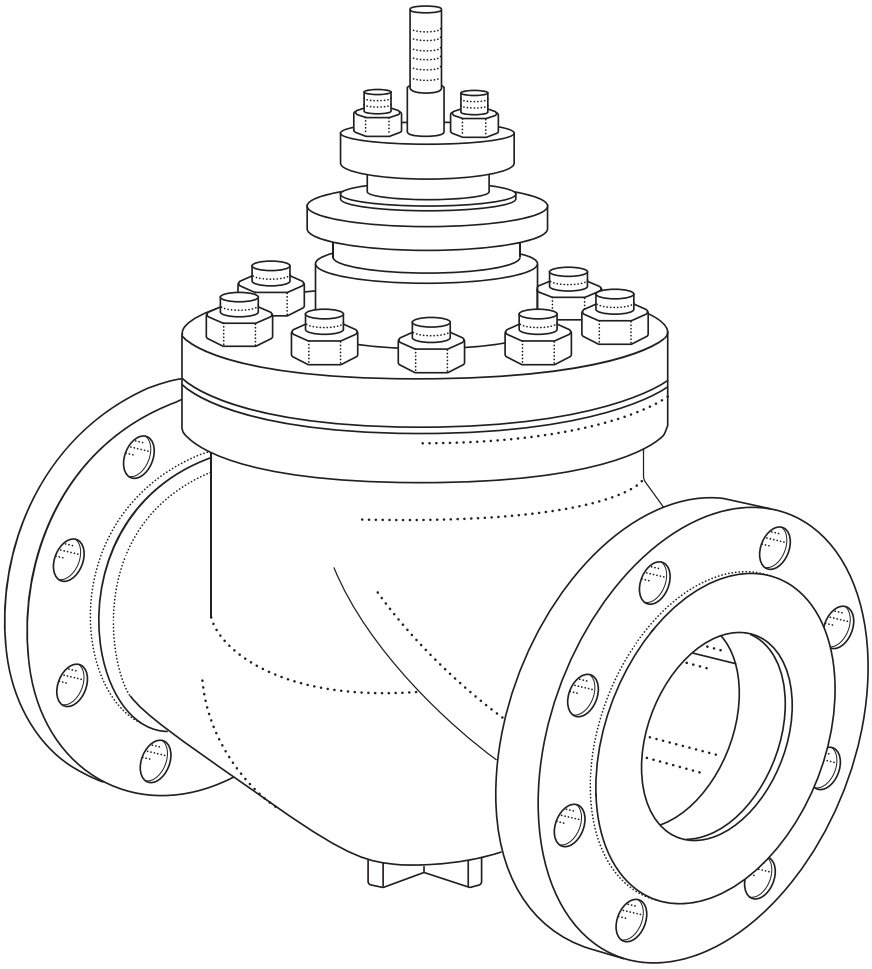
РУСТ 95

Product Catalog

technical information



leading since 1995

Valve Engineering

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About the plant

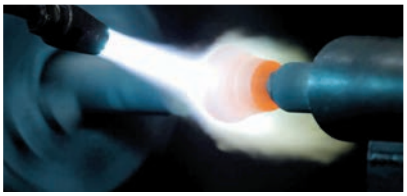
РУСТ-95 JSC is a Russian manufacturing company leading on the high-quality shut-off and control pipe valve market.

РУСТ-95 plant is one of the few that carry out a full production cycle, from design development to product assembly, delivery to customers, and service support.

Today, РУСТ-95 Plant is the largest industry enterprise with an area of 12.5 hectares and more than 800 people employed.



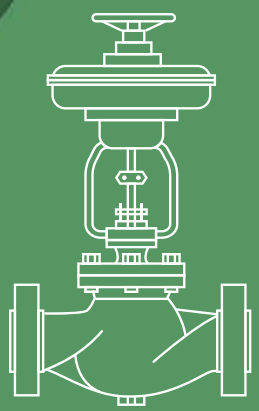



РУСТ-95 JSC manufacturing sites

- Foundry
- Mechanics
- Stamping
- Welding
- Rubber and hardware
- Paint and varnish
- Assembly
- Heat treatment and cladding workshop
- Galvanic workshop
- Test laboratory
- Packaging and shipping workshop
- Service department
- Technical control department
- Design office

Valves



300, 400, 500 series valve

Shut-off (series 300), multipurpose (series 400), and control (series 500) valves are designed for controlling and/or cutting off the flow of liquid and gaseous media.

DN Nominal diameter
15 to 500 mm

PN Nominal pressure
1.6 to 40 MPa

T Operating medium temperature
-196 to +550 °C

Features

01

Repositioning forces on the stem

Thanks to its pressure-balanced plunger design, the valve requires little effort to actuate, even with a high pressure differential on the valve. This makes it possible to use low-power actuators for 300, 400, and 500 series valves.

02

Replacement of internal components without dismantling the valve from the pipeline

Possibility to upgrade internal valve assemblies or replace worn parts without disassembly from the pipeline.

03

Body protection against wear

Achieved by having the throttling process occur within the multipurpose assembly, preventing the inner surface of the body from being exposed to destructive high-speed flow effects.

04

Maintainability

The valve internal components have simple shapes and can be repaired using standard metalworking equipment.

05

High flow capacity

The bodies are designed to ensure proper functioning of full bore shut-off valves and high flow capacity for control valves.

06

Anti-surge regulation

Provides the highest level of tightness of the gland seal.

Nomenclature of РУСТ 300, 400, 500 series valves

DN \ PN	1.6	2.5	4.0	6.3	10	16	25	40
15	✓	✓	✓	✓	✓	✓	✓	✓
20	✓	✓	✓	✓	✓	✓	✓	✓
25	✓	✓	✓	✓	✓	✓	✓	✓
32	✓	✓	✓	✓	✓	✓	✓	✓
40	✓	✓	✓	✓	✓	✓	✓	✓
50	✓	✓	✓	✓	✓	✓	✓	✓
65	✓	✓	✓	✓	✓	✓	✓	✓
80	✓	✓	✓	✓	✓	✓	✓	✓
100	✓	✓	✓	✓	✓	✓	✓	
125	✓	✓	✓	✓	✓	✓	✓	
150	✓	✓	✓	✓	✓	✓	✓	
200	✓	✓	✓	✓	✓	✓	✓	
250	✓	✓	✓	✓	✓	✓		
300	✓	✓	✓	✓	✓			
400	✓	✓	✓	✓				

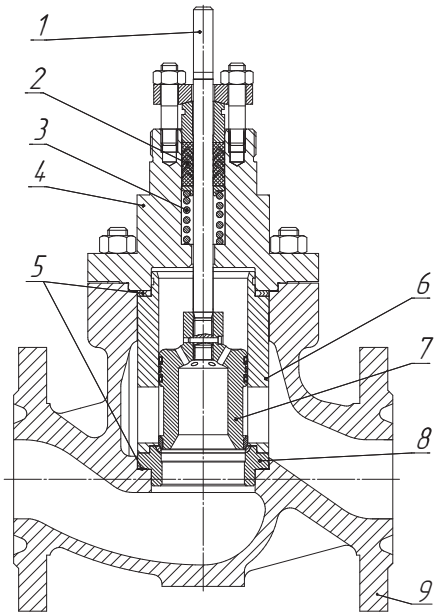
Operating principle

Balanced (cage) valve design

The 300, 400, and 500 series valves are module-designed. The valve internal components are combined into a separate module—the multipurpose throttle assembly secured in the body [9] with a cover [4] and gaskets [5]. The multipurpose throttle assembly is composed of a sleeve [6], a seat [8], and a plunger [7]. In the balanced design, the valve plug moves along the assembly axis, covering the bore section in the sleeve, which is profiled with holes of a specific shape. The shape and size of the holes determine the valve flow capacity and flow characteristics.

The plunger and perforated sleeve are made from special materials to prevent jamming. The valve plunger is moved by the stem [1], which is extended outward through a gland seal at the top of the valve cover. The gland seal [2] consists of chevron seals and a spring [3] that performs activating and compensating functions.

The operating medium flow moves along the S-body and passes through the multipurpose assembly. The plunger [7] moves, altering the THROUGHPUT and consequently affecting the flow rate. Erosive impact on the body [9] is prevented with all negative processes occurring within the multipurpose unit.

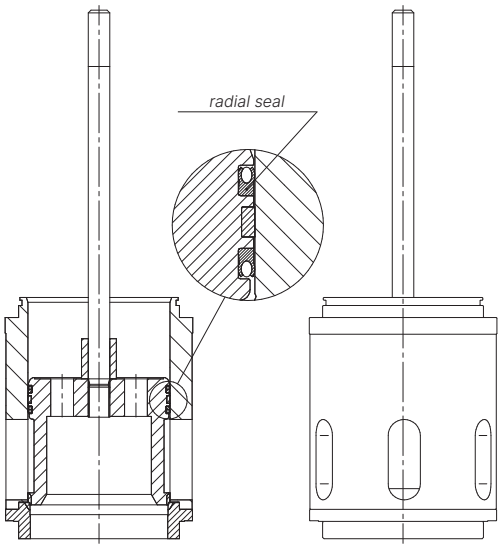


Relief principle

Balanced valve design

The plunger design is pressure-balanced. Relief holes ensure equal pressure on the plunger end surfaces, regardless of the medium flow direction in the valve. Overflow into/from the cavity above the plunger is prevented by installing a radial seal between the sleeve and the plunger.

When the plunger moves, the valve actuator overcomes only friction forces in the gland seal and plunger radial seals, which are typically a small portion of forces in unbalanced valve designs.



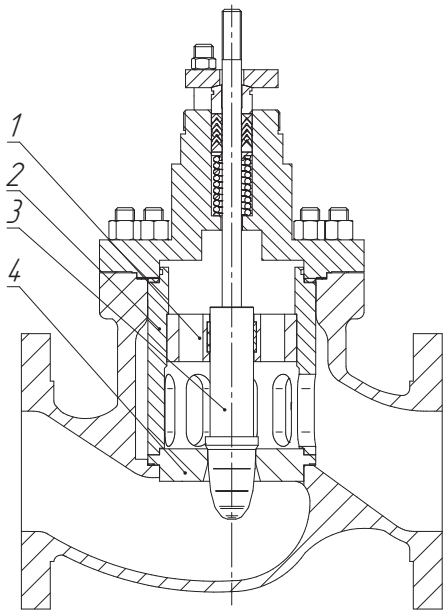
Operating principle

Plunger valve design

The operating principle of plunger valves is the same as balanced valves, differing only in the multipurpose unit design. During movement, the plunger [3] of the valve overlaps the bore section in the seat [4]. The plunger and seat shape and size determine the flow capacity and flow rate characteristic.

Holes in the sleeve [2] are sized to avoid creating significant resistance to flow. A guide [1] for the plunger is built into the sleeve, ensuring its stable position during regulation.

Plunger valve design is preferred for contaminated or viscous media; however, being non-pressure-balanced, it requires more powerful actuators.

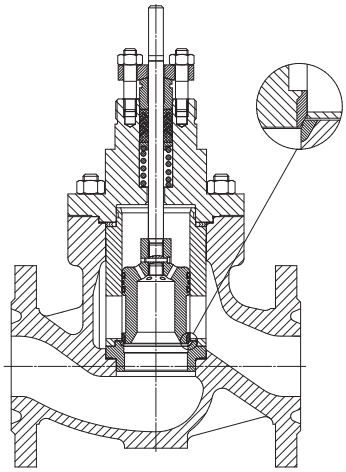


Main seal plunger-seat design

Metal-to-metal

A metal-to-metal seal is utilized when a metal-to-polymer seal is not feasible: in media with temperatures above +225 °C, high flow velocities, or containing mechanical particles.

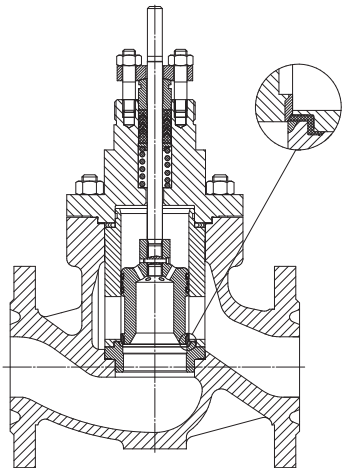
It ensures III-IV tightness classes for control valves and C–B for multipurpose valves. In certain cases, class VI and class A can be achieved for relevant valve types through additional lapping of sealing surfaces.



Metal-to-polymer

A soft seal is employed to attain high tightness class and for media with temperatures up to +220 °C.

The metal-to-polymer seal consists of a non-metallic material insert between the sleeve and seat, such as polyurethane, fluoroplastic, polyamide, and others. When needed, the insert can be effortlessly replaced.

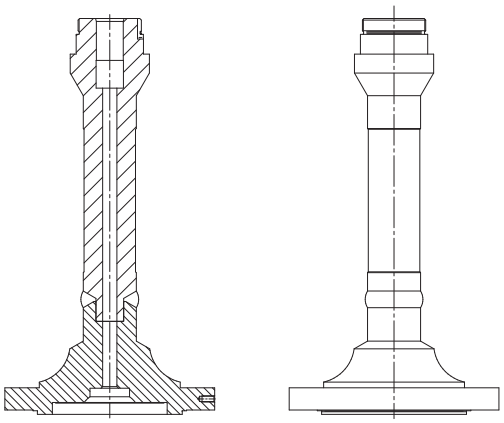


Special designs

High-temperature design
(t above +220 °C)

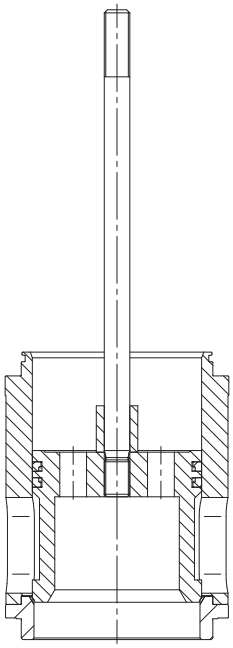
The high-temperature design is distinct from the standard one in terms of the valve cover (dissipating sleeve) design and the internal structure of balanced multipurpose units.

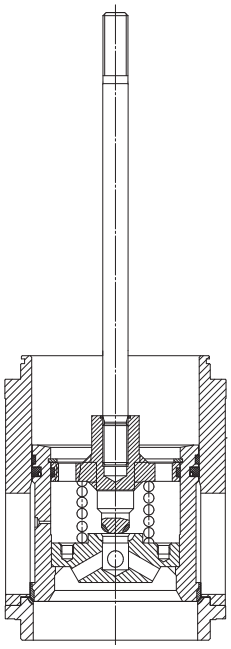
The high-temperature cover (dissipation sleeve) features an elongated top section to relocate the gland seal away from the high-temperature zone. This approach enables the use of standard fluoroplastic-based materials for gland seals.



The configuration of control valves differs by incorporating graphite radial seals between the plug and sleeve, which are resistant to elevated temperatures. This design functions in both forward and reverse flow directions. In this case, tightness does not surpass IV class due to leakage through piston seals.

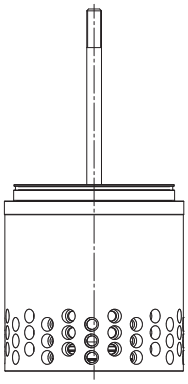
The construction of shut-off and multipurpose valves is based on the pilot principle.
In this case, the flow is directed only inside the sleeve. The plunger features a pilot valve that, when opened, relieves the valve plunger by equalizing the pressures at the top and bottom of the plunger. When the valve closes, the pilot also closes, causing the inlet pressure to accumulate on top of the plug, increasing the force of the valve against the seat and ensuring high tightness.





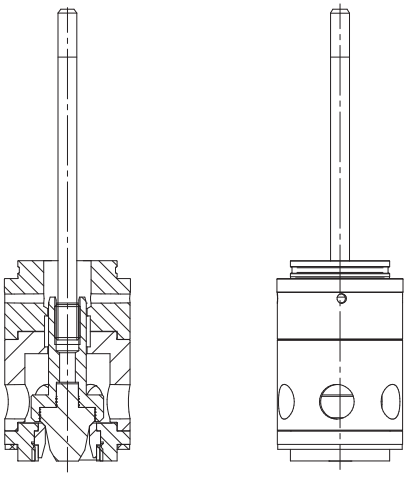
Cavitation-resistant and anti-noise design

To eliminate cavitation during operation with liquid products and to reduce noise levels when working with gaseous media, the control, shut-off and multipurpose valve assembly sleeve is perforated with small holes. Dividing the flow into thin jets significantly accelerates energy dissipation during throttling, resulting in anti-noise and anti-cavitation properties of the valve. This can also be achieved by using a multi-stage throttle assembly.



Erosion-resistant design

This design is used for controlling the flow of chemically aggressive and/or abrasive media, requiring special materials for internal valve parts that are resistant to high-velocity effects of a specific medium, such as ceramics or special alloys (corrosion-resistant heatproof alloys; alloys for castings, etc.).



Hydrogen sulfide resistant design

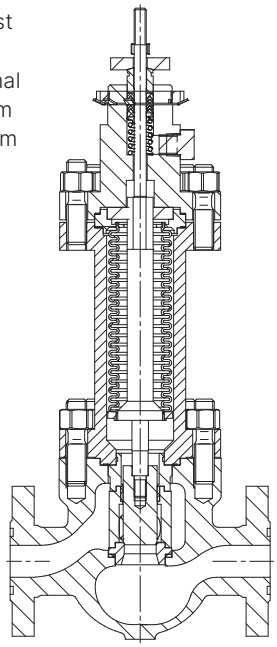
This design is used for controlling media containing hydrogen sulfide, where valve parts require materials in accordance with NACE MR0175 and other regulatory documents.

Cryogenic design

For low-temperature applications, an extended cover and materials that do not degrade under low temperatures are used.

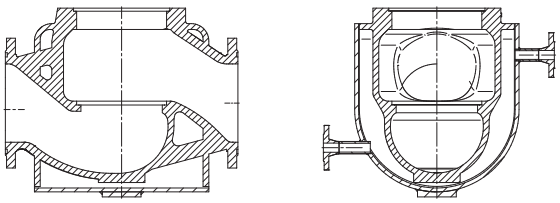
Design with bellows stem seal

It is applied when the utmost tightness of the gland is necessary and even a minimal amount of operating medium entering the external medium is unacceptable.



Design with a heating jacket for the enclosure

It is used for viscous and crystallizing media. In this case, an enclosure is welded to the valve body, allowing the introduction of a heat transfer medium under pressure up to 0.6 MPa.



