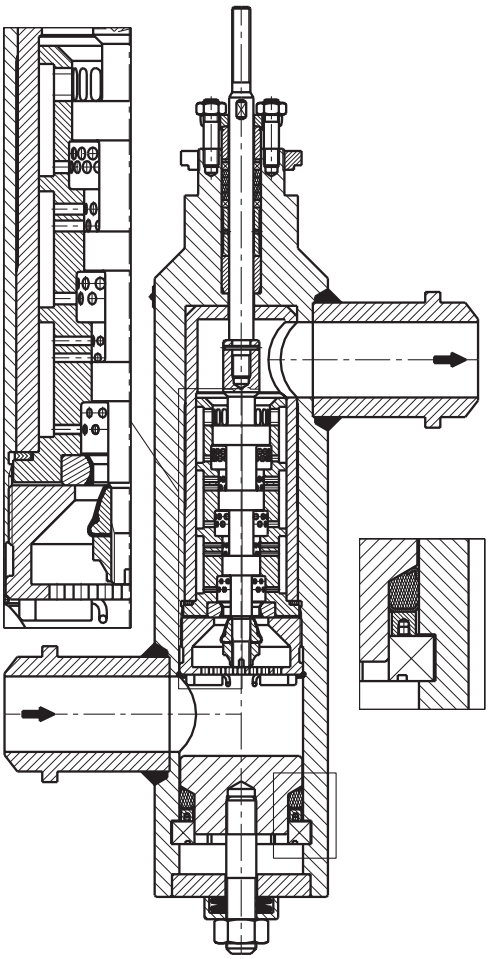
Feeding with auxiliary steam is necessary. Regulatability 1:15. Range of pipeline diameters: over DN150.



Minimum flow valve.

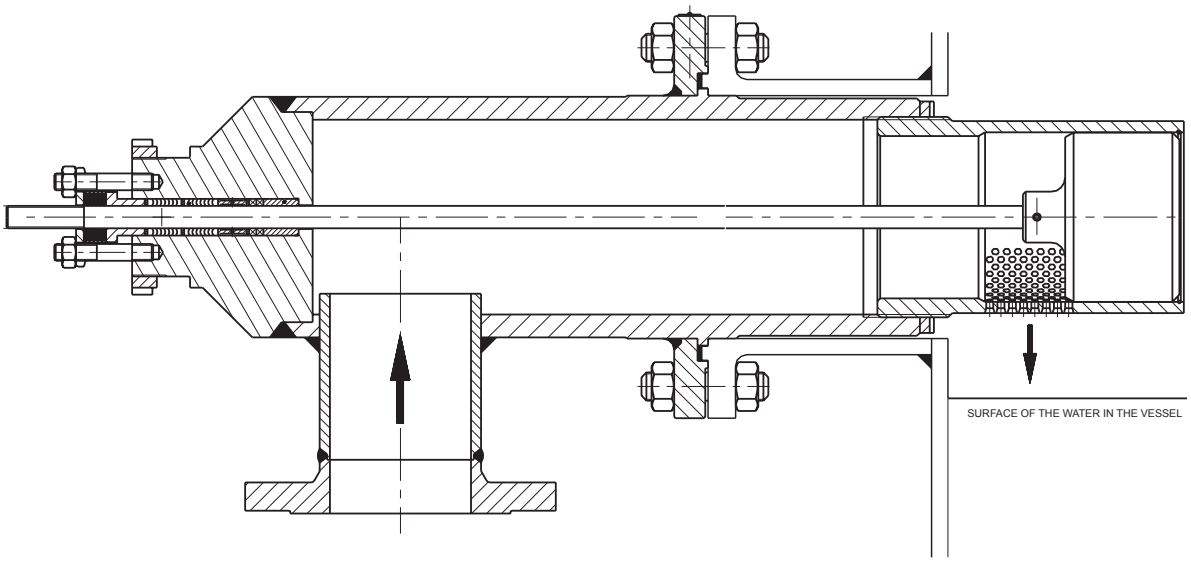
Nominal size of the valve: DN50 PN320. It's used for flow regulation approx. 60t/h at pressure reduction of up to 200 bar. Non-bonnet design with a packing seal in the low pressure zone.

A three-step plug combined with a multi-hole sleeve creates six steps of throttling. Perfect closure tightness as a result of flow over the poppet (FTC). Adjusted to on-off function and control one, used in by-pass systems of feeding pumps.