Technical parameters

Parameter	Value
Nominal diameter, DN, mm	15; 20; 25; 32; 40; 50; 65; 80; 100; 125; 150; 200; 250; 300; 400; 500
Nominal pressure, PN, MPa	1.6; 2.5; 4.0; 6.3; 10; 16; 25; 32; 40
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances, as well as viscous and crystallizing media
Operating medium temperature, °C	-60 to +225 standard design -60 to +420 high-temperature design -196 to +225 special cryogenic design -60 to +550 special high-temperature design
Climatic design	N, T, F, NF, MU
Connection to pipeline	• Flanged in accordance with GOST, ASME, ANSI B16.5 • Welded • Coupling-type
Types of actuators to be installed	• Pneumatic • Manual • Electric • Electromagnetic
Body material	Steels according to standards: ASTM A352; ASTM A351;AISI 321; AISI 316Ti; AISI 904L; ASTM A738, etc. Steels according to standards: AISI 904L Alloys according to standards: ASTM A494
Materials of internal parts	Steels according to standards: AISI 420; AISI 321; AISI 316Ti; AISI 630; AISI 904L; AMS 5848; ASTM A743; ASTM A747, etc. Alloys: Ni-based, Co-based, Ti-based Hard metals: Tungsten Carbide, Chromium Carbide Ceramics: Zirconia, Silicon Carbide
Type of valves	• Control • Multipurpose • Shut-off (cut-off)
Special design	• Cavitation-resistant • Anti-noise • Erosion-resistant • Hydrogen sulfide resistant • Bellows • With heating jacket • Cryogenic • High-temperature
Seal type	• Metal-to-metal • Metal-to-polymer
Tightness classes	As per GOST 9544-2015
Regulation characteristics	• Linear • Equal percentage

Flow capacity*

DN, mm	Nominal flow capacity K_{vy}, m^3/h for control and multipurpose valves
15	0.1–8.0
20	0.1–8.0
25	0.1–16
32	0.1–20
40	0.1–32
50	0.1–50
65	2.5–80
80	1.0–125
100	1.6–200
125	1.6–250
150	10–400
200	20–630
250	200–1,000
300	320–1,600
400	800–2,500

* Custom capacities are available upon request, not exceeding the maximum for the specified size

Weights*

DN, mm	PN, MPa	Weights, kg (Operating medium temperature: 225 °C / 225–420 °C)
15	1.6; 2.5; 4.0	7/10
	6.3; 10; 16	14/17
20	1.6; 2.5; 4.0	8/11
	6.3; 10; 16	16/19
25	1.6; 2.5; 4.0	10/13
	6.3	16/19
	10; 16	18/21
32	1.6; 2.5; 4.0	15/19
	6.3	21/25
	10; 16	30/34
40	1.6; 2.5; 4.0	17/21
	6.3	27/31
	10; 16	39/43
50	1.6; 2.5; 4.0	23/27
	6.3	32/36
	10; 16	46/50
65	1.6; 2.5; 4.0	37/45
	6.3; 10; 16.0	77/86
80	1.6; 2.5; 4.0	44/53
	6.3	59/68
	10; 16	88/96
100	1.6; 2.5; 4.0	65/76
	6.3	87/98
	10; 16	128/137

DN, mm	PN, MPa	Weights, kg (Operating medium temperature: 225 °C / 225–420 °C)
125	1.6; 2.5; 4.0	133/141
	6.3; 10; 16.0	145/165
150	1.6; 2.5; 4.0	138/145
	6.3	187/193
	10; 16	271/277
200	1.6	197/207
	2.5; 4.0	227/237
	6.3	279/289
	10; 16	482/498
250	1.6; 2.5	422/465
	4.0	488/531
	6.3	566/609
	10	711/754
	16	821/864
300	1.6; 2.5	666/709
	4.0	757/800
	6.3	822/865
	10	975/1,018
400	1.6; 2.5	917/961
	4.0	974/1,019
	6.3	1157/1,207

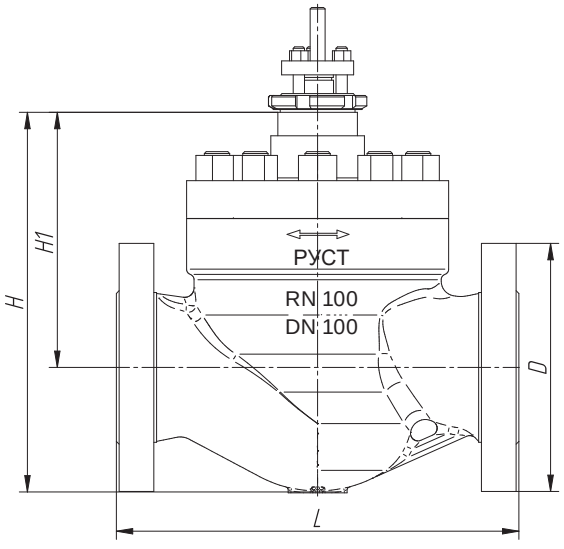
* Weight is specified without actuator, for other DN it is available upon request

Overall and connecting dimensions*

DN, mm	PN, MPa	L, mm	D, mm	H, mm t: 225 °C / 225–420 °C	H1, mm t: 225 °C / 225–420 °C
15	1.6; 2.5; 4.0	130	95	177/369	129/321
	6.3; 10; 16	180	105	210/404	157/351
20	1.6; 2.5; 4.0	150	105	183/375	130/322
	6.3; 10; 16	190	125	220/414	157/351
25	1.6; 2.5; 4.0	160	115	187/392	129/335
	6.3; 10; 16	230	135	204/396	137/333
32	1.6; 2.5; 4.0	180	135	227/435	159/368
	6.3; 10; 16	260	150	224/433	149/359
40	1.6; 2.5; 4.0	200	145	250/572	177/499
	6.3	260	165	278/572	165/490
	10; 16	260	165	267/592	177/501
50	1.6; 2.5; 4.0	230	160	253/594	173/594
	6.3	300	175	254/582	166/582
	10; 16	300	195	276/508	179/605
65	1.6; 2.5; 4.0	290	180	290/549	199/459
	6.3	340	200	339/588	216/466
	10; 16	340	220	339/588	216/466
80	1.6; 2.5; 4.0	310	195	308/726	211/629
	6.3	380	210	308/722	211/609
	10; 16	380	230	355/739	235/621
100	1.6	350	215	364/817	255/708
	2.5; 4.0	350	230	370/823	204/708
	6.3	430	250	376/813	251/688
	10; 16	430	265	381/834	248/834
125	1.6	400	245	427/787	286/646
	2.5; 4.0	400	270	427/787	286/646
	6.3	500	295	431/796	276/641
150	1.6	480	280	465/958	281/788
	2.5; 4.0	480	300	466/958	295/788
	6.3	550	340	449/946	279/776
	10; 16	550	350	474/966	288/785

DN, mm	PN, MPa	L, mm	D, mm	H, mm t: 225 °C / 225–420 °C	H1, mm t: 225 °C / 225–420 °C
200	1.6	600	335	557/1,077	335/872
	2.5	600	360	562/1,082	352/872
	4.0	600	375	562/1,082	352/872
	6.3	650	405	550/1,069	348/867
	10; 16	650	430	611/1,180	328/915
250	1.6	730	405	780/1,083	502/1,361
	2.5	730	425	780/1,083	502/1,361
	4.0	730	445	794/1,083	502/1,375
	6.3	780	470	802/1,088	507/1,383
	10	930	500	818/1,088	507/1,399
	16	950	500	818/1,088	507/1,399
300	1.6	850	460	901/1,626	569/1,295
	2.5	850	485	901/1,626	569/1,295
	4.0	980	510	876/1,619	552/1,295
	6.3	1,010	530	941/1,684	552/1,295
	10	1,100	585	919/1,679	555/1,290
400	1.6	1,100	580	1,160/1,760	727/1,327
	2.5	1,100	610	1,160/1,760	727/1,327
	4.0	1,210	655	1,160/1,760	727/1,327
	6.3	1,220	670	1,167/1,760	733/1,327

* For other DNs, available upon request



400, 500 series valve with ceramic or hard-alloy elements

Features

01

Extended service life of the control unit under difficult operating conditions

Valves are used in harsh operating conditions due to the hardness and chemical resistance of the ceramic control elements.

For instance, when abrasive is present in the flow, cavitation and chemical aggressiveness of the medium, and when unfavorable factors occur simultaneously.

02

Body protection against erosive effects of flow

The high-speed flow collides with the inner surface of the sleeve and does not directly impact the body.

Operating principle

The main operating components in such a throttle assembly are ceramic inserts in the seat [1], plunger [2], and sleeve [3] or solid ceramic/hard-alloy parts.

Zirconium dioxide, silicon carbide, and other materials serve as the starting material for ceramic inserts, etc. Tungsten carbide and chromium carbide are used as materials for hard-alloy inserts.

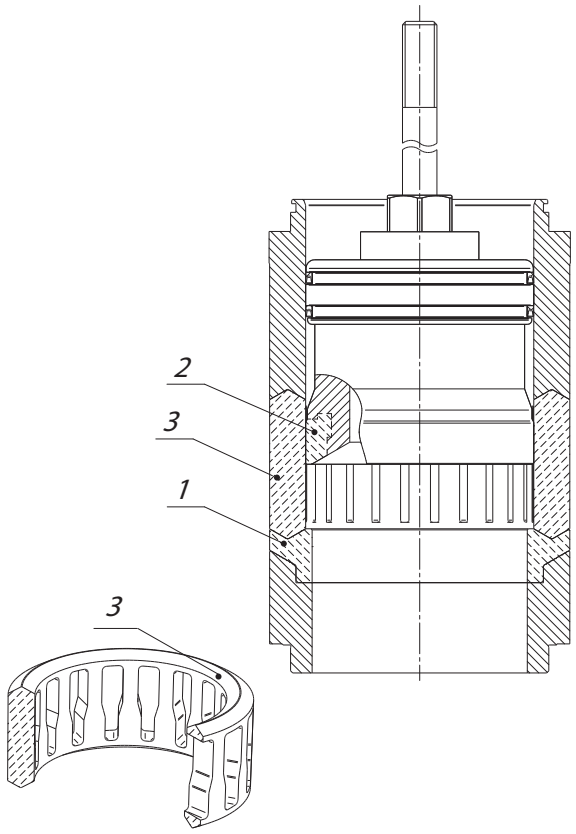
Ceramic products have a hardness of 9 units on the Mohs scale, are not subject to abrasive wear by sand slurries, and due to their chemical neutrality, do not interact with alkalis and acids, except for hydrofluoric acid.

The operating principle of valves with ceramic throttle assemblies is the same as that of standard plunger design valves with metal throttle units.

Despite the ceramics hardness, by carefully fitting the plunger and seat relative to each other, a tightness class of at least B can be achieved for shut-off and multipurpose valves.

If a shut-off function is not required, i.e., the valve is solely a control valve, tightness classes III or IV can be attained.

Throttle units of valves of the same size are fully interchangeable, allowing for the replacement of a standard (non-ceramic) throttle unit with a ceramic throttle unit without removing the valve from the pipeline. Additionally, a ceramic throttle assembly can be ordered for an existing valve.



Technical parameters

Parameter	Value
Nominal diameter, DN, mm	15; 20; 25; 32; 40; 50; 65; 80; 100; 150; 200; 250; 300
Nominal pressure, PN, MPa	1.6; 2.5; 4; 6.3; 10; 16; 25; 32
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances, as well as viscous and crystallizing media
Operating medium temperature, °C	-60 to +250
Climatic design	N, F, NF, MU, T
Connection to pipeline	• Flanged in accordance with GOST, ASME, ANSI B16.5 • Welded • Coupling-type
Types of actuators to be installed	• Pneumatic • Manual • Electric
Body material	Steels according to standards: ASTM A352; ASTM A351; AISI 321; AISI 316Ti; AISI 904L; ASTM A738, etc. Steels according to standards: AISI 904L Alloys according to standards: ASTM A494
Materials of internal parts	Steels according to standards: AISI 420; AISI 321; AISI 316Ti; AISI 630; AISI 904L; AMS 5848; ASTM A743; ASTM A747, etc. Alloys: Ni-based, Ti-based Hard metals: Tungsten Carbide, Chromium Carbide Ceramics: Zirconia, Silicon Carbide
Type of valves	• Control • Multipurpose
Seal type	Ceramic-to-ceramic
Tightness classes	A, B/III, IV, V according to GOST 9544-2015
Regulation characteristics	• Linear • Equal percentage
Flow direction	• Unidirectional • Bidirectional

Flow capacity

Nominal diameter, DN, mm	Flow capacity K_{vy}, m^3/h for control and multipurpose valves
15	0.0008–2.5
20	0.0008–2.5
25	0.0008–10
32	0.1–10
40	0.1–20
50	0.1–32
65	0.1–32
80	0.1–32
100	1.6–32
150	10–400

400, 500 series microflow valve

Multipurpose and control valves are designed for precise control and shut-off of liquid and gaseous media flows with low flow rates (microflows).

DN — Nominal diameter
15 to 25 mm

PN — Nominal pressure
1.6 to 50 MPa

T — Operating medium temperature
-60 to +150 °C

K_{vy} — Nominal flow capacity
0.0008 to 0.032 m^3/h

Unique features

01

Weight and size characteristics

The valves have a relatively small weight and size due to the body being made from a rolled billet and the cover being threaded on.
This simplifies installation, removal, and maintenance.

02

Possibility with standard actuators and automation

The valve does not require the use of actuators with small adjustable strokes. The adjustable stroke for all valve types is 10 mm. This allows for the use of standard pneumatic, manual, and electric actuators, as well as control automation.

03

High durability of the control pair

The incorporation of ceramic and nitrided titanium elements in the design provides resistance against erosion and cavitation, allowing microflow valves to maintain high accuracy and regulation quality over an extended period.

04

Integration with a filter

For uninterrupted operation and increased service life, the valves can be equipped with a specially designed filter.

05

Use of throttle nodes with enhanced flow capacity

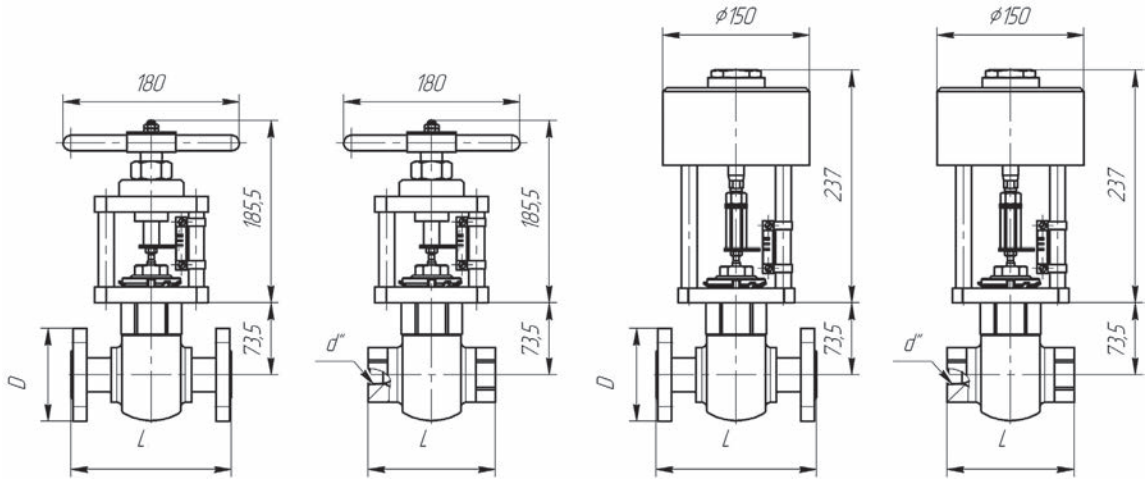
Weight and size parameters and characteristics of regulation remain unchanged.

Technical parameters

Parameter	Value
Nominal diameter, DN, mm	15; 20; 25
Nominal pressure, PN, MPa	1.6; 2.5; 4; 6.3; 10; 16; 25; 32; 50
Flow rate, K_{vy}, m^3/h	0.0008; 0.0016; 0.0032; 0.0063; 0.01; 0.02; 0.16
Operating media	Various liquid and gaseous products, including aggressive ones, free of mechanical impurities, excluding highly viscous and crystallizing substances
Operating medium temperature, °C	-60 to +150
Climatic design, ambient temperature, °C	N, T, F, NF, MU
Connection to pipeline	• Flanged in accordance with GOST, ASME, ANSI B16.5 • Coupling (tapered or cylindrical internal thread)
Types of actuators to be installed	• Pneumatic • Electric • Manual
Body material	Steels according to standards: ASTM A738; AISI 321
Materials of internal parts	Steels according to standards: AISI 321; AISI 316Ti; AISI 630, etc.
Throttle pair material plunger/seat	Steels according to standards: AISI 630 Alloys: Nitrided Ti-based Hard metals: Tungsten Carbide Ceramics: Zirconia, Silicon nitride, Aluminum oxide
Type of valves	• Control • Multipurpose
Seal type	• Metal-to-metal • Ceramic-to-metal • Ceramic-to-ceramic • Metal-to-polymer
Tightness classes	III, IV/A, B per GOST 9544-2015
Regulation characteristics	• Linear • Equal percentage
Flow direction	Unidirectional
Minimum actuation time (with pneumatic actuator), s	1 to 2

Overall and connection dimensions

DN, mm	PN, MPa	D, mm	d,″	L, mm
15	1.6–4.0	95	K1/2", G1/2"	164
20		105	K3/4", G3/4"	
25		115	K1", G1"	
15	6.3	105	K1/2", G1/2"	176
20		125	K3/4", G3/4"	
25		135	K1", G1"	180
15	10; 16	105	K1/2", G1/2"	176
20		125	K3/4", G3/4"	
25		135	K1", G1"	180
15	25; 32; +50	–	K1/2", G1/2"	130
20			K3/4", G3/4"	
25			K1", G1"	



400, 500 series segmental trim valves

400, 500 series segmental trim valves are designed to regulate or cut off the flows of liquid or gaseous media, as well as two-phase flows. The design of the valves is based on the principle that the open valve becomes identical to the diaphragm. This makes the 400, 500 series segmental trim valves an ideal solution when used for contaminated, viscous and crystallizing media.

DN
Nominal diameter
25 to 700 mm

PN
Nominal pressure
1.6 to 4.0 MPa

T°
Operating medium temperature
-60 to +420 °C

Unique features

01

Possibility to use for contaminated, viscous, and crystallizing media

When open, the regulating body of the valve is outside the core of the fluid flow. Thanks to this, there are no conditions for the accumulation of impurities or deposits in the body and their impact on internal parts.

02

Quality regulation

For each valve size, a range of seat diameters can be applied and the segment can be profiled to suit the required flow capacity. All of this provides a wide range of flow capacities for each valve size and allows for quality regulation.

03

Structural rigidity

The structure is designed to withstand the maximum pressure difference on the segment and shaft, respectively.

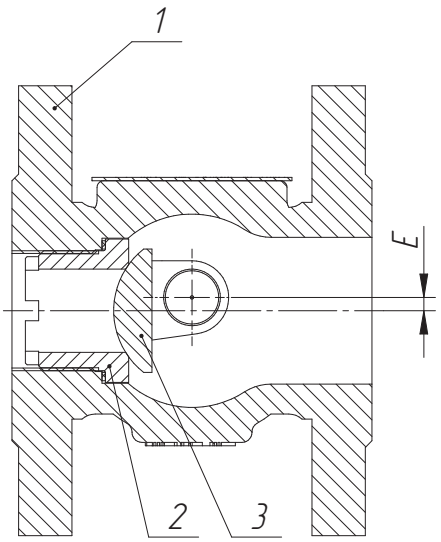
04

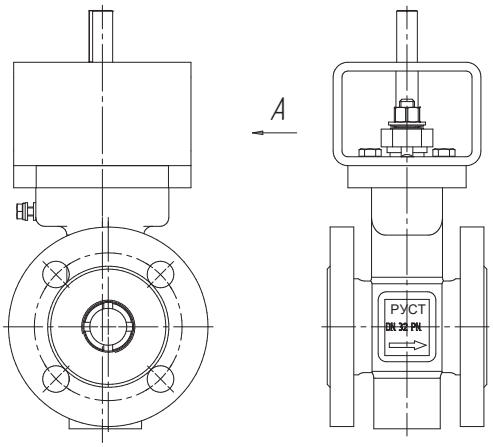
Dimensions

The valve body has no connectors, resulting in a short construction length and low weight. Installation and removal of internal components (seat, plunger) are performed through spigots.

Operating principle

The 400 and 500 series segment trim valves consist of a body [1], a seat [2], and a segment [3], which opens the bore in the seat at an angle ranging 0° to 90° when rotated. The segment rotates eccentrically relative to the seat, allowing frictionless movement of the operating surfaces in relation to each other. The shaft is supported by bearings made from special antifriction materials. The valve seat can be easily removed for replacement. Trim valve components can also be made in two designs: all-metal with cladding or with non-metallic material inserts. The gland seal features a chevron seal made of fluoroplastic or graphite composition.





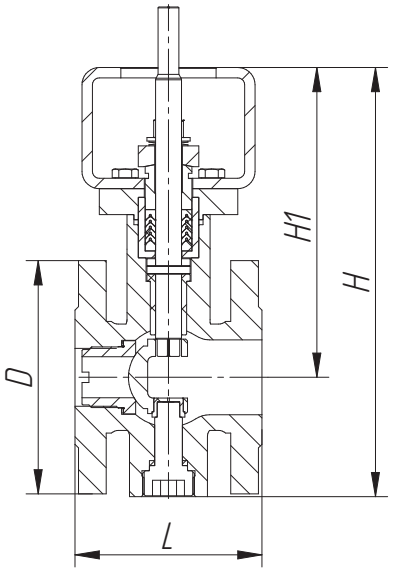
Technical parameters

Parameter	Value
Nominal diameter, DN, mm	25; 32; 50; 80; 100; 150; 200; 250; 300; 400; 500; 600; 700
Nominal pressure, PN, MPa	1.6; 2.5; 4.0
Flow capacity factor K_{vy}	See table
Regulation range	1:100
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances, as well as viscous and crystallizing media
Operating medium temperature, °C	• −60 to +225 standard design • −196 to +420 special design (upon request)
Climatic design, ambient temperature, °C	N, T, F, NF, MU
Connection to pipeline	• Flanged in accordance with GOST, ASME, ANSI B 16.5 • Welded (upon request)
Types of actuators to be installed	• Manual • Pneumatic • Electric
Body material	Steels according to standards: ASTM A352; ASTM A351; ASTM A217; AISI 321; AISI 316Ti; AISI 904L; ASTM A738, etc. Alloys according to standards: ASTM A494
Materials of internal parts	Steels according to standards: AISI 420; AISI 321; AISI 316Ti; AISI 630; AISI 904L; AMS 5848; ASTM A743; ASTM A747, etc. Alloys: Ni-based, Co-based Hard metals: Tungsten Carbide, Chromium Carbide, etc. Ceramics: Zirconia, Silicon Carbide, etc.
Special designs	High-temperature
Seal type	• Metal-to-metal • Metal-to-polymer
Tightness classes	A, B/III, IV according to GOST 9544-2015
Flow direction	• Unidirectional • Bidirectional
Minimum actuation time (with pneumatic actuator), s	12 standard 1–2 optional

Weights, overall and connection dimensions, flow capacity*

DN, mm	PN, MPa	D, mm	L, mm	H, mm	H1, mm	Weight, kg	K_{vy}, m³/h
25	1.6–4.0	115	102	234	174	7	6.3; 10; 16
32		135	108	248	179	9	10; 16; 25
50		160	124	269	189	11	25; 40; 63
80		195	165	339	225	28	63; 100;160
100	1.6	215	194	395	270	31	100; 160; 250
	2.5–4.0	230				33	
150	1.6	280	229	510	305	55	200; 320; 500
	2.5–4.0	300				59	
200	1.6	335	243	565	383	104	320; 500; 800
	2.5	360				112	
	4.0	375				118	
250	1.6	405	297	647	425	151	500; 800; 1,250
	2.5	425				160	
	4.0	445				170	
300	1.6	460	338	730	470	220	800; 1,250; 2,000
	2.5	485				230	
	4.0	510				240	

* For other DNs, available upon request



Symbol structure for 300, 400, 500 series valve

РУСТ® X X X - X XXX X

1 2 3 4 5 6

1

Valve type

3: shut-off
4: multipurpose
5: control

2

Stem seal type

1: gland seal
2: bellows seal

3

Body type

0: linear bore
1: angled

4

Actuator type

1: pneumatic actuator
2: electric actuator
3: manual actuator

5

Climatic design

N, T, F, NF, MU

6

Product placement category

1; 2; 3; 4

The availability of special designs is agreed upon at the time of ordering

The symbol should be followed by a descriptive part with the following information:

- nominal diameter
- nominal pressure
- maximum operating medium temperature
- minimum operating medium temperature (if below the climatic performance value)
- required tightness class
- body material
- nominal flow capacity and flow characteristic (for control and multipurpose valves)
- initial valve position when fitted with a pneumatic actuator

Example of a symbol

РУСТ 410-1 series, NF(1), DN 80, PN1, 6MPa, operating medium: steam, +150 °C, tightness class B, alloy steel, K_{vy}, 50P, NC

900 series axial valve

900 series axial valves are intended for regulating or cutting off the flow of liquid or gaseous media. The valve design is based on the principle of axisymmetric flow of the operating medium.

DN Nominal diameter
80 to 700 mm

PN Nominal pressure
1.6 to 40 MPa

T° Operating medium temperature
-60 to +200 °C

Unique features

01

Weight and size characteristics

900 series axial valve has small weight and compact dimensions, simplifying installation, removal, and maintenance.

02

Absence of valve cover

During assembly, the valve internals are installed through one of its spigots, eliminating the need for a valve cover and thus the need for inspection and maintenance of its fasteners and seals.

03

Repositioning forces on the stem

Due to the pressure-balanced design of the valve stem and plunger, little force is required to actuate the valve, even if there is a high pressure differential across the valve. This makes it possible to use low-power actuators for 900 series valves.

04

Two-way tightness

The plunger seals allow two-way tightness of the fluid flow.

05

Anti-noise and anti-erosion properties

The axial shape of the valve flow does not significantly disturb the flow, which makes axial valves less noisy. Conversely, the calmly moving flow through the valve has no destructive impact on the walls of the body and the outlet section of the pipeline.

06

Flow capacity

The axial-type body has low resistance to flow movement, and the full-actuator design further increases the flow capacity of 900 series valves.

07

Anti-surge regulation

In an emergency, the anti-surge valve can open in less than 2 seconds, thus protecting the compressor from surge phenomena. At the same time, the valve design allows for smooth and precise adjustment of parameters in recirculation and start-up mode.

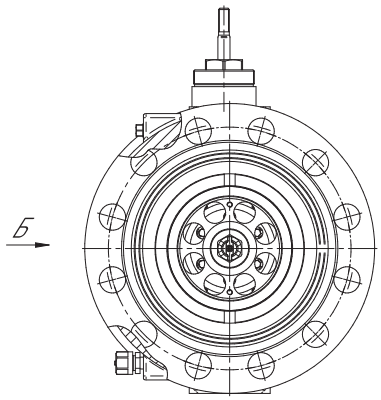
Nomenclature of РУСТ axial valves

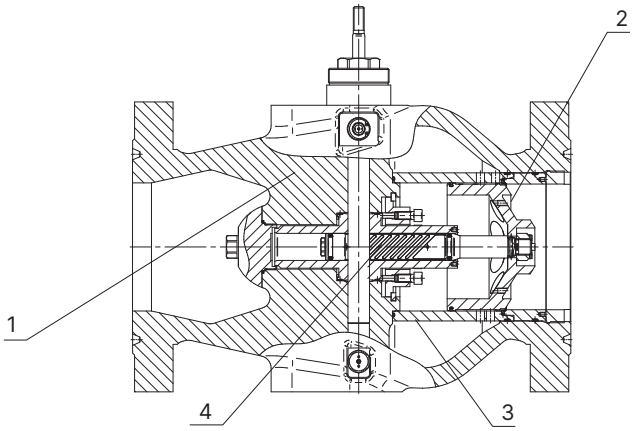
DN \ PN	6.3	10	16	25	40
80	✓	✓	✓	✓	✓
100	✓	✓	✓	✓	✓
150	✓	✓	✓	✓	✓
200	✓	✓	✓	✓	✓
250	✓	✓	✓	✓	✓
300	✓	✓	✓	✓	
400	✓	✓	✓	✓	
500	✓	✓	✓		
600	✓	✓	✓		
700	✓	✓	✓		

Operating principle

The design of 900 series valves is based on the axisymmetric flow principle.
In accordance with this principle, the operating medium flow moves parallel to the valve axis, flowing around the central body [1], where the throttle assembly is installed. The plunger [2] also moves along the valve axis, covering the bore section in the sleeve [3], which is profiled with holes of a specific shape. The shape and size of the orifices determine the valve flow capacity and flow characteristics.

The valve plunger is moved by a rack and pinion mechanism [4]. The rack assembly is placed in a grease-filled cavity within the middle of the body and is protected from the operating medium by seals, i.e., it is under atmospheric pressure. The racks are made of special high-strength steels, which, combined with lubrication, ensure their long-term operation.

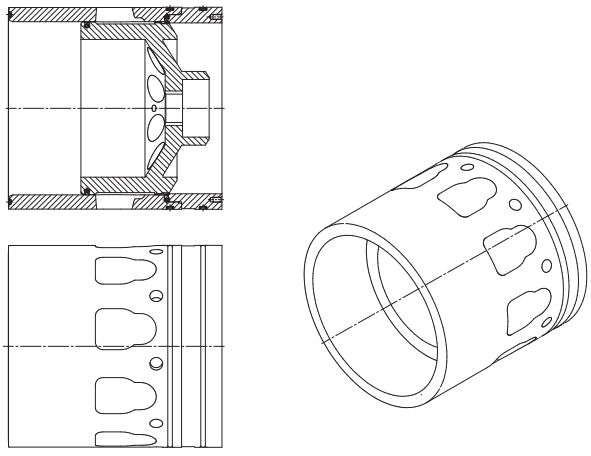




Valve types

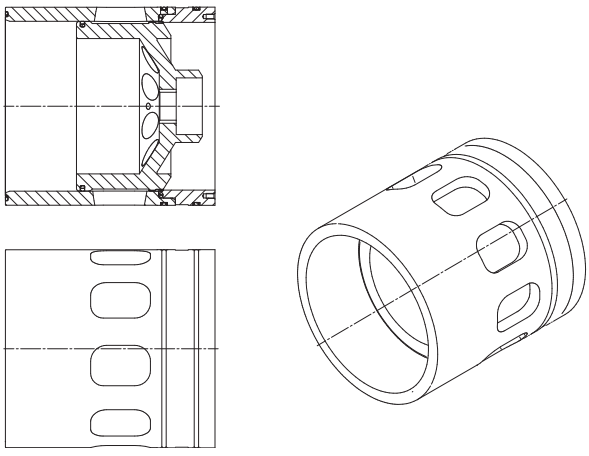
Multipurpose and control valves

The valve sleeve features holes of specific shape and size, determining the flow capacity and flow characteristic type.



Shut-off (cut-off) valves

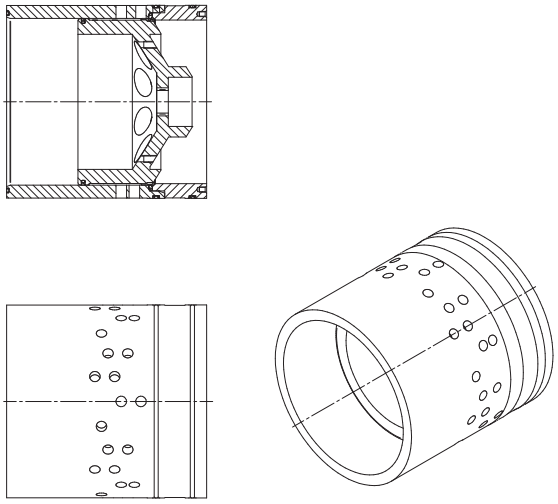
The valve sleeve is designed with maximum area windows to minimize flow resistance.



Special designs

Anti-cavitation and anti-noise designs

To prevent cavitation in valves when operating with liquid products and to reduce noise levels when working with gaseous media, the control and multipurpose valve assembly sleeve is perforated with small holes. Dividing the flow into thin streams significantly speeds up energy dissipation during throttling, resulting in the valve anti-noise and anti-cavitation properties.



Erosion-resistant design

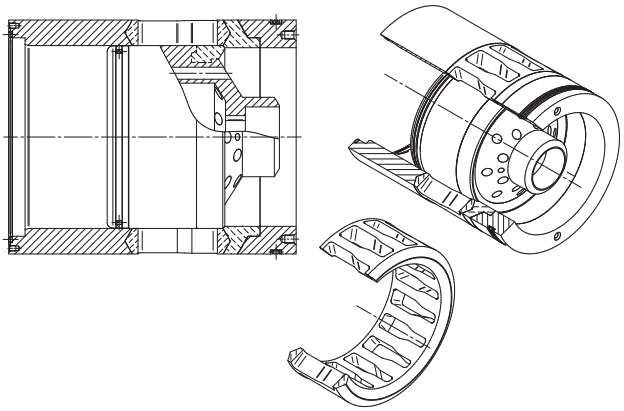
This is used for regulating chemically aggressive media flows, requiring special materials for the valve internal parts that can withstand the high-velocity impact of a specific medium, such as ceramics or special alloys. Both whole components and ceramic or hard-alloy inserts are used.

Hydrogen sulfide resistant design

Applied in regulating media containing hydrogen sulfide, where valve components require materials in compliance with NACE MR0175 and other regulatory documents.

Abrasion-resistant construction

To enhance the resistance of internal components with significant abrasive content in the operating medium, their surfaces can undergo surface hardening. For non-aggressive media, all surfaces of the sleeve, plunger, and seat are subjected to nitriding. For aggressive media, plasma spraying of ceramic materials is used. Additionally, both whole components and inserts are manufactured from ceramics or hard alloys.



Technical parameters

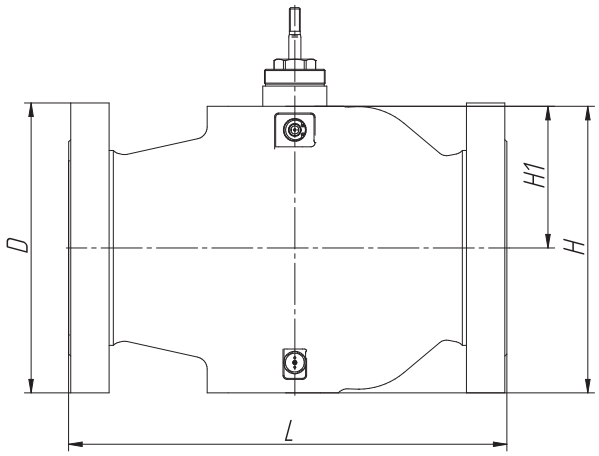
Parameter	Value
Nominal diameter, DN, mm	80; 100; 125; 150; 200; 250; 300; 350; 400; 450; 500; 700
Nominal pressure, PN, MPa	1.6; 2.5; 4.0; 6.3; 10; 16; 25; 32; 40
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances, excluding particularly viscous and crystallizing media
Operating medium temperature, °C	• -60 to +100 standard design • -60 to +200 special design (upon request)
Climatic design	N, T, F, NF, MU
Placement category	1; 2; 3; 4
Connection to pipeline	• Flanged in accordance with GOST, ANSI B 16.5 • Welded
Types of actuators to be installed	• Manual • Pneumatic • Electric
Body material	Steels according to standards: ASTM A352; ASTM A351; AISI 321; AISI 316Ti; AISI 904L; ASTM A738, etc. Steels according to standards: AISI 904L Alloys according to standards: ASTM A494
Materials of internal parts	Steels according to standards: AISI 420; AISI 321; AISI 316Ti; AISI 904L, etc. Alloys: Ni-based, Co-based, Ti-based, etc. Hard metals: Tungsten Carbide, Chromium Carbide, etc. Ceramics: Zirconia, Silicon Carbide, etc.
Type of valves	• Control • Multipurpose • Shut-off
Special designs	• Cavitation-resistant • Anti-pumping • Anti-noise • Abrasion-resistant • Erosion-resistant • Hydrogen sulfide resistant • Underground
Seal type	• Metal-to-metal • Metal-to-polymer
Tightness classes	A, B/III, IV according to GOST 9544-2015
Regulation characteristics	• Linear • Equal percentage
Flow direction	• Unidirectional • Optional
Minimum actuation time (with pneumatic actuator), s	12 standard, 1–2 upon request

Flow capacity

Nominal diameter, DN, mm	Flow capacity K_{vy}, m^3/h for valves	
	control and multipurpose	shut-off
80	25–125	160
100	40–200	250
150	80–400	500
200	125–630	800
250	200–1,000	1,250
300	320–1,600	2,000
400	500–2,500	3200
500	800–4,000	5,000

Weights, overall and connection dimensions
(flanged connection)

DN, mm	PN, MPa	L, mm	D, mm	H, mm	H1, mm	Weight, kg
80	1.6	380	210	226	113	53
	10–16		230			57
100	6.3	430	250	263	133	84
	10–16		265			88
	25	549	310	379	210	163
150	6.3	550	340	330	155	175
	10–16		350			180
	25	705	395	414	194	351
200	6.3	650	405	425	215	310
	10–16		430			325
250	63	700	470	508	283	428
	10–16		500			460
300	6.3	780	530	640	365	660
	10–16		585			714
400	6.3	1,000	670	865	430	1,200
	10		715			1,260
	16	1,032	705			1,370
500	6.3	1,200	800	935	515	1,920
	10	1,334	815			2,085
	16		855			2,180



Symbol structure

РУСТ® XXX - X X X

1 2 3 4

1

Valve type

930: shut-off
940: multipurpose
950: control

2

Actuator type

1: pneumatic
2: electric
3: manual

3

Climatic design

T, N, F, NF, MU

4

Product placement category

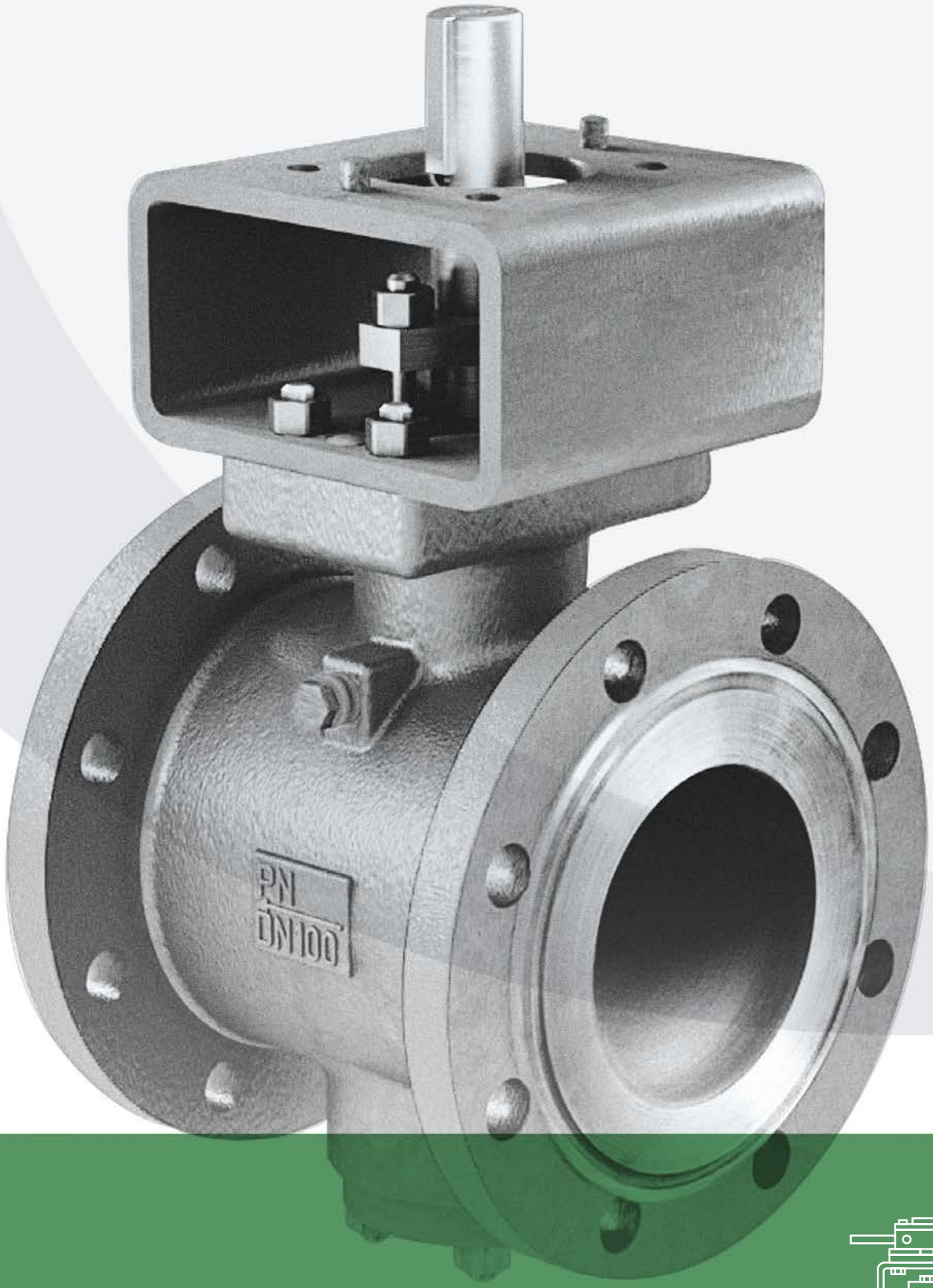
1; 2; 3; 4

The symbol should be followed by a descriptive part with the following information:

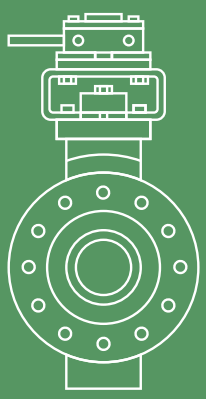
- nominal diameter
- nominal pressure
- nominal flow capacity and flow rate characteristic (for control and multipurpose valves)
- operating medium
- minimum operating medium temperature (if below the climatic performance value)
- maximum operating medium temperature
- required tightness class
- body material
- initial valve position when fitted with a pneumatic actuator
- special design, if provided
- connection to pipeline

Example of a symbol

Multipurpose valve, РУСТ 940-2 series, NF(1), DN100, PN160, K_{vy} 100, operating medium: gas, 100 °C, tightness class A, alloy steel, NC, flanged



Butterfly valves



800 series butterfly valve

Series 800 butterfly valves are designed for regulating and/or cutting off the flow of liquid or gaseous media. The valve design incorporates the triple eccentricity principle, which ensures high tightness even for metal-to-metal seals. This makes 800 series valves an ideal solution for shut-off and multipurpose applications where the use of elastomers and plastics is not acceptable.

DN
Nominal diameter
80 to 700 mm

PN
Nominal pressure
1.6 to 4.0 MPa

T°
Operating medium temperature
-196 to +450 °C

Unique features

01

Reliable and long-lasting seal

Provides Class A tightness across a wide temperature range and is suitable for both cryogenic and high-temperature media. Additionally, the metal-to-metal seal allows the valve to function as control devices.

02

High flow capacity value

Valves have a high flow capacity, allowing their use as shut-off devices in situations where hydraulic losses need to be minimized.

03

Maintainability

When the valve is removed from the pipeline, it can be serviced and repaired. Repairs are carried out by replacing the seat or disc.