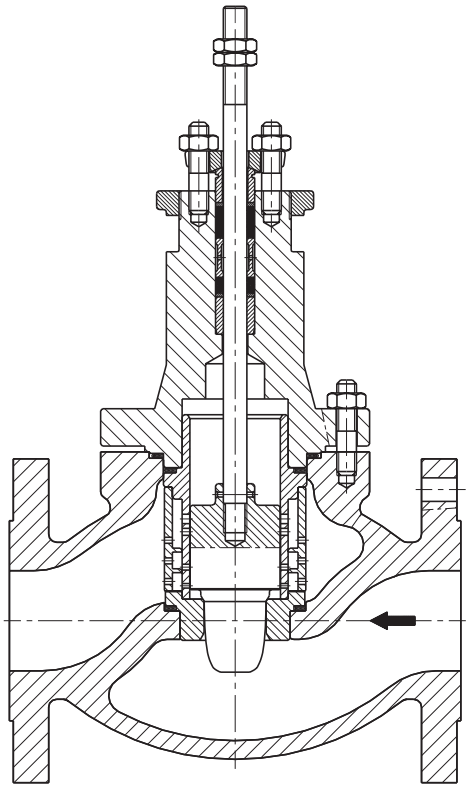
Condensate piling valve.

It is fixed directly at the container with the outflow directed to the liquid surface, which eliminates potential destruction of the vessel's elements by cavitation and erosion.



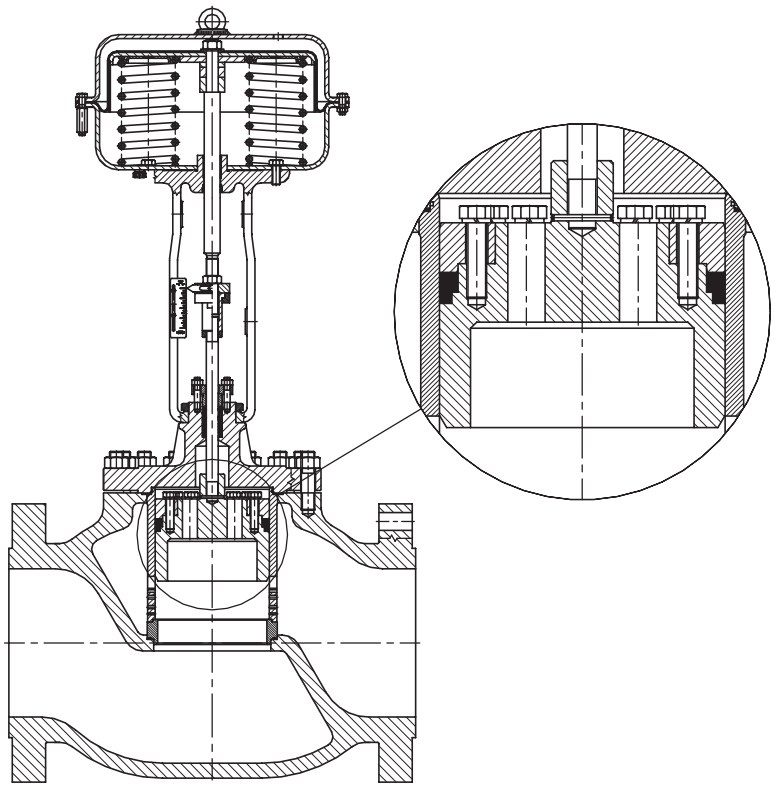
Valve with a two-step plug and a throttling cage with several throttling chambers.

It is designed for applications reducing noise level and eliminating cavitation or choked flow.



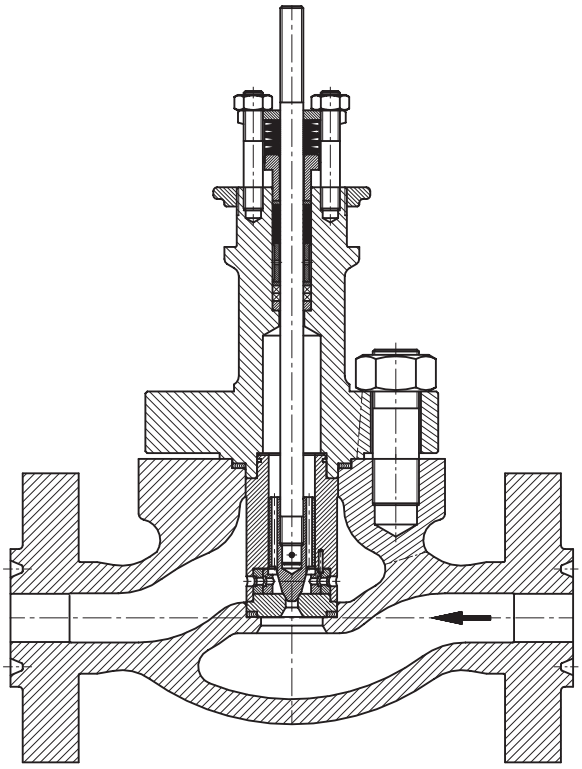
Control valve for low environment temperatures.