04

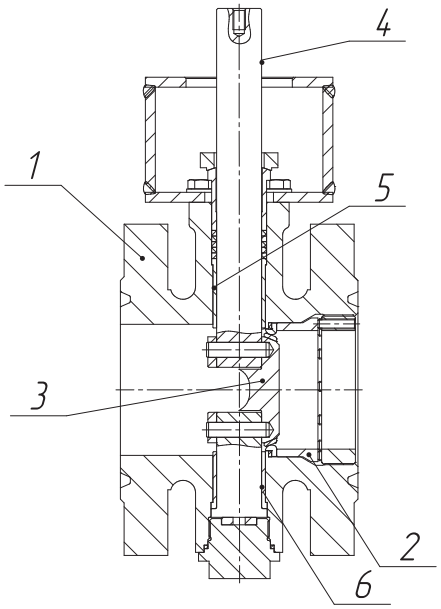
Compact dimensions

Compact construction lengths enable the use of butterfly valves in areas with limited installation space.

Operating principle

Butterfly valves are designed based on the triple-eccentric principle, which ensures that sealing surfaces separate from each other without negative interaction (deformation, friction, etc.) when opened. During closure, surface contact occurs only at the very last moment. This motion kinematics provides the seal with a high service life. To obtain high tightness, a resilient seal is also used in three-eccentric closures. This compensates for geometric inaccuracies and ensures a tight and leak-free fit of the sealing surfaces.

The valves consist of a body [1], seat [2], and disc [3], which rotates 0 to 90° when opened, allowing bore through the seat. The disc is mounted on a shaft [4], supported by bearings [5] and [6], made from special anti-friction materials. The disc material is made of corrosion-resistant steel. The disc sealing surface is hardened by applying a stellite layer through plasma cladding. The valve seat, installed in the body, can be dismantled for replacement. The seat is made from hard corrosion-resistant steel.



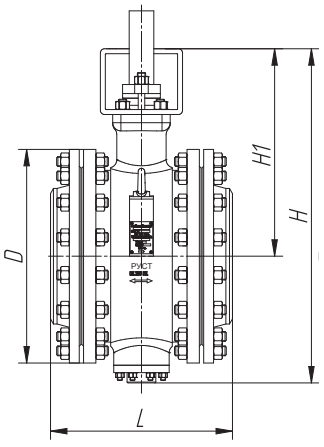
Technical parameters

Parameter	Value
Nominal diameter, DN, mm	80; 100; 125; 150; 200; 250; 300; 350; 400; 500; 600; 700
Nominal pressure, PN, MPa	1.6; 2.5; 4.0
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances
Operating medium temperature, °C	• -60 to +350 standard design • -196 to +450 special design (upon request)
Climatic design	N, T, F, NF, MU
Connection to pipeline	Flanged in accordance with GOST, ANSI B16.5
Types of actuators to be installed	• Manual • Pneumatic • Electric
Body material	Steels according to standards: ASTM A352; ASTM A351; ASTM A217; AISI 321; AISI 316Ti; AISI 904L; ASTM A738, etc. Steels according to standards: AISI 904L Alloys according to standards: ASTM A494
Materials of internal parts	Steels according to standards: AISI 420; AISI 321; AISI 316Ti; AISI 630; AISI 904L; AMS 5848; ASTM A743; ASTM A747, etc. Alloys: Ni-based, Co-based, etc. Hard metals: Tungsten Carbide, Chromium Carbide, etc. Ceramics: Zirconia, Silicon Carbide, etc.
Design features	• Triple-eccentric design • Fire-resistant design
Special designs	• High-temperature • Cryogenic • Control
Seal type	• Metal-to-metal • Metal-to-polymer
Tightness classes	As per GOST 9544-2015
Flow direction	Unidirectional
Minimum actuation time (with pneumatic actuator), s	12 standard, 1–2 optional

Weights, overall and connection dimensions, flow capacity*

DN, mm	PN, MPa	L, mm	D, mm	H, mm	H1, mm	Weight, kg	K_{vy}, m^3/h
80	1.6–4.0	180	195	310	210	20	200
100	1.6	190	215	355	225	25	320
	2.5		230			28	
	4.0		230			28	
150	1.6	140	280	375	240	37	1,000
	2.5	210	300	395	260	44	
	4.0	230	300	395	260	50	
200	1.6	230	335	475	296	57	1,600
	2.5	230	360			65	
	4.0	240	360			75	
250	1.6	250	405	536	329	87	2,700
	2.5	250	425			106	
	4.0	290	445			126	
300	1.6	270	460	589	355	115	5,400
	2.5	270	485	589	355	128	
	4.0	310	510	635	380	164	
350	1.6	290	520	813	505	250	6,500
	2.5	290	550			275	
	4.0	310	570			275	
400	1.6	310	580	866	538	275	7,700
	2.5	310	610			300	
	4.0	350	655			391	
500	1.6	350	710	981	576	361	16,000
	2.5	350	730	1,017	622	430	
	4.0	390	755	1,017	622	518	
600	1.6	390	840	1,200	625	696	23,000
700	1.6	430	895	1,330	775	778	27,000

* Custom weight and dimensions are available upon special request



Symbol structure

РУСТ® X X X - X XXX X

1 2 3 4 5 6

1

Item

8: butterfly valve

2

Serial number

0: triple-eccentric
1: special design

3

Type

0: shut-off
1: control

4

Actuator type

1: pneumatic actuator
2: electric actuator
3: manual actuator

5

Climatic design

T, N, F, NF, MU

6

Product placement category

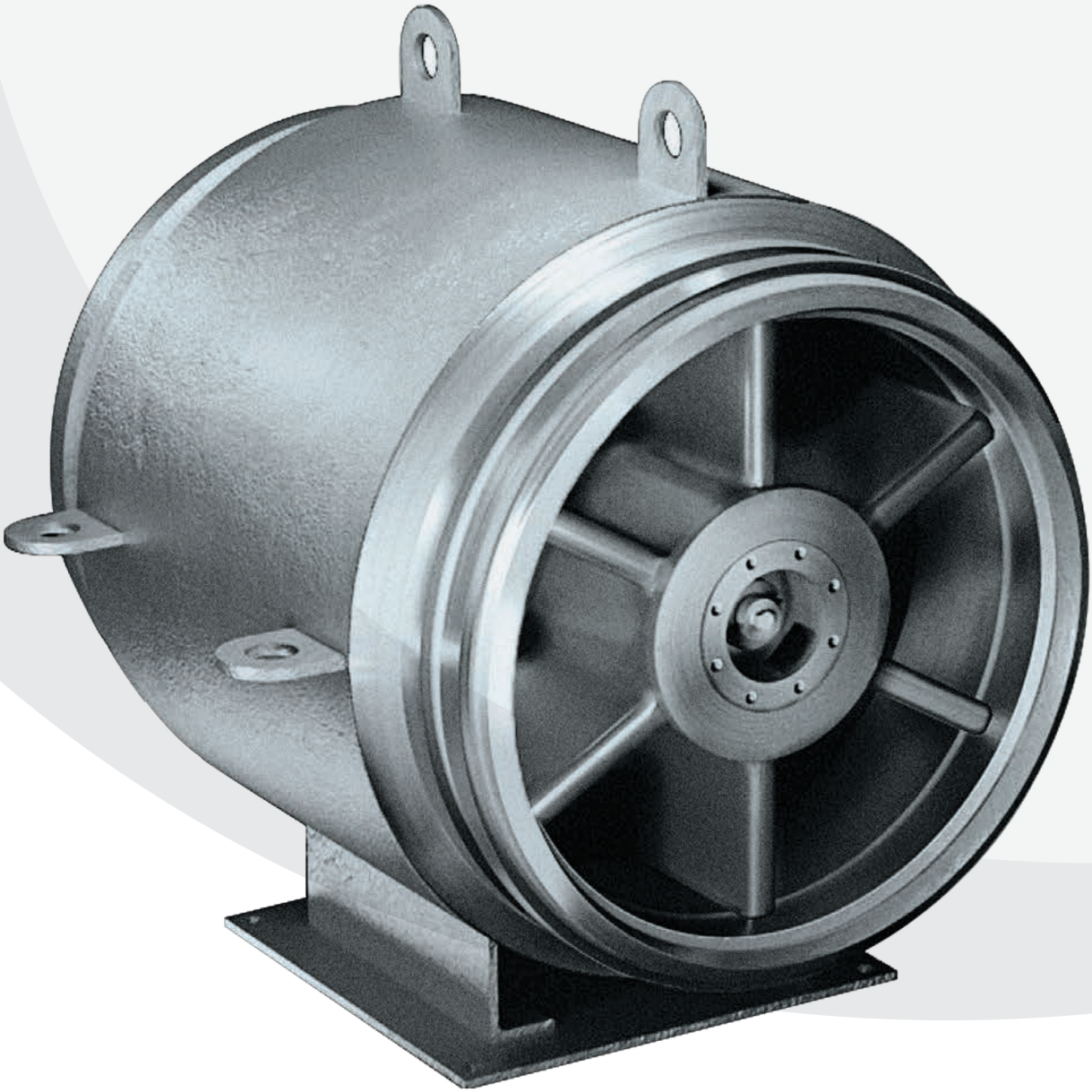
1; 2; 3; 4

The symbol should be followed by a descriptive part with the following information:

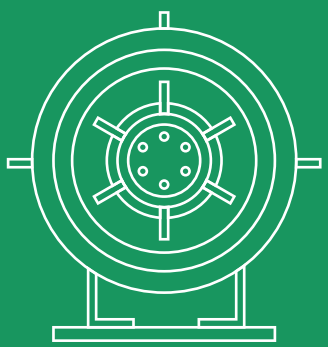
- nominal diameter
- nominal pressure
- nominal flow capacity (for control)
- operating medium
- minimum operating medium temperature (if below the climatic performance value)
- maximum operating medium temperature
- required tightness class
- body material
- special design, if needed
- initial position when fitted with a pneumatic actuator
- connection to pipeline

Example of a symbol

PYCT 801-1 series butterfly valve , NF(1), DN200 PN1.6 MPa, operating medium: steam, +150 °C, tightness class IV, alloy steel, NC



Check valves



960 series check valve

960 series check valves are designed for automatic prevention of reverse flows of liquid or gaseous media. The valve construction is based on the principle of axisymmetric flow discharge.

DN Nominal diameter
25 to 1,000 mm

PN Nominal pressure
1.6 to 32 MPa

T° Operating medium temperature
-60 to +100 °C standard design,
-196 to +350 °C special design

Unique features

01

Non-impact closing

Due to the axial design of the flow part, opening/closing the valve does not require large movements of the locking element (plate), which, combined with its low mass, does not create conditions for strong acceleration of the plate and closing it with an impact. This reduces wear on the valves.

02

Weight and size characteristics

Thanks to the axial valve design and the absence of hydraulic dampers, the check valve has relatively small dimensions and weight. This simplifies installation, removal, and transportation-related tasks.

03

Low pressure drop needed for trim opening initiation

As the plate moves back, a low-force spring is sufficient.

04

Minimum flow needed to keep the valve fully open

Achieved by using a flow section profiled with the Venturi effect.

05

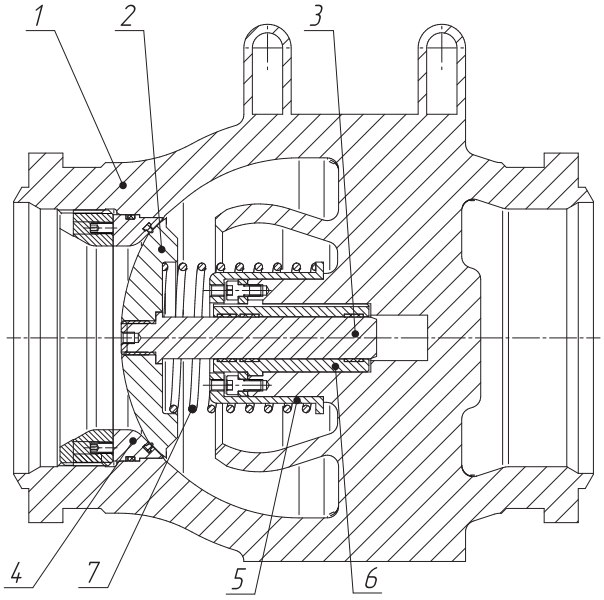
Tightness similar to a shut-off valve

Attained by installing a secondary soft seal in the valve seat.

Operating principle

Valves are made with weld sockets or welded flanges and consist of body [1], plate [2] with stem [3], seat [4], sleeve [5], guide bushing with anti-friction inserts [6], spring [7]. In the absence of medium flow through the valve, the plate is pressed against the seat (in the "closed" position). When flow occurs in the forward direction, the plate is pushed away from the seat by pressure. In the fully open position, a vacuum is created inside the fairing due to the Venturi principle, reliably holding the plate open even at low flow velocities.

Upon flow cessation or reversal, the valve automatically closes. During movement, the valve stem slides along the anti-friction guides installed in the sleeve, which can operate even under "dry" friction conditions.



Technical parameters

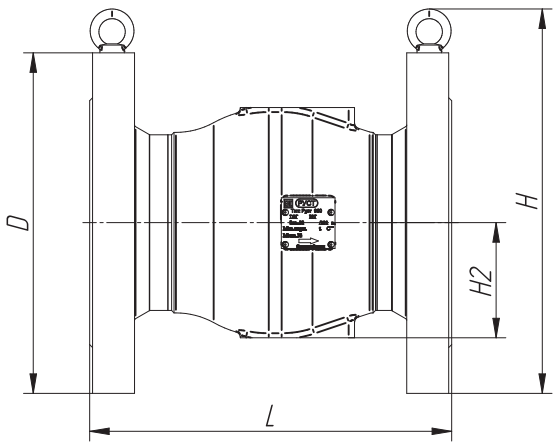
Parameter	Value
Nominal diameter, DN, mm	80; 100; 150; 200; 250; 300; 400; 700; 1,000
Nominal pressure, PN, MPa	1.6; 2.5; 4.0; 6.3; 8.0; 10; 16; 25; 32
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances, excluding particularly viscous and crystallizing media
Operating medium temperature range, °C	• -60 to +100 standard design • -196 to +350 special design (upon request)
Climatic design	N, T, F, NF, MU
Body material	Steels according to standards: ASTM A352; ASTM A351; AISI 321; AISI 316Ti; AISI 904L; ASTM A738, etc. Steels according to standards: AISI 904L Alloys according to standards: ASTM A494
Materials of internal parts	Steels according to standards: AISI 420; AISI 321; AISI 316Ti; AISI 630; AISI 904L; AMS 5848; ASTM A743; ASTM A747 Alloys: Ni-based, Co-based
Seal type	• Metal-to-polymer • Metal-to-metal
Tightness class	As per GOST 9544-2015
Valve hydraulic resistance factor, not exceeding	4–5
Connection to pipeline	• Flanged in accordance with GOST, ANSI B16.5 • Welding-type
Valve installation	• Overhead • Underground

Weights, overall and connection dimensions*

Flanged connection

DN, mm	PN, MPa	L, mm	D, mm	H2, mm	Weight, kg
80	4.0	254	195	76	23
	6.3–10		210		26
	16		230		30
100	4.0	305	230	85	29
	6.3		250		38
	10–16		265		42
150	4.0	371	300	118	60
	6.3–10		340		78
	16		350		93
200	4.0	508	375	160	139.5
	6.3–10		405–430		155
	16	600	430	175	176
250	4.0	560	445	185	218
	6.3–10		470–500		236
	16	635	500	190	255
300	4.0	622	510	240	311
	6.3–10	698	530–585		336
	16	765	585	255	352
400	4.0	628	655	260	562
	6.3–10	711	670–715		586
	16		715		610

* For other DNs, available upon request



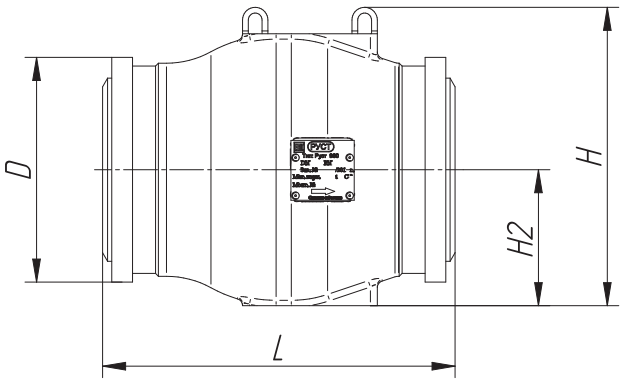
Flanged connection

Weights, overall and connection dimensions*

Welding connection

DN, mm	PN, MPa	L, mm	D, mm	H2, mm	Weight, kg
100	6.3	305	250	85	38
	10–16		265		42
150	6.3–10	306	195	118	45
	16				
200	6.3–10	508	285	160	126
	16				
250	6.3–10	560	320	185	195
	16				
300	6.3–10	648	385	255	340
	16				
400	6.3–10	610	485	255	445
	16				
700	4.0–8.0	1,000	765	420	1,450

* For other DNs, available upon request



Welding connection

Symbol structure

РУСТ® XXX - XXX X

1 2 3

1

Valve type

960: axial check valve

2

Climatic design

T, N, NF, MU

3

Product placement category

1; 2; 3; 4

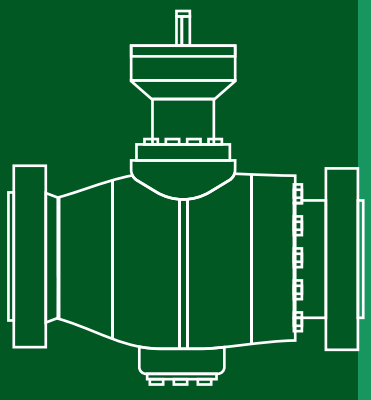
The symbol should be followed by a descriptive part with the following information:

- nominal diameter
- nominal pressure
- operating medium
- minimum operating medium temperature (if below the climatic performance value)
- maximum operating medium temperature
- required tightness class
- body material
- connection to pipeline: flanged, weldable
- valve installation type: overhead, underground

Example of a symbol

РУСТ 960 series check valve: NF(1), DN700, PN80, operating medium: gas, +120 ºС, tightness class B, alloy steel, aboveground weldable installation

Ball valves



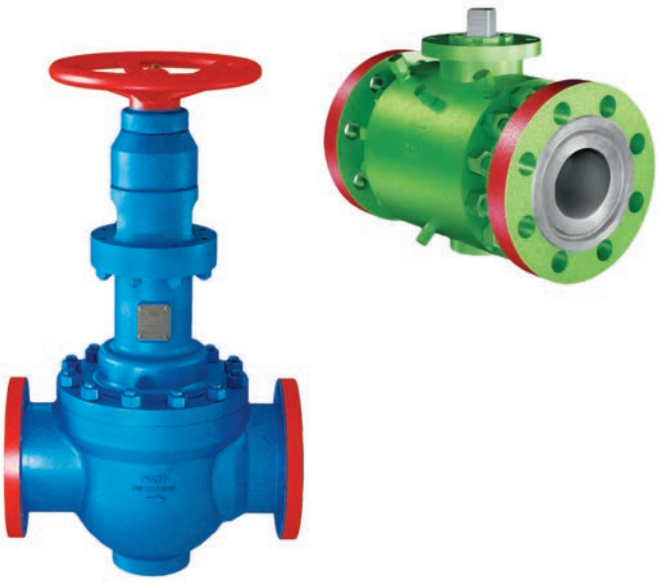
600 series ball valve

600 series ball valves are designed for hermetic sealing, regulating liquid or gaseous media flows. Valves are produced in two designs: with rotary and rising stem.

DN Nominal diameter
10 to 700 mm

PN Nominal pressure
1.6 to 40 MPa

T Operating medium temperature
-196 to +600 °C



Unique features

01

Variability

Full bore / part bore.
High cyclicality, ability to work with contaminated, viscous, aggressive media, and at high and low temperatures

02

Possibility of using valves for regulation due to original design solutions

03

Possibility of metal-to-metal sealing

Unique production technologies enable high-quality and reliable metal-to-metal sealing for heavy-duty operating conditions:

- valve operation during regulation;
- design for heavily contaminated media.

04

Maintainability

Presence of connectors in the body allows for repair and maintenance work

Nomenclature of РУСТ ball valves with rotary stem

DN \ PN	1.6	2.5	4.0	6.3	10	16	25	40
10	✓	✓	✓	✓	✓	✓	✓	✓
15	✓	✓	✓	✓	✓	✓	✓	P
20	✓	✓	✓	✓	✓	✓	✓	P
25	✓	✓	✓	✓	✓	✓	✓	P
32	✓	✓	✓	✓	✓	✓	✓	P
40	✓	✓	✓	✓	✓	✓	✓	P
50	✓	✓	✓	✓	✓	✓	✓	P
65	✓	✓	✓	✓	✓	✓	✓	P
80	✓	✓	✓	✓	✓	✓	✓	P
100	✓	✓	✓	✓	✓	✓	✓	P
125	✓	✓	✓	✓	✓	✓	✓	P
150	✓	✓	✓	✓	✓	✓	✓	P
200	✓	✓	✓	✓	✓	✓	✓	P
250	✓	✓	✓	✓	✓	✓	P	
300	✓	✓	✓	✓	✓	✓	P	
400	✓	✓	✓	✓	✓	✓	P	
500	✓	✓	✓	✓	✓	✓	P	
600	✓	✓	✓	✓	✓	P		
700	P	P	P	P	P			

Nomenclature of РУСТ ball valves with rising stem

DN \ PN	1.6	2.5	4.0	6.3	10	16	25	40
25	✓	✓	✓	✓	✓	✓	P	P
32	✓	✓	✓	✓	✓	✓	P	P
40	✓	✓	✓	✓	✓	✓	P	P
50	✓	✓	✓	✓	✓	✓	P	P
65	✓	✓	✓	✓	✓	✓	P	P
80	✓	✓	✓	✓	✓	✓	P	P
100	✓	✓	✓	✓	✓	✓	P	P
125	✓	✓	✓	✓	✓	✓	P	P
150	✓	✓	✓	✓	✓	✓	P	P
200	✓	✓	✓	✓	✓	✓	P	P
250	✓	✓	✓	✓	✓	✓	P	
300	✓	✓	✓	✓	✓	P		
400	✓	✓	✓	✓	P			
500	✓	✓	✓	P				

" P: part bore valve

Ball valve with rotary stem

600 series ball shut-off and regulating valves are designed for hermetic closure and regulation of liquid or gaseous media flows. Valves are produced with a body featuring a split or double split in a plane perpendicular to the pipeline axis. The onnector is tightened with bolts and can be used during valve maintenance.

DN
Nominal diameter
50 to 700 mm

PN
Nominal pressure
1.6 to 40 MPa

T
Operating medium temperature
-196 to +350 °C

Unique features

01

Full bore

The hole in the ball matches the size of the pipe bore. This results in minimal hydraulic resistance for the valve. The valve allows for the passage of scraper elements. A more cost-effective part bore design is also possible.

02

Meets all current requirements

Fire-resistance, grease injection into seats and spindle, anti-static device, built-in stops in end positions, locking and drainage function in closed position, anti-vibration stem design, double gland with tightening capability, ability to replace seals during operation, one- or two-way sealing for each seat.

03

Can be used as a control valve

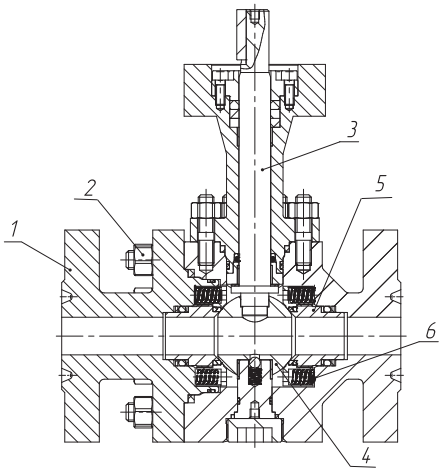
The ball special design enables the necessary flow characteristics and capacity for quality regulation.

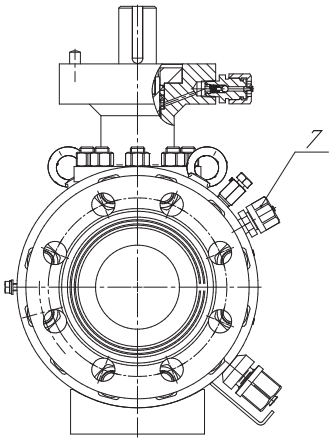
Operating principle of the ball valve with rotary stem

The 600 series ball valves are constructed based on the ball-in-supports principle, ensuring minimal torque requirements on the shaft. The floating ball principle can also be applied for specific sizes. The valve body [1] features a connector or two stud-connected [2] connectors, allowing for easy maintenance when removing the valve from the pipeline. The valve shaft [3] also serves as a upport for the ball and includes ejection protection.

Valve design incorporates a static electricity removal device, double gland, and fire-resistant components. The valve ball [4] can be made from hard corrosion-resistant steel with a wear-resistant coating. The ball bore size corresponds to the pipeline bore size.

Valve seats [5] are made from corrosion-resistant steels with non-metallic inserts or wear-resistant coatings for seal design of metal-to-metal. Valve seats are pressed against the ball by springs [6] and differential pressure, ensuring two-way tightness throughout the entire operating pressure range. Holes with fittings [7] are also made in the body for injecting sealing grease into the seats, which can be used to restore valve tightness in emergency situations.





Special designs

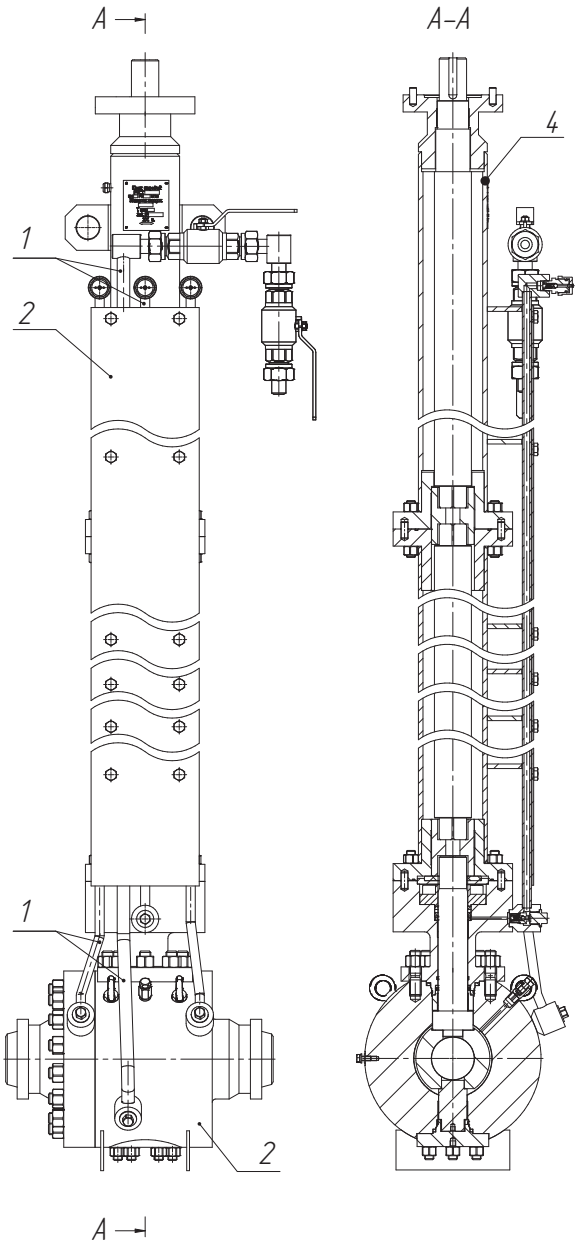
Underground design

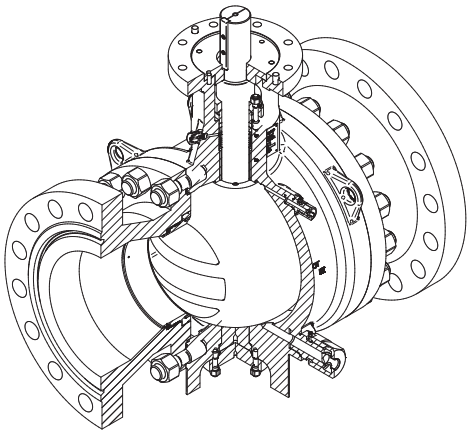
For underground installation, the valve is designed with an extended post on which the actuator is mounted. Fittings and tubing [1] for grease injection, tightness testing, and pressure relief are hidden under a special cover [2] and led into the service area above ground. The valve body [3] and stand [4] are coated with a special compound, providing long-term protection of the metal surface in contact with the ground.

Control design

Used for operation on contaminated media, as well as when precise equal-percentage characteristics and high flow capacity are required.

In this design, the ball plug has a special internal geometry.





Technical parameters

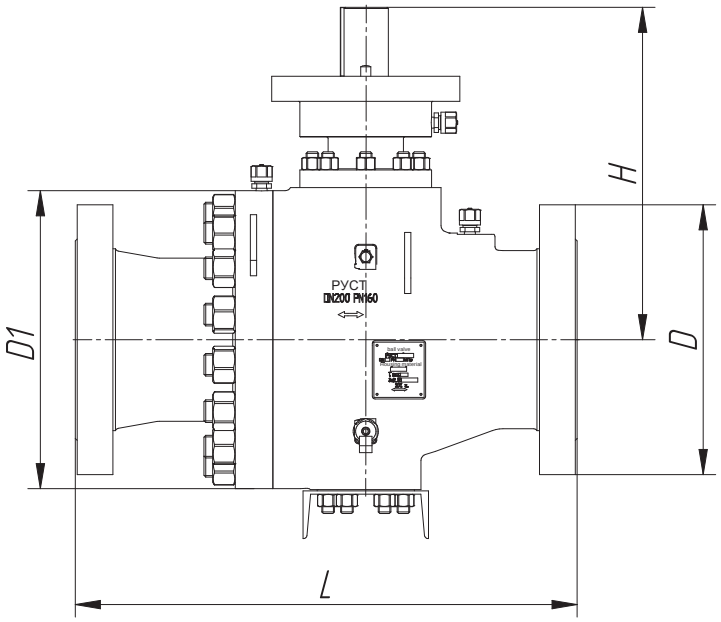
Parameter		Value
Nominal diameter, DN, mm		50; 65; 80; 100; 125; 150; 200; 250; 300; 400; 500; 700
Nominal pressure, PN, MPa		1.6; 2.5; 4; 6.3; 10; 16; 25; 32; 40
Operating media		Gaseous and liquid products, including aggressive and solid-containing substances.
Operating medium temperature, °C		-60 to +100 standard design −60 to +225 high-temperature design -60 to +350 special high-temperature design down to -196 cryogenic design
Climatic design		N, T, F, NF, MU
Connection to pipeline		• Flanged in accordance with GOST, ANSI B16.5 • Welded
Types of actuators to be installed		• Pneumatic • Manual • Electric • Pneumohydraulic
Body material		Steels: plain and alloy steel; structural steel, steel for castings, etc. Steels according to standards: AISI 904L Alloys according to standards: ASTM A494
Materials of internal parts		Steels according to standards: AISI 420; AISI 321; AISI 316Ti; AISI 630; AISI 904L; AMS 5848; ASTM A743; ASTM A747, etc. Alloys: Ni-based, Co-based Hard metals: Tungsten Carbide, Chromium Carbide Ceramics: Zirconia, Silicon Carbide
Design features		• Full bore • Gland seal duplication • Antistatic device • Fire-resistant design • Sealing lubricant supply (for DN>80) • Fire-resistant design
Special designs		• Underground • Control
Seal type		• Metal-to-metal • Metal-to-polymer
Tightness classes		A, B per GOST 9544-2015; IV, V per GOST 9544-2015 (for regulating valves)
Flow direction		Bidirectional
Minimum actuation time	with pneumatic actuator, s	12, for standard configuration
	Shut-off valves	1–2, upon request
	Regulating valves	Depending on the used attachment, information is available upon request

Weights, overall and connection dimensions (without actuator*)**

DN, mm	PN, MPa	Actuator flange according to ISO 5211	L, mm	D, mm	D1, mm	H, mm	Weight, kg
50	1.6–4.0	7	230	160	180	193	40
	6.3	10	292	175	205	194	52
	10		292	195	205	194	55
	16		350	195	245	265	100
	25		368	215	245	265	102
80	1.6–4.0	10	310	195	205	229	55
	6.3	12	356	210	256	301	77
	10		356	230	256	301	80
	16		450	230	256	301	120
	25	14	470	265	310	345	160
100	1.6	12	350	215	275	288	76
	2.5–4.0		350	230	275	288	80
	6.3	14	432	250	275	315	140
	10		432	265	275	315	146
	16		520	290	330	350	220
	25	16	546	310	330	350	265
150	1.6	10	480	280	325	329	160
	2.5–4.0	14	480	300	380	370	250
	6.3	16	559	340	380	402	345
	10		559	350	380	402	350
	16		610	350	360	426	290
	25	25	705	395	460	511	640
200	1.6	14	457	335	400	385	231
	2.5		600	360	430	418	310
	4.0		600	375	430	418	315
	6.3	16	660	405	475	436	483
	10		660	430	475	436	489
	16	25	800	430	475	530	560
	25	30	832	485	540	625	1,140
250	1.6	14	730	405	545	491	540
	2.5		730	425	545	491	546
	4.0	16	730	445	545	555	580
	6.3	25	787	470	550	580	730
	10		787	500	550	580	745
	16	30	900	500	560	610	995

* Dimensions and weights of valves with actuators are provided upon request
** Weights, overall and connection dimensions for DN less than 50 mm are available upon request

DN, mm	PN, MPa	Actuator flange according to ISO 5211	L, mm	D, mm	D1, mm	H, mm	Weight, kg
300	1.6	16	610	460	590	546	610
	2.5		648	485	590	546	640
	4.0		648	510	590	546	660
	6.3	25	838	530	625	656	960
	10	30	838	585	625	688	1,130
	16		965	585	640	672	1,260
400	1.6	25	762	580	780	660	1,540
	2.5		838	610	780	690	1,650
	4.0		838	655	780	690	1,690
	6.3	30	991	670	800	774	2,230
	10	35	991	715	800	774	2,310
	15	40	1,130	705	845	874	2,870
500	1.6	25	914	710	940	760	2,630
	2.5	30	991	730	940	790	2,890
	4.0		991	755	940	790	2,930
	6.3	35	1,194	800	940	840	3,350
	10	40	1,194	815	985	890	3,910
	15		1321	855	1,060	992	5,200



RSBV rising stem ball valve

RSBV rising stem ball valves are designed for cutting off or blocking liquid and gaseous media flows, including aggressive ones and those containing mechanical impurities, and functions as a shut-off device with a special two-stage ball plug movement.
This enables the use of these shut-off devices in the most critical positions where even minimal leaks are unacceptable, let alone equipment failures.

DN — Nominal diameter
25 to 500 mm

PN — Nominal pressure
1.6 to 40 MPa

T — Operating medium temperature
-196 to +600 °C

Unique features

01

High cyclic resistance

Reliable operation with numerous actuations due to reduced wear of sealing surfaces.

02

High-temperature or low-temperature applications enabled by the absence of elastomeric seals in the design.

03

Reliable metal-to-metal seal, even for media with large amounts of mechanical impurities.

04

High maintainability of the design

The top connector design allows for removal, repair, or replacement of defective parts without removing the body from the pipeline.

05

Possibility of implementing a bellows seal

Used when the highest level of gland seal tightness is required and even a small amount of operating medium leakage is unacceptable.

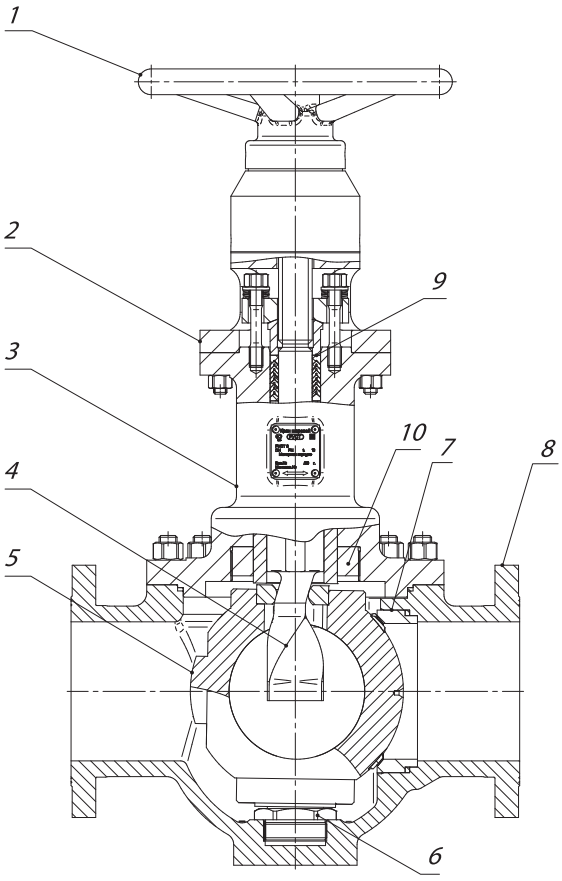
Operating principle

The valve flow part consists of the body [8], housing the seat [7], cover [2, 3], ball plug [5], stem with screw gear and trapezoidal thread [4], floating support for ball plug [10], stationary support [6], stem guide and gland seal [9], sealing rings, and sleeve.

The manual actuator comprises a rack, threaded bushing, bearings, and flywheel [1].

Closing is achieved by turning the handwheel clockwise.

The rising stem valve operates on the principle of two-stage ball plug movement, which eliminates mutual friction between the ball plug and seat, thus preventing wear on sealing surfaces. In the first stage of valve opening, the handwheel rotation, through the threaded sleeve, converts torque into translational motion of the stem, moving the ball plug away from the seat and forming an annular gap sufficient for their free relative movement. During the second stage of opening, the ball plug rotates 90 degrees. The helical surface of the stem transforms its direct motion into rotational torque on the ball plug, causing it to turn. This complex movement is achieved by implementing a kinematic pair (ball plug and stem with simultaneous rotational and translational motion) in the crane with a rising stem. Closing occurs in the reverse order.



Ball valve main seal design

Metal-to-metal seals are utilized in heavy-duty operating conditions:

- Presence of abrasive particles in the medium
- High-temperature media
- Chemically reactive media

Wear-resistant coatings, such as chromium carbide, tungsten carbide, stellite, and others, are applied to the seat and ball operating surfaces depending on the application.

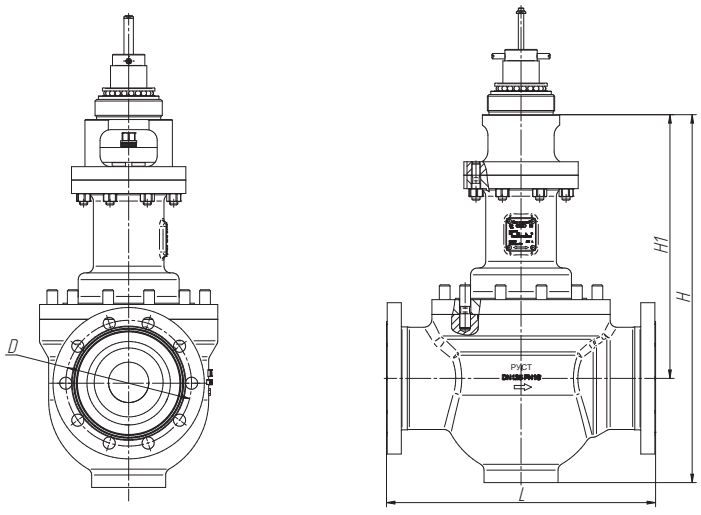
Technical parameters

Parameter	Value
Nominal diameter, DN, mm	25; 32; 40; 50; 65; 80; 100; 125; 150; 200; 250; 300; 400; 500
Nominal pressure, PN, MPa	1.6; 2.5; 4.0; 6.3; 10; 16; 25; 40
Hydraulic resistance factor, ζ not exceeding	0.2
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances
Operating medium temperature, °C	-60 to +100 standard design -60 to +350 high-temperature design -60 to +600 special high-temperature design down to -196 cryogenic design
Climatic design	N, T, F, NF, MU
Connection to pipeline	• Flanged in accordance with GOST, ANSI B16.5 • Welded
Types of actuators to be installed	• Manual • Pneumatic • Electric
Body material	Steels according to standards: ASTM A352; ASTM A351; AISI 321; AISI 316Ti; AISI 329; AISI 904L, etc. Steels according to standards: AISI 904L Alloys according to standards: ASTM A494
Materials of internal parts	Steels according to standards: AISI 420; AISI 321; AISI 316Ti; AISI 630; AISI 904L; AMS 5848; ASTM A743; ASTM A747 Alloys: Ni-based, Co-based Hard metals: Tungsten Carbide, Chromium Carbide Ceramics: Zirconia, Silicon Carbide
Design features	• Full bore • Rising stem • Antistatic device • Fire-resistant design
Special designs	• High-temperature • Cryogenic • Bellows
Seal type	Metal-to-metal
Tightness classes	A, B as per GOST 9544-2015
Flow direction	Unidirectional
Minimum response time with pneumatic actuator, s	12, for standard configuration
	1–2, optional

Weights, overall and connection dimensions
(Connection: flange)

DN, mm	PN, MPa	L*, mm	D*, mm	H, mm	H1, mm	Weight*, kg
25	1.6–25	170	115	520	451	30
32		170	135	538	457	32
40		178	145	547	460	33
50		178	160	561	465	35
65		203	180	598	490	56
80		203	195	615	498	63
100		305	215	722	593	83
125		400	225	592	642	100
150		404	280	949	781	238
200		457	335	1,241	1,040	350
250	1.6–16	674	405	1,461	1,218	630
300	1.6–10	762	460	1,720	1,444	985
400	1.6–6.3	902	580	2,028	1,680	1,633
500	1.6–4.0	991	710	2,429	2,003	2,000

* Dimensions and weights are approximate. Construction lengths follow the manufacturer's standard, but other lengths can be requested.