DN300, CL600 valve works on natural gas installations in Siberia. A balanced plug, casts elements of the valve and an actuator made of cast steel are capable of working in low temperatures are available in the ASTM A352LC2 variety. The elastomer parts of the actuator (diaphragm, seals) are made of silicone.



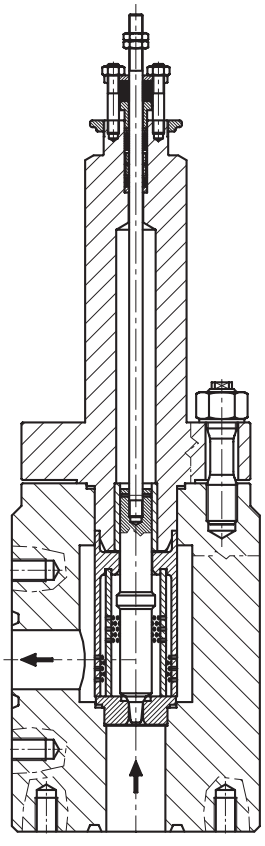
Deposit water valve.

An anti-cavitation structure with three multi-hole resistance plates.



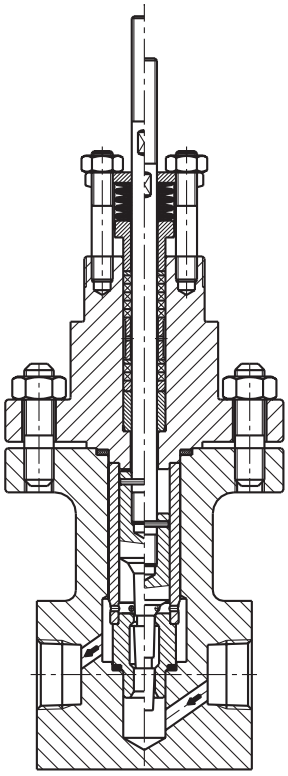
Natural gas valve.

An angular body, pipeline counter flanges directly connected to the body. Working pressure 450 bar, nominal pressure PN700. Flow under the plug (FTO); full opening of the plug cuts off access of the agent and impact of pressure on valve stem packing.



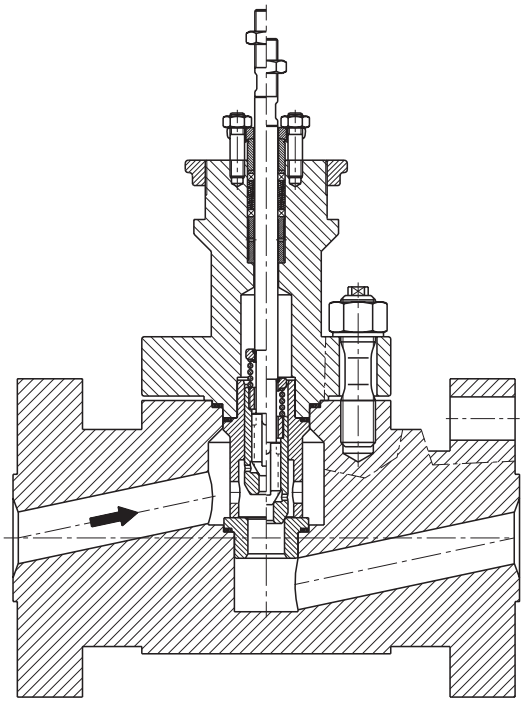
Anti-cavitation valve.

The body is made of a forging, threaded ends. A multi-step plug, and a throttling cage. Non-service packing of stem fulfilling tightness requirements according to TA Luft. It is currently in use at the “Dębno” gas mine in Poland.