Symbol structure

РУСТ® X X X - X X X

1 2 3 4 5 6

1

Valve type

6: ball valve

2

Nominal pressure, MPa

1–1.6 2–2.5 3–4.0
4–6.3 5–10.0 6–16.0
7–25.0

3

Actuator type

1: pneumatic 2: electric
3: manual 4: pneumo-hydraulic

4

Operating medium temperature

1: -60 to +100 °C 2: -60 to +225 °C
3: -60 to +350 °C
4: down to -196 °C cryogenic design
5: up to +600 °C high-temperature design

5

Climatic design

N, T, F, NF, MU

6

Product placement category

1; 2; 3; 4

The symbol should be followed by a descriptive part with the following information:

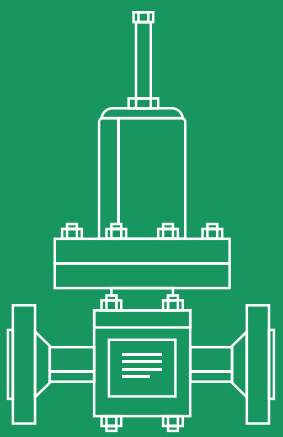
- presence of a rising stem
- nominal diameter
- operating medium
- minimum operating medium temperature (if below the climatic performance value)
- maximum operating medium temperature
- required tightness class
- body material
- special design, if applicable
- initial valve position when fitted with a pneumatic actuator
- connection to pipeline

Example of a symbol

PYCT ball valve, series 641-1 NF(1), DN80, natural gas, +100 ºC, A, alloy steel, NO, for welding

PYCT 613-1 series ball valve, MU(1) with rising stem, DN150, oil, +250 ºC, A, alloy steel, flanged

Pressure control valves



RD 100 series pressure control valve

100 series direct pressure control valves are a control device that operates using the operating medium energy without auxiliary devices (such as impulse mechanisms). The regulator is designed to maintain the specified pressure value of the operating medium in the upstream (110 series) or downstream (120 series) pipeline.

DN Nominal diameter
15 to 50 mm

PN Nominal pressure
1.6 to 4,0 MPa

T Operating medium temperature
-60 to +70 °C (+150 °C, special design)

Unique features

01

High actuation speed

Because both the sensing and actuating element is a diaphragm made of high-quality oil and gas-resistant rubber.

02

Construction compactness and simplicity

Provides reliability and ease of use.

03

Protection against exceeding the controlled pressure in the construction

Achieved by durable steel regulator body components.

Structure and operation principle of RD 110 series downstream pressure control valves

110 series downstream pressure control valves are designed for automatically maintaining the set value of the operating medium pressure in the pipeline after the control valve.

The RD 110 series pressure control valve consists of a body [1], covers [2] and [8], pressure reducing element, stem [5] with a rubber ring [24] that is installed in a guide [10], diaphragm assembly, adjustment part, guide sleeve [6] mounted in bearings [9], return spring [7], and tube [11].

The cover [2] is secured to the body [1] using studs [21] and nuts [22], or bolts [23]. The pressure reducing element comprises a seat [3] and a plate [4]. The diaphragm assembly consists of a support [12], diaphragm [13] with or without a disc [14], rigid center [15], and nut [16]. The adjustment part includes a spring [17], support [18], adjustment screw [19], and nut [20].

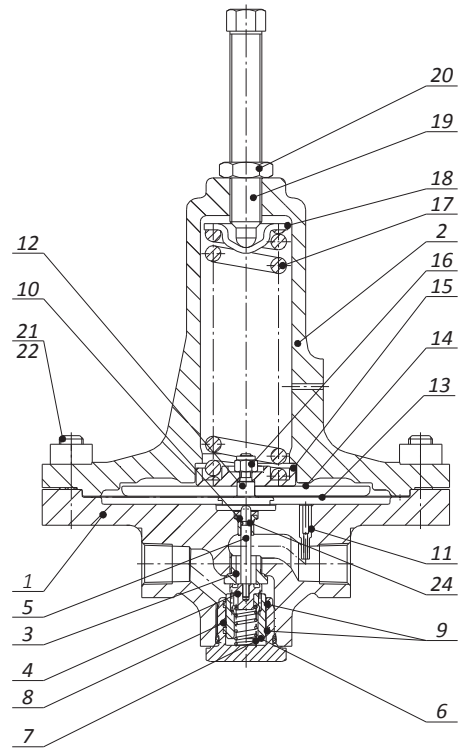
The operating principle of RD 110 series downstream pressure control valve is as follows:

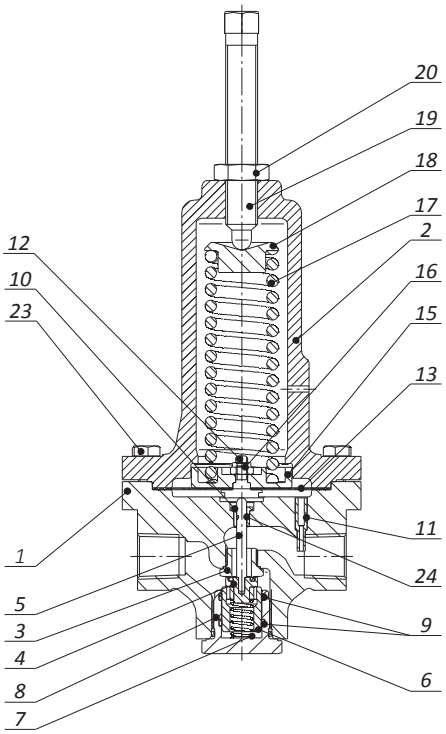
In the initial state, with the adjustment screw fully unscrewed [19], the plate [4] closes the seat [3] using the spring [7]. When tightening the adjustment screw [19], the tuning spring [17] compresses, creating a force that, through the diaphragm assembly, stem [5], plate [4], and sleeve [6], is compared to the force of the return spring [7]. When the force of spring [17] surpasses that of the return spring [7], the plate [4] descends, revealing the seat [3]. The medium with inlet pressure passes through the hole in the seat [3], reducing to a specific outlet pressure value. The medium with outlet pressure enters the cavity beneath the diaphragm [13] via the tube [11], generating a force that is compared to the spring force [17] through the diaphragm assembly.

As the outlet pressure drops below the set value, the spring [17] overcomes the forces from the outlet pressure and spring [7], causing the plate to lower further and increase the flow cross-section. The flow rate through the pressure reducing component increases until the outlet pressure equals the set value. When the outlet pressure exceeds the set value, the control valve closes.

The required control valve outlet pressure is adjusted using the adjustment screw [19]. Adjusting alters the force of the setting spring [17], consequently changing the control valve outlet pressure.

Flanges not shown





Design and operating principle of RD 120 series upstream pressure regulators

120 series upstream pressure control valves are designed for automatically maintaining a specified operating medium pressure value in the pipeline before the control valve.

RD 120 series pressure control valve comprises a body [1], covers [2] and [7], a reducing component, a stem [5] with sliding bearings [8], a diaphragm assembly, an adjustment section, and a guide sleeve [6].

The cover [2] is secured to the body [1] using studs [17] and nuts [18]. The reducing component consists of a seat [3] and a plate [4]. The diaphragm assembly is composed of a support [9], a diaphragm [10], a rigid center [11], and a nut [12]. The adjustment section includes a spring [13], a support [14], an adjusting screw [15], and a nut [16].

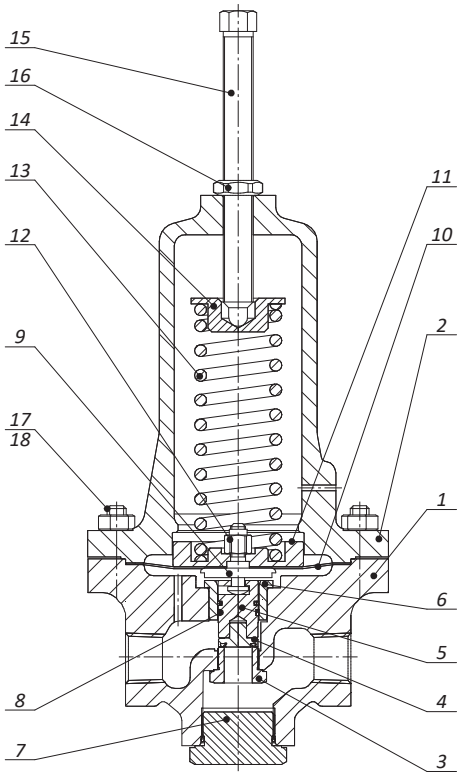
The operating principle of RD 120 series upstream pressure control valve is as follows:

During operation, the tightened adjustment screw [15] compresses the spring [13] by an amount equivalent to the inlet pressure setting. Due to the force generated by the spring compression, the plate [4] closes the seat [4] via the diaphragm assembly and the stem [5].

The medium with inlet pressure enters the cavity beneath the diaphragm [10] through an opening in the body [1], creating a force that opposes the force of the adjustment spring [13] through the diaphragm assembly.

When the force from the inlet pressure surpasses the spring force [13], the plate [4] lifts, opening the seat [3]. Excess medium is released until the inlet pressure matches the set value. If the inlet pressure is below the set value, the control valve remains closed.

The required inlet pressure for the control valve is adjusted using the adjustment screw [15]. Adjusting the force of the adjustment spring [13] changes the inlet pressure in the control valve.



Technical parameters

Key parameters of RD 110 and RD 120 pressure control valves

Parameter	Value				
Nominal diameter, DN, mm	15	20	25	40	50
Nominal flow capacity K_{vy}, m^3/h	1.6	4.0		12.0	
Nominal pressure, PN, MPa	1.6–4.0				
Operating medium	Gases and non-viscous liquids, including seawater				
Operating medium temperature, °C	• -60 to +70 standard design • -60 to +150 special design				
Emergency increase of regulated pressure, safe for control valve body	Up to PN				
Climatic design	N, T, F, NF, MU				
Material of body and cover	Steels according to standards: ASTM A352; ASTM A351				
Valve tightness	IV, V as per GOST 9544-2015				
Connection to pipeline	• Coupling type • Flanged • Connection-type				

Outlet pipeline pressure setting ranges (P_{out})

For RD 110 series downstream pressure control valves

DN, mm	PN, MPa	P_{out}, MPa	P_{out} setting range, MPa (exc.)
15; 20; 25	1.6; 2.5; 4.0	0.01–0.21	0.01–0.035
			0.03–0.1
			0.09–0.21
15; 20; 25		0.1–1.03	0.1–0.21
			0.17–0.52
			0.48–1.03
40; 50		0.03–1.03	0.03–0.1
			0.09–0.21
			0.17–0.52
			0.48–1.03

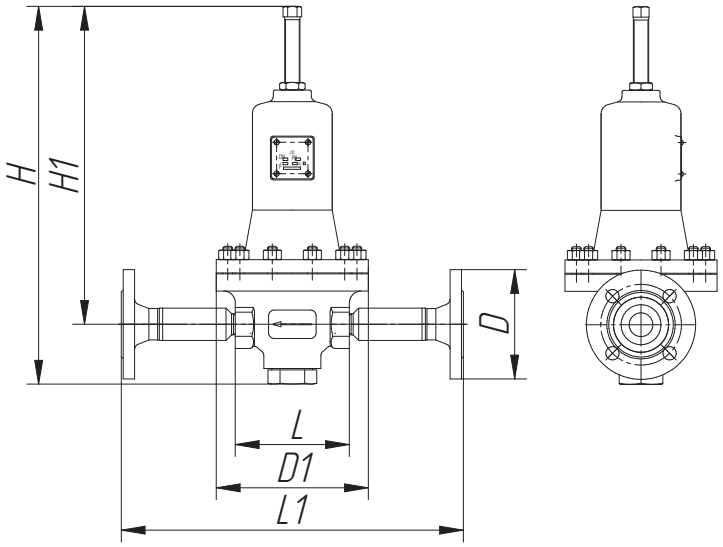
For RD 120 series upstream pressure control valves

DN, mm	PN, MPa	P_{in}, MPa	P_{in} setting range, MPa (exc.)
15; 20; 25	1.6; 2.5; 4.0	0.05–1.2	0.05–0.25
			0.2–0.7
			0.65–1.20
32; 40; 50		0.03–1.2	0.03–0.20
			0.15–0.35
			0.3–0.7
			0.65–1.20

Dimensions and connection sizes of RD 100 series pressure control valves

DN, mm	PN, MPa	P_{out} (P_{in})*, MPa	L, mm	L1, mm	D, mm	D1, mm	H, mm	H1, mm
15	1.6; 2.5; 4.0	0.01–0.21	105	280	95	205	328	280
		0.1 (0.03)–1.03 (1.2)	105	280	95	120	323	280
20		0.01–0.21	120	360	105	285	414	360
		0.1 (0.03)–1.03 (1.2)	120	360	105	160	400	345
25		0.01–0.21	120	360	115	285	414	360
		0.1 (0.03)–1.03 (1.2)	120	360	115	160	400	345
40		0.03 (0.03)–1.03 (1.2)	185	360	145	232	540	460
50		0.03 (0.03)–1.03 (1.2)	185	360	160	232	540	460

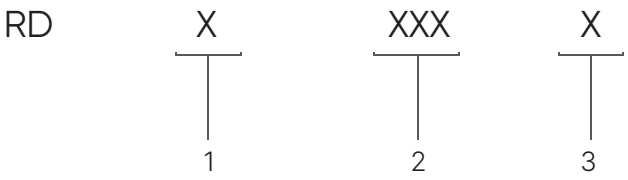
*P_{out} For downstream RD 110
P_{in} For upstream of RD 120



Weight of RD 100 series pressure control valves

DN, mm	PN, MPa	P_{out} (P_{in})*, MPa	Weight, kg	
			Coupling type	Flanged
15	1.6; 2.5; 4.0	0.01–0.21	11.3	13.0
		0.1 (0.03)–1.03 (1.2)	5.8	7.5
20		0.01–0.21	28.4	30.7
		0.1 (0.03)–1.03 (1.2)	18.4	20.7
25		0.01–0.21	28.4	31.4
		0.1 (0.03)–1.03 (1.2)	18.4	21.4
40		0.03 (0.03)–1.03 (1.2)	45.2	50.1
50		0.03 (0.03)–1.03 (1.2)	45.2	51.8

Symbol structure



1

Serial number

1: 110 series, downstream pressure control valve;
2: 120 series, upstreampressure control valve

3

Product placement category

1; 2; 3; 4

2

Climatic design

N, T, F, NF, MU

The RD designation should be followed by a descriptive section containing the following information:

- nominal diameter
- nominal pressure
- operating medium
- operating medium temperature
- setting pressure (range)
- required tightness class
- body material

Example of a symbol

NF(1) 110 RD series, DN25, PN 16 kgf/cm², operating medium: methane, -35/+55 °C, P_{out} = 0.17–0.52 MPa, tightness class IV, alloy steel

Steel 20GL GOST 21357-87 / ASTM A 352 LCC

RD 500 series pressure control valve

RD 520 series upstream and RD 510 series downstream pressure control valves are pilot-operated devices. They are intended for automatically maintaining the set pressure of the operating medium in the pipeline before or after the control valve.

DN — Nominal diameter
25 to 150 mm

PN — Nominal pressure
1.6 to 4.0 MPa

T — Operating medium temperature
-60 to +150 °C

Unique features

01

High flow capacity due to full bore construction.

02

High precision regulation is achieved through the use of pilot control.

03

The application of modern and reliable sealing materials ensures a high level of valve tightness.

04

The control valver unloaded design provides stable performance (inlet and outlet pressure fluctuations do not impact the regulation accuracy).

05

Maintainability

Possibility to perform repairs without removing the body from the pipeline.

06

Possibility to adjust low excess pressure values in the outlet pipeline after the control valve.

Operating principle

The pressure control valve consists of a body [1] with a cover [2], to which an actuator composing of the upper [3] and lower [4] covers is attached. The actuator contains a sensitive element—a diaphragm [5]— rigidly connected to the throttle plunger [7] via the stem [8]. The spring [6] is used to close and seal the trim. The required control valve outlet pressure is adjusted using the pilot screw [9].

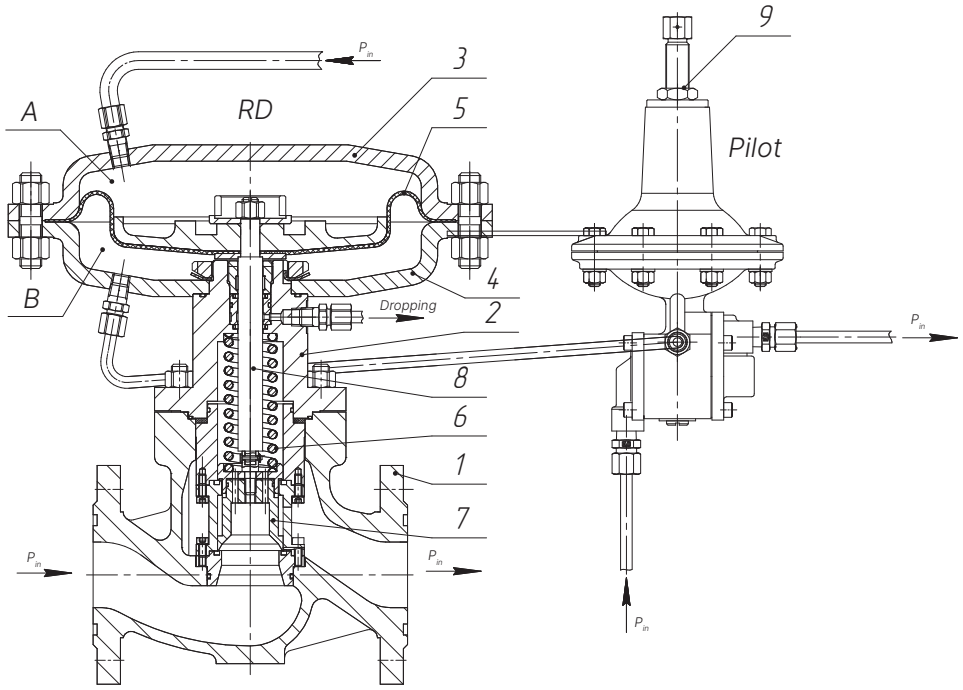
The diaphragm and actuator cover form two chambers—A and B.

Chamber A is connected to the pipeline with outlet pressure, while chamber B is connected to the pilot control pressure.

In the initial state, with no pressure in the operating pipeline and when the outlet pressure equals the set outlet pressure, the spring closes the valve.

As the medium consumption by users increases, the outlet pressure decreases. The pilot control pressure in chamber B becomes greater than the pressure in chamber A, causing the valve to slightly open and the flow through it to increase until the outlet pressure equals the outlet pressure setting. When the selection decreases, reverse operating processes take place.

Any changes in consumption lead to changes in outlet pressure, and the pilot-controlled control valve opens or closes to maintain the required flow while keeping the outlet pressure constant.



Technical parameters

Parameter		Value
Nominal diameter, DN, mm		25; 32; 40; 50; 65; 80; 100; 150; 200
Nominal pressure, PN, MPa		1.6; 2.5; 4.0
Operating medium		Non-aggressive gases
Adjustable pressure setting range	Outlet for RD 510 series, MPa	0.0005–0.3 standard design 0.15–1.5 special design
	Inlet for RD 520 series, MPa	0.05–0.25 standard design 0.65–1.2 special design
Operating medium temperature, °C		-60 to +70 standard design -60 to +150 special design
Climatic design		N, T, F, NF, MU
Minimum operating pressure differential ΔP, MPa		0.05
Pressure maintenance accuracy, %		±1
Material of body parts		Steels according to standards: ASTM A352; ASTM A351
Valve tightness		IV, V as per GOST 9544-2015
Connection to pipeline		• Flanged • Welded

Nominal flow capacity

Nominal diameter, DN, mm	25	32	40	50	65	80	100	150	200
Nominal flow capacity K_{vy}, m^3/h	10	16	25	40	63	100	160	320	500

Setting ranges for the downstream control valve outlet pressure

Outlet pressure setting ranges for RD 510 series downstreamcontrol valves are determined by the pilot type and design:

Setting ranges for RD 714 pilot*, MPa (exc.) RD 714 only for PN = 16	
RD 714–00	0.0005–0.005
RD 714–01	0.005–0.01
RD 714–02	0.0–0.025
RD 714–03	0.025–0.05
RD 714–04	0.05–0.075
RD 714–05	0.075–0.1
RD 714–06	0.1–0.3
RD 713* ranges	
RD 713–00	0.05–0.15
RD 713–01	0.15–0.5
RD 713–02	0.5–1.0
RD 715* ranges	
RD 715–00	1.0–1.5

Outlet pressure setting ranges for the upstream control valves

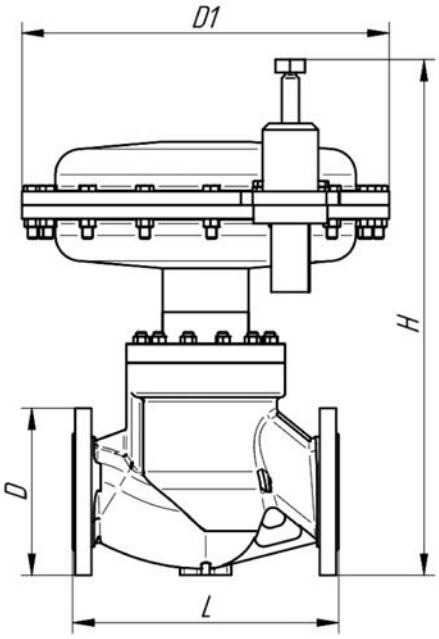
Setting ranges of outlet pressure for RD 520 series upstream control valves are determined by the pilot type and design:

Setting ranges for RD 120P pilot*, MPa (exc.)	
RD 120P–00	0.05–0.25
RD 120P–01	0.2–0.7
RD 120P–02	0.65–1.2

* For reference only

Weights, overall and connection dimensions

DN, mm	PN, MPa	L, mm	D, mm	D1, mm	H, mm	Weight, kg
25	1.6–4.0	160	115	250	291	22
32		180	135	250	300	28
40		200	145	313	354	32
50		230	160	313	344	37
65		290	180	383	379	57
80		310	195	393	387	72
100		350	215	383	540	108
150		480	280	473	688	177
200		600	355	473	717	249



Symbol structure

RD XXX XXX X

1 2 3

1

Serial number

510 series: downstream pressure control valve
520 series: upstream pressure control valve

2

Climatic design

N, T, F, NF, MU

3

Product placement category

1; 2; 3; 4

The RD designation should be followed by a descriptive section containing the following information:

- nominal diameter
- nominal pressure
- operating medium
- operating medium temperature
- setting pressure (range)
- required tightness class
- body material

Example of a symbol

NF(1) 510 RD series, DN50, PN 16 kgf/cm², operating medium: methane, -35/+55 °C, P_{out} = 0.1–0.3 MPa, tightness class IV

RD 600 series pressure control valve

RD 622 upstream and RD 612 downstream pressure control valves are devices with pilot control of direct flow type. They are designed to automatically maintain set pressure of the operating medium in the pipeline before or after the pressure control valves.

DN — Nominal diameter, DN

25 to 200 mm

PN — Nominal pressure, PN

1.6 to 10 MPa

T — Operating medium temperature

-60 to +70 °C

Unique features

01

High flow capacity value

02

Piston design

No vulnerable element—the diaphragm.

03

High regulation accuracy

Controlled by the pilot.

05

Improved trim valve flow conditions

As a result, lower noise and erosion levels.

06

Unloaded valve elements

Inlet and outlet pressure fluctuations do not affect the control valve operation.

Design and operating principle of RD 600 series pressure regulators

In RD 600 series axial control valves, the medium flow through the regulator moves axially (axial flow principle).

This type of control valves can be used to reduce the pressure of nitrogen, natural gas, and other non-aggressive gases.

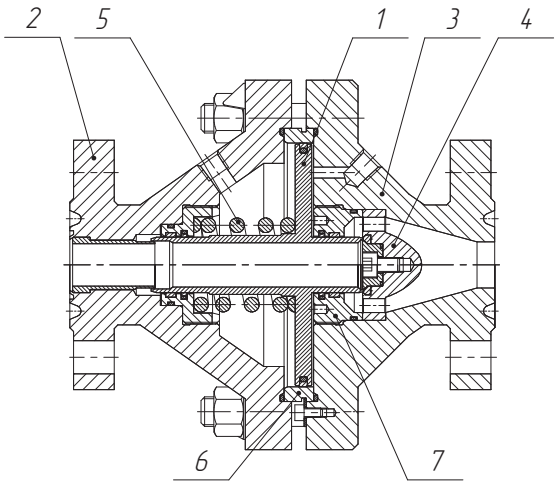
The axial pressure control valve consists of a body [2] with a cover [3]. In the cavity formed by the body and the cover, there is a plunger [1] mounted in guides [6] and [7]. The plunger simultaneously acts as a sensitive element—the piston.
A seat [4] is installed in the body. The spring [5] is used to close the valve. The required outlet pressure of the control valve is adjusted by means of the pilot screw.

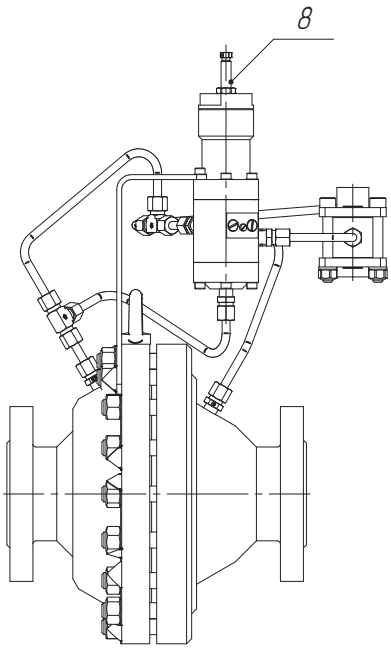
The piston separates the cavity formed by the body and cover into two parts—[A] and [B].

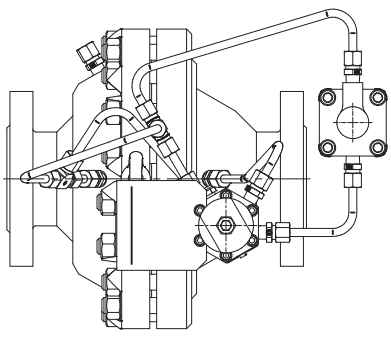
Chamber A is connected to the pipeline with outlet pressure, while chamber B is connected to the pilot control pressure.

In the initial state, with no pressure in the operating pipeline and when the outlet pressure is equal to the set outlet pressure, the spring closes the valve.

When the outlet pressure decreases, the pilot control pressure in chamber B becomes greater than the pressure in chamber A, causing the valve to slightly open and increase the flow rate until the outlet pressure equals the set outlet pressure. When the pressure increases, reverse processes take place.







Technical parameters

Parameter	Value
Nominal diameter, DN, mm	25; 40; 50; 80; 100; 150; 200
Nominal pressure, PN, MPa	1.6–10.0
Operating medium	Non-aggressive gases
Adjustable pressure setting range, MPa	0.05 to 8.0
Operating medium temperature, °C	• -60 to +70 standard design • -60 to +100 special design
Climatic design	N, T, F, NF, MU
Minimum operating differential pressure ΔP, MPa	0.1
Pressure maintenance accuracy, %	±1
Material of body parts	Steels according to standards: ASTM A352; ASTM A351; AISI 321; ASTM A738, etc.
Valve tightness	IV, V as per GOST 9544-2015
Connection to pipeline	Flanged

Nominal flow capacity

Nominal diameter, DN, mm	25	40	50	80	100	150	200
Nominal flow capacity K_{vy}, m^3/h	16	40	63	160	250	500	800

Outlet pressure adjustment ranges for RD 612 series downstream control valves (determined by pilot type and design)

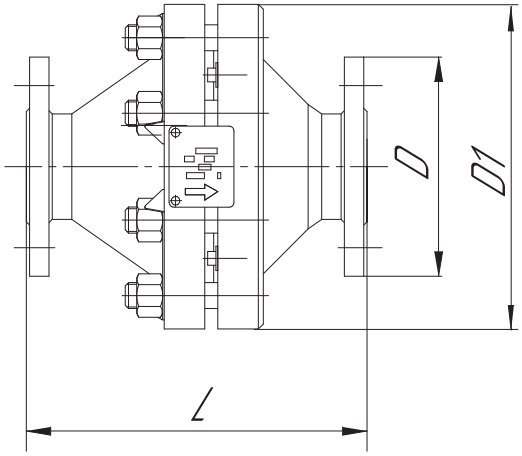
RD 713 ranges, MPa (exc.)				
RD 713-00	RD 713-01	RD 713-02		
0.05–0.15	0.15–0.5	0.5–1.0		
RD 715 ranges				
RD 715-00	RD 715-01	RD 715-02		
1.0–1.5	1.5–3.0	3.0–4.0		
RD 726 pilot ranges, MPa (exc.)				
RD 716-03	RD 716-04	RD 716-05	RD 716-06	RD 716-07
0.5–0.85	0.8–1.45	1.4–2.3	2.2–3.0	2.9–4.2
RD 727 pilot ranges, MPa (exc.)				
3.0–8.0				

Outlet pressure setting ranges for RD 622 series upstream control valves (determined by pilot type and design)

RD 726 pilot ranges, MPa (exc.)			
0.1–0.3	0.2–0.8	0.5–2.0	1.5–4.2
RD 727 pilot ranges, MPa (exc.)			
3.0–8.0			

Dimensions and connection sizes of RD 600 series pressure control valves

DN, mm	PN, MPa	D, mm	D1, mm	L, mm
25	1.6–10.0	135	200	230
40		165	300	300
50		195	300	300
80		230	410	380
100		265	450	430
150		350	570	550
200		430	690	650



Symbol structure

RD X - XXX X

1 2 3

1

Serial number

5: 612 series, downstream pressure control valve
6: 622 series, upstream pressure control valve

3

Product placement category

1; 2; 3; 4

2

Climatic design

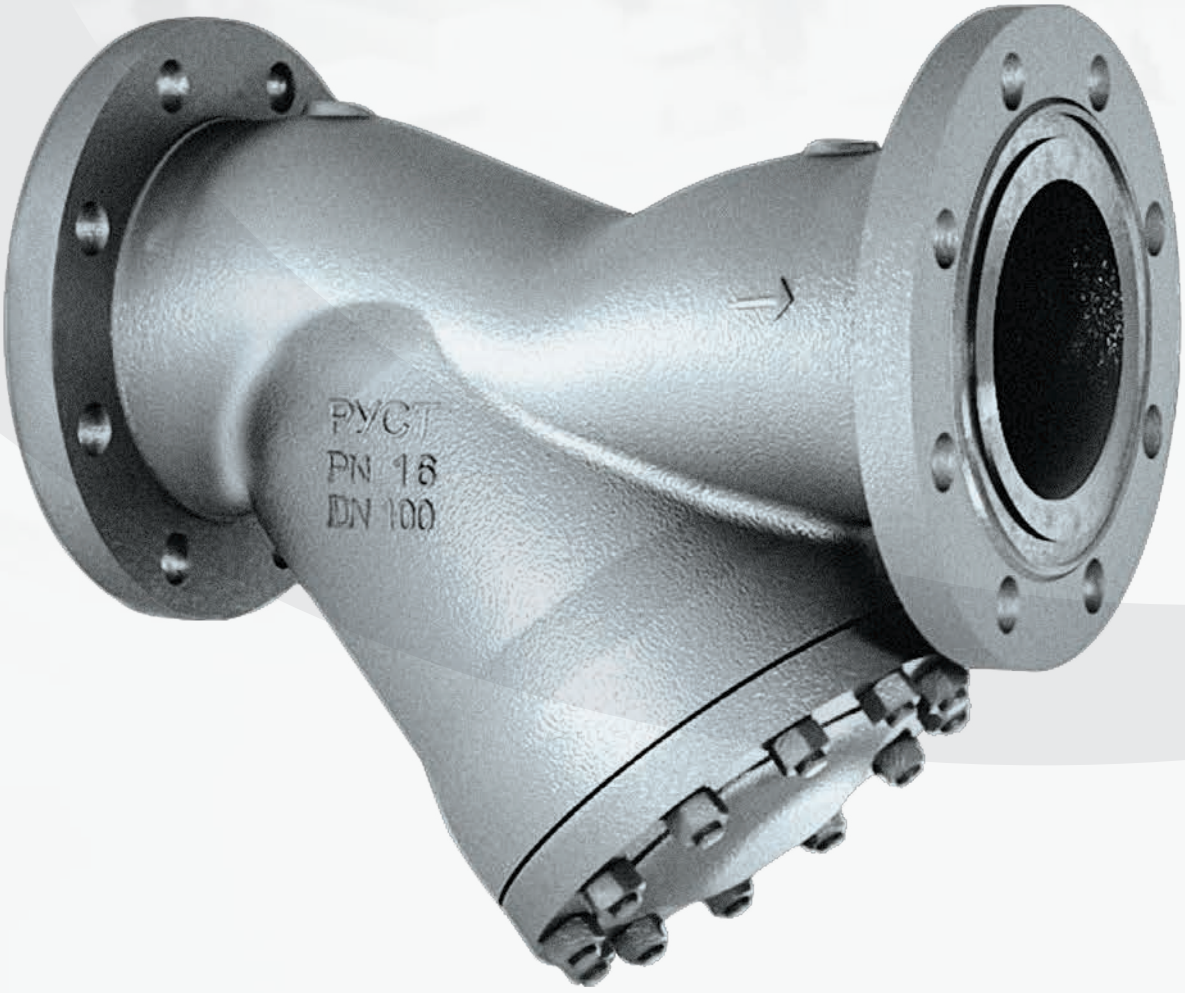
N, NF, MU, T

The RD designation should be followed by a descriptive section containing the following information:

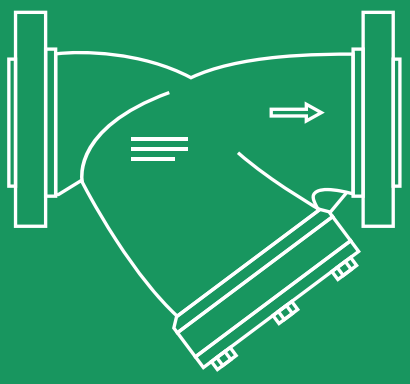
- nominal diameter
- nominal pressure
- operating medium
- operating medium temperature
- setting pressure (range)
- required tightness class
- body material

Example of a symbol

RD series 612 NF(1), DN100, PN 100 kgf/cm², operating medium: methane, -35/+55 ˚C, P_{out}= 0.5–2.0 MPa, tightness class IV, alloy steel



Strainers



FS series Y-shaped type strainer

FS series Y-shaped type strainers are designed to purify liquid and gaseous media flows from mechanical particles.

DN Nominal diameter
25 to 300 mm

PN Nominal pressure
1.6 to 16 MPa

T Operating medium temperature
-196 to +500 °C

Unique features

01

Possibility of direct connection between the filter and the equipment protected by the product

A non-symmetrical design of the filter body flanges is possible, allowing for direct installation upstream of the product to be protected from contamination, without any additional adapters.

02

Increased allowable pressure drop across the filter

The filter element design includes a sturdy shell, perforated with holes, inside which the strainer mesh is installed. This shell reduces the negative impact of loads (especially high in case of clogged mesh) associated with the flow effect on the filter element.

03

Wide range of filtration sizes

The cells of the strainer mesh can vary in size. Filter media can be made from non-woven materials, such as fluoroplastic, polypropylene, and others.

04

Possibility of magnetic elements installation

The filter design allows for the installation of magnets to capture metallic particles, enhancing its filtration capability.

05

Pressure gauge connection

Holes can be made for connecting pressure gauges to measure the pressure difference across the filter and evaluate its level of contamination.

06

Fast filter cleaning feature

A drainage hole can be made in the cover, allowing accumulated impurities to be discharged without removing the cover from the filter body.

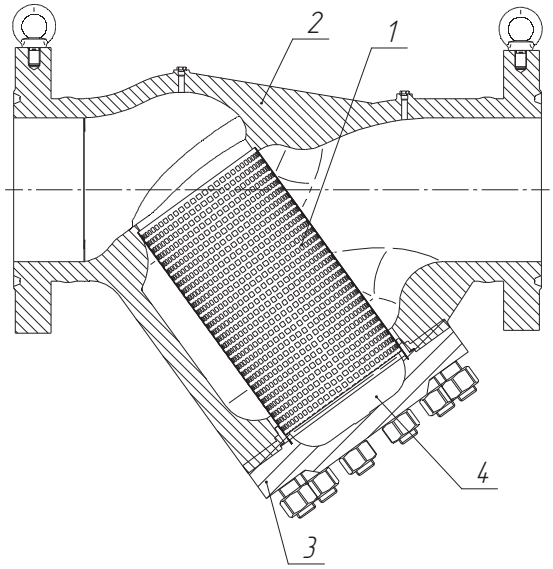
Operating principle

FS series Y-shaped type strainers consist of a cast body, flanged or with welding ends, a filter element, and a cover secured to the body using studs.

The filtering element [1] installed in the body [2] and secured with the cover [3] is designed as a two-layer hollow cylinder. The outer layer is a corrosion-resistant steel shell perforated with large holes, while the inner layer is a fine-mesh woven screen made of corrosion-resistant wire.

As the flow passes through the filter element, it changes direction, causing larger dirt particles to enter the cavity [4] of the cover due to inertial forces. Finer particles are not allowed through the mesh of the strainer element. Accumulated dirt is removed by taking off the cover and filtering element from the body. To ensure contaminants are securely held in the cover cavity, the filter is installed with the cover facing downward.

Flanges are made on the filter body, in which threaded holes can be created for connecting devices that measure pressure.



Nominal flow capacity

Nominal diameter, DN, mm		25	50	80	100	150	200	250	300
Nominal pressure, PN, MPa		1.6; 2.5; 4.0; 6.3; 10; 16							
Nominal flow capacity K_{vy}, m^3/h, for mesh size, mm	Standard mesh (5.0–0.25 mm)	16	63	160	250	570	1,000	1,500	2,200
	Fine mesh (0.2–0.04 mm)	15	61	140	215	410	750	1,100	1,700
Maximum allowable pressure drop across the filter, kgf/cm^2		12	10	8.0	6.0			4.0	2.5

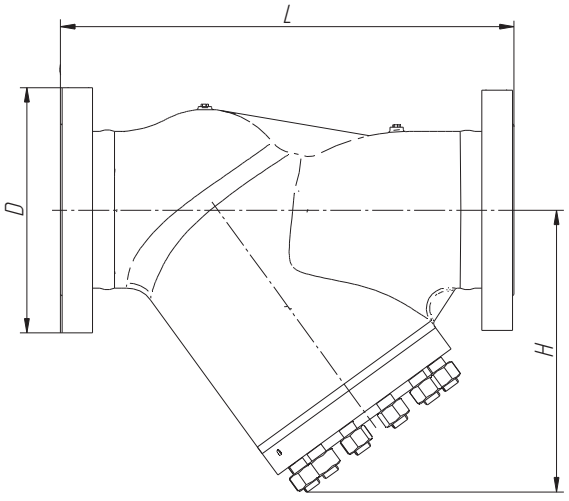
Technical parameters

Parameter	Value
Nominal diameter, DN, mm	25; 50; 80; 100; 150; 200; 250; 300
Nominal pressure, PN, MPa	1.6; 2.5; 4.0; 6.3; 10; 16
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances, excluding particularly viscous and crystallizing media
Operating medium temperature, °C	-196 to +500 standard design
Climatic design	N, T, F, NF, MU
Connection to pipeline	• Flanged according to GOST, ANSI B16.5, including asymmetrical designs • Welded
Body material	Steels according to standards: ASTM A352; ASTM A351; ASTM A217 Alloys according to standards: ASTM A494
Filtering element material	Steels according to standards: AISI 321; AISI 316Ti Alloys: Ni-based Steels according to standards: AISI 321

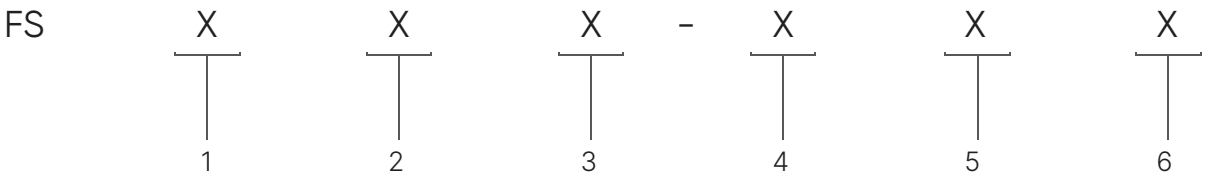
Nominal diameter DN, mm	Threaded hole size in the cover
25; 50	K1/2"
80; 100	K1/2"
150; 200	K1"
250; 300	K1½"

Weights, overall and connection dimensions

DN, mm	PN, MPa	L, mm	D, mm	H, mm	Weight, kg
25	1.6; 2.5; 4.0	160	115	98	4
	6.3	230	135	96	7
	10.0; 16.0		135	133	8.5
50	1.6; 2.5; 4.0	230	160	150	30
	6.3	300	175	170	16
	10.0; 16.0		195	184	25
80	1.6; 2.5; 4.0	310	195	210	18
	6.3	380	210	223	23
	10.0; 16.0		230	264	36
100	1.6; 2.5; 4.0	350	230	267	30
	6.3	430	250	258	42
	10.0; 16.0		265	292	65
150	1.6; 2.5; 4.0	480	300	314	60
	6.3	550	340	323	86
	10.0; 16.0		350	365	130
200	1.6; 2.5; 4.0	600	375	415	130
	6.3	650	405	431	160
	10.0; 16.0		430	456	-
250	1.6	730	405	310	312
300	1.6	850	460	615	335.5
	2.5		485		356
	4.0	980	510		403
	6.3–16.0	1,100	530, 585	685	850



Symbol structure



FS filter type

1 Nominal diameter DN, mm 25; 50; 80; 100; 150; 200; 250; 300	4 Size of cells in the net, mm 0.04; 0.05; 0.06; 0.08; 0.1; 0.2; 0.4; 0.5; 0.6; 0.8; 1.0; 1.2; 1.6; 2.0; 2.5
2 Body material CS: carbon steel SS: stainless steel CRLAS: cold-resistant low-alloy steel MCSS: molybdenum-containing stainless steel OG: other grade	5 Climatic design N, T, F, NF, MU
3 Nominal pressure PN, MPa 1.6; 2.5; 4.0; 6.3; 10.0; 16.0	6 Placement category 1; 2; 3; 4

Example of a symbol

Description	Strainer, FS 80 S 4.0–0.8 U, Y-type

FS SERIES CONE-TYPE STRAINER

FS series cone-type strainers are designed for cleaning liquid and gaseous media flows from mechanical particles.