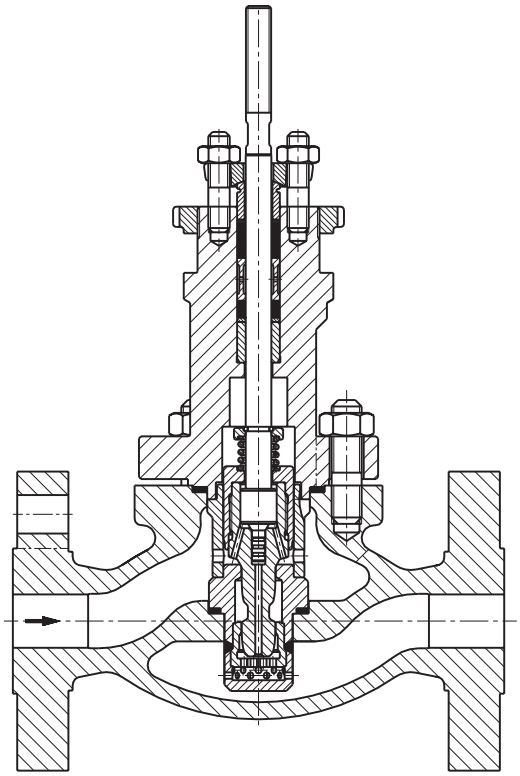
Cut-off valve.

A flange body is made of forged X2CrNiMo17-12-2 (1.4404) – 316L. material Working pressure is up to 530 bar. Two-part plug structure: an internal plug and a main plug for static relief upon the opening of the valve.. Flow over the plug (FTC), high closure tightness. This product has been designed especially for the food industry.



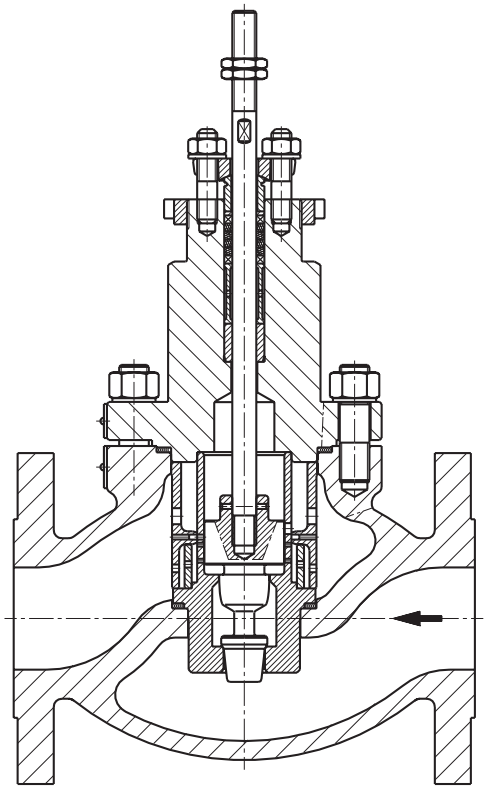
Anti-cavitation valve.

This product solves the problem of regulation and anti-cavitation protection at small opening of the valve. The internal plug – multi-step, the main plug – two-step, with a throttling cage in the seat. Flow over the plug (FTC).



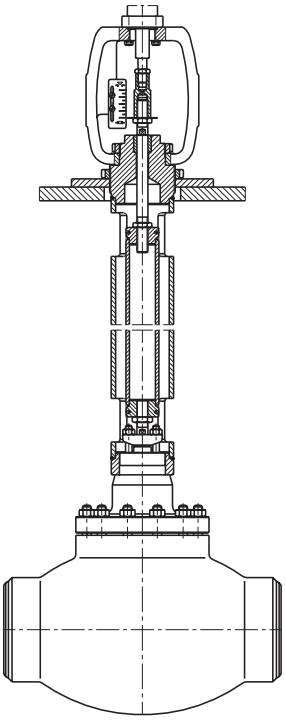
Double-position anti-cavitation valve.

This product solves the problem of small flows during big pressure reductions and big flows at small pressure reductions, if there is a risk of cavitation in both cases. A three-step profile/piston plug, a throttling cage divided into chambers with proper throttling.



Valves for work in underground installations.

Such valves require leading the drive over ground and connecting it to the valve in a durable and reliable way. The length of distance elements and the way of fixing them to the ground must be chosen with considering the possibilities of the valve's localization.



High parameters control valve.

The body is made of forged elements with structure „ ⅂” DN250 PN320, Kvs320P. The material used is 13CrMo4-5 (1.7335), a self-tightening bonnet, a plug balanced by a graphite ring. Manufacture conforming to PN-EN 12952 3:2004 “Water-tub boilers”.