DN Nominal diameter
200 to 500 mm

PN Nominal pressure
1.6 to 16.0 MPa

T Operating medium temperature
-196 to +500 °C

Unique features

01

Possibility to directly connect the filter and the protected product

Asymmetric flange design of the filter body is possible, allowing it to be installed directly upstream of the product being protected from contamination without any additional adapters.

02

Increased allowable pressure drop across the filter

The strainer element design features a sturdy shell perforated with holes, within which a filtering mesh is installed.
This shell helps reduce the negative effects of loads (particularly high in cases of severe mesh clogging) related to the flow impact on the filter element.

03

Decreased weight and size characteristics

Due to the axial design, conical filters are small in size and weight. Essentially, the filter weight is comparable to that of a flanged coil of equal length.

04

Wide range of filtration sizes

The cells of the filtering mesh can vary in size. Filtering materials can include non-woven fabrics made from fluoroplastics, polypropylene, and more.

05

Possibility to use the filter as a flanged coil

The conical type filter design allows for its conversion into a flanged coil of the same installation length by simply removing the filter element from the body when filtration is not required.

Operating principle

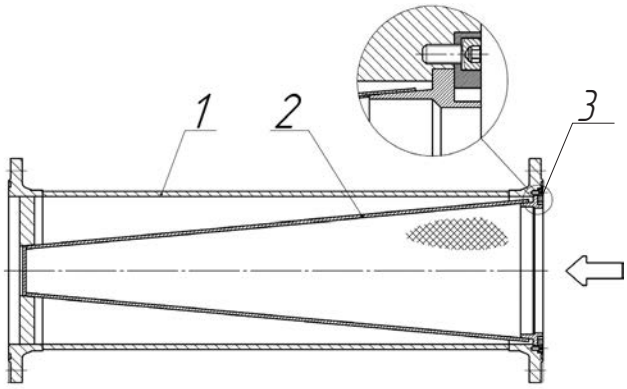
FS series cone-type strainers consist of a welded axial type flanged body.

The body [1] is composed of a pipe blank, two flanges, and a filter element support.

The filter element [2] is designed as a two-layer hollow truncated cone with the base at the smaller diameter. The filter element outer layer is a large-hole perforated shell made of corrosion-resistant steel, while the inner layer is a fine-mesh woven screen made of corrosion-resistant wire.

The filter element is secured in the body using the screws [3], clamping its larger diameter to one edge of the body. The smaller diameter rests on a support on the opposite side of the body.

When the flow passes through the filter, contaminant particles are captured by the filter element mesh. Accumulated dirt is removed when the filter is detached from the pipeline.



Technical parameters

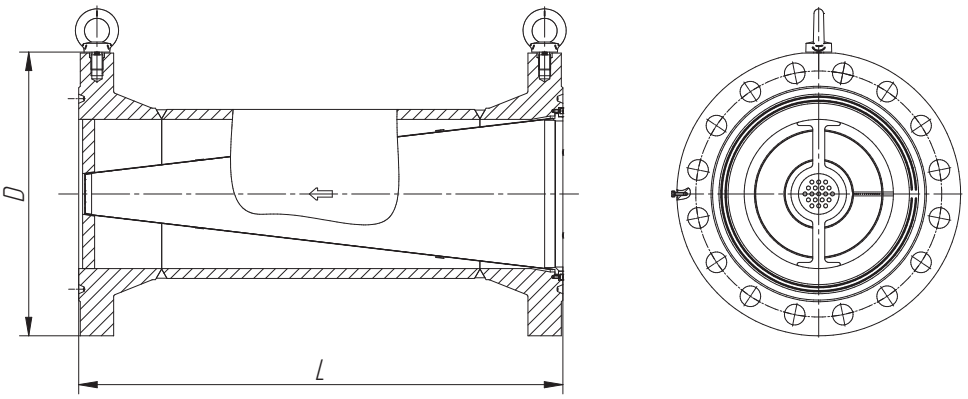
Parameter	Value
Nominal diameter, DN, mm	200; 250; 300; 350; 400; 500
Nominal pressure, PN, MPa	1.6; 2.5; 4.0; 6.3; 10.0; 16.0
Operating media	Gaseous and liquid products, including aggressive and solid-containing substances, excluding particularly viscous and crystallizing media
Operating medium temperature, °C	-196 to +500, depending on the body material
Climatic design	N, T, F, NF, MU
Connection to pipeline	Flanged according to GOST, ANSI B16.5, including asymmetrical designs
Body material	Steels according to standards: AISI 1020; ASTM A 738; AISI 321; AISI 316Ti
Filtering element material	Steels according to standards: AISI 321; AISI 316Ti Steels according to standards: AISI 321

Nominal flow capacity

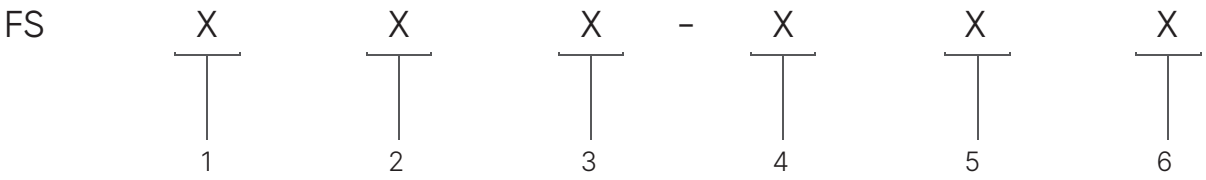
Nominal diameter, DN, mm	200	250	300	350	400	500
Nominal pressure, PN, MPa	1.6; 4.0; 6.3; 10.0; 16.0					
Nominal flow capacity K_{vy}, m^3/h, for mesh 0.2–5.0 mm	1,050	1,650	2,400	2,400	4,250	6,750
Maximum allowable pressure drop across the filter, kgf/cm^2	3.0	2.5		2.0		1.5

Weights, overall and connection dimensions

DN, mm	PN, mm	L, mm	D, mm	Weight, kg
200	10.0; 16.0	738	430	145; 152
250	6.3; 10.0; 16.0	852	470; 500; 500	180; 238; 250
300	1.6; 2.5; 4.0; 6.3; 10.0; 16.0	1,100	460; 485; 510; 530; 585; 585;	136; 156; 189; 239; 239; 355; 416
350	1.6; 2.5; 4.0; 6.3; 10.0	1,175	520; 550; 570; 595; 655	162; 212; 250; 331; 500
400	1.6; 2.5; 4.0; 6.3; 10.0	1,220	580; 310; 655; 670; 715	227; 267; 341; 422; 614
500	1.6; 2.5; 4.0; 6.3	1,250	710; 730; 755; 800	346; 379; 449; 684



Symbol structure



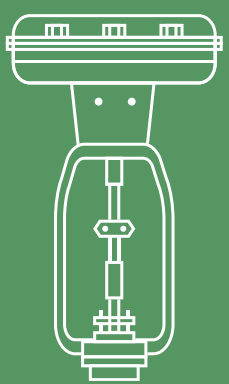
FS filter type

1 Nominal diameter DN, mm 200; 250; 300; 350; 400; 450	4 Size of cells in the net, mm 0.04; 0.05; 0.06; 0.08; 0.1; 0.2; 0.4; 0.5; 0.6; 0.8; 1.0; 1.2; 1.6; 2.0; 2.5
2 Body material CS: carbon steel SS: stainless steel CRLAS: cold-resistant low-alloy steel MCSS: molybdenum-containing stainless steel OG: other grade	5 Climatic design N, T, F, NF, MU
3 Nominal pressure PN, MPa 1.6; 2.5; 4.0; 6.3; 10.0; 16.0	6 Placement category 1; 2; 3; 4

Example of a symbol

Strainer, FS 80 S 4.0–0.8 U, cone-type

Actuating mechanisms



Pneumatic diaphragm-spring actuator (PM)

The direct diaphragm-spring actuator (PM) transforms a standard pneumatic inlet signal of 0.02–0.1 MPa into a direct movement of the outlet shaft connected to the valve stem, enhancing speed and accuracy from the ACS electrical signals and organizing feedback signals. It can be equipped with instrumentation and automation devices.

Diaphragm operating area

250; 400; 630; 1,000 cm^2

Actuator stem stroke

16; 25; 40; 60 mm

Unique features

01

Adjustable initial clamping force

02

Possibility to replace or install springs for working with required pneumatic control signal pressure ranges

03

Operates at ambient temperatures down to -60 °C

04

Possibility to work with natural gas as a pulse power source

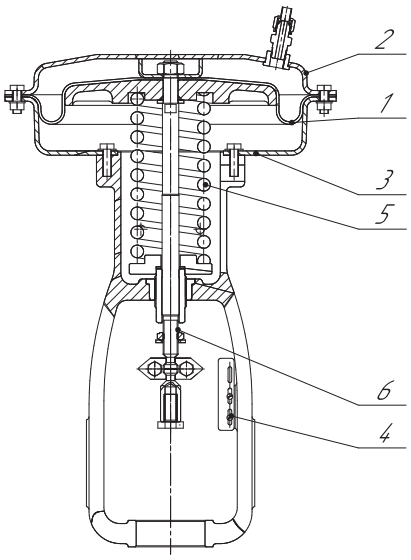
05

Instrumentation wiring is made of stainless steel tubing

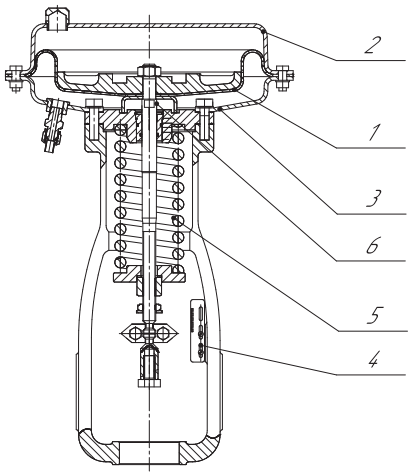
Operating principle

In PM, the control air pressure acts on the diaphragm [1], clamped around the perimeter between the covers [2] and [3], and generates a force that is balanced by the spring [5] located in the actuator body [4]. As a result, the actuator stem stroke [6] is proportional to the control pressure magnitude. The stiffness and pre-compression of the spring determine the actuator force range and nominal stroke.

If, in the absence of a pneumatic signal, the spring pushes the actuator stem stroke to the extreme lower position, the actuator is normally closed (NC). If, without a pneumatic signal, the spring pulls the actuator stem to the extreme upper position, the actuator is normally open (NO).



Normally open actuator



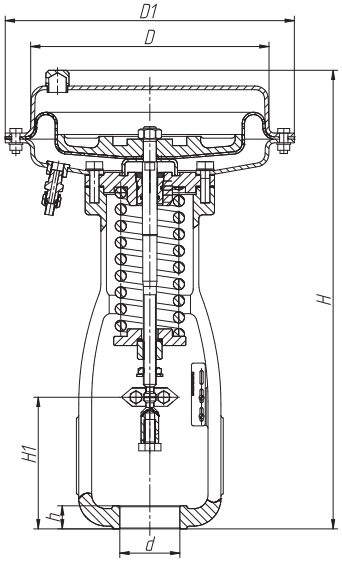
Normally closed actuator

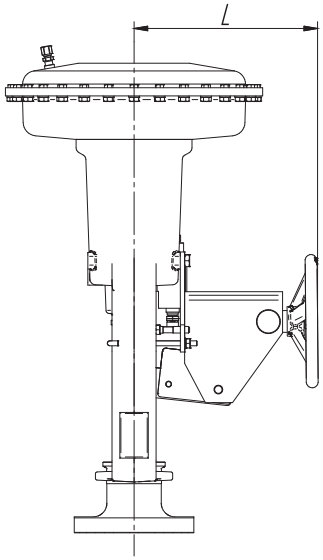
Technical parameters

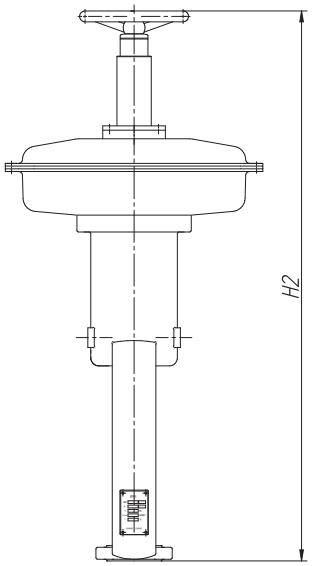
Actuator type		PM 250		PM 400		PM 630		PM 1000	
Effective diaphragm area, cm^2		250		400		630		1,000	
Pneumatic connection		NPT 1/4, GE08LR 1/8 A3K (Parker)							
Inlet pneumatic signal, MPa	Nominal	0.02 to 0.135							
	Maximum	0.25 (2.5)		0.4 (4)		0.25 (2.5)			
Actuator stem stroke, mm		16		25		40		60	
Action type		NO	NC	NO	NC	NO	NC	NO	NC
Maximum force on the handwheel required for rotation, N×m		12		16		25		32	
Climatic design		N, T, F, NF, MU							

Connecting dimensions

Actuator type / Action type		D, mm	D1, mm	d, mm	H, mm	h, mm	H1, mm	H2, mm	L, mm
PM 250	NO	200	250	65	365	25	135	555	277
	NC				385		120	575	
PM 400	NO	250	310	65	475	25	170	680	277
	NC				505		145	720	
PM 630	NO	320	380	85	595	28	205	820	357
	NC				630		165	870	
PM 1000	NO	400	470	85	780	28	250	1,040	357
	NC				810		190	1,080	







Symbol structure

РУСТ® PM X X X

1 2 3 4

1

Product name

PM: diaphragm-spring actuator

2

Effective diaphragm area, cm^2

250; 400; 630; 1,000

3

Action type

NO: normally open
NC: normally closed

4

Climatic design

N, T, F, NF, MU

5

Placement category

1; 2; 3; 4

Example of a symbol

РУСТ PM 250 NO NF 1

Pneumatic piston actuator (PP)

The direct piston actuator (PP) converts the inlet pneumatic signal into a translational movement of the outlet shaft. Actuator can be equipped with a quarter-turn reducer for operation on rotary valves. To enhance speed and accuracy from electrical signals of the ACS and to organize feedback signals, it is equipped with necessary instrumentation and automation devices.

Diaphragm operating area

132; 1250; 2,000; 2,800 cm^2

Actuator stem stroke

12; 100; 125; 160 mm

Unique features

01

Possibility to replace or install additional springs for operation with required pneumatic control inlet signal pressure levels.

02

Large repositioning forces and actuator rigidity.

03

Applicable with direct and rotary valves.

04

One-way and two-way operation modes.

05

Possibility to operate with natural gas as a pulse power source.

06

Instrumentation piping made of stainless steel.

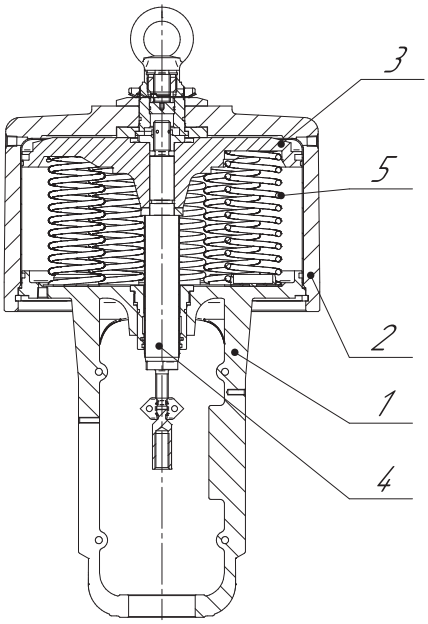
07

Operates at ambient temperatures down to -60 °C.

Operating principle

In the pneumatic piston actuator, the control air pressure acts on the piston [3], located in the cylinder [2], and generates a force that is balanced by springs [5]. As a result, the actuator stem stroke [4] is proportional to the control pressure magnitude. The spring stiffness and pre-compression determine the actuator force range and nominal stroke.

If the spring extends the actuator stem to its lowest position in the absence of a pneumatic signal, the actuator is considered normally closed. If the actuator is in the topmost position, it is considered normally open. The pneumatic actuator can be assembled as either NC or NO using the same set of parts.

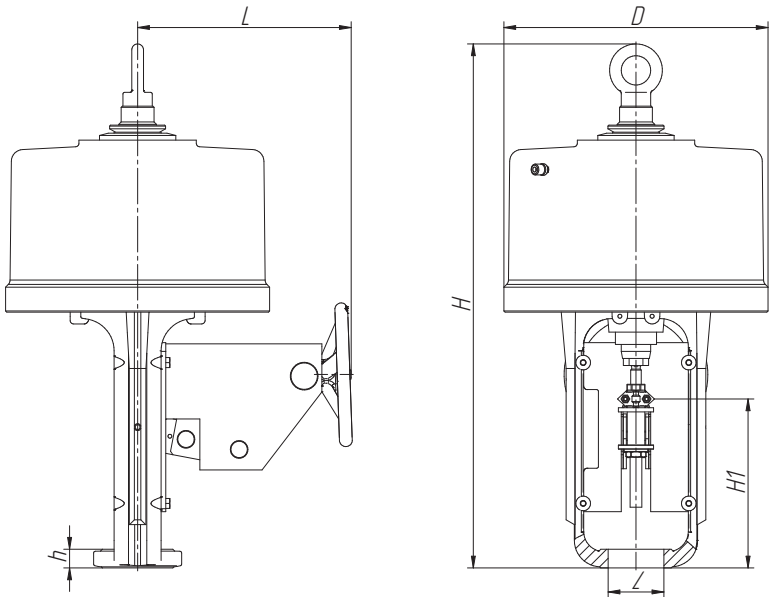


Technical parameters

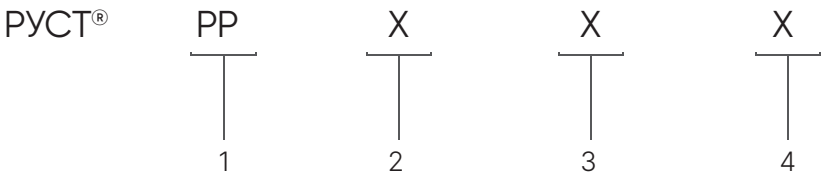
Actuator type		132		1,250		2,000		2,800	
Actuator stem stroke, mm		12		100		125		160	
Pneumatic connection		NPT 1/4, GE08LR 1/8 A3K (Parker)							
Actuator type		NO	NC	NO	NC	NO	NC	NO	NC
Inlet pneumatic signal, MPa	nominal	0.08 to 0.25		0.02 to 0.1		0.06 to 0.2		0.18 to 0.58	
	maximum	1		0.6		0.6		0.6	
Repositioning forces, kgf	At the start of the stroke	413	39	2,697	7,093	3,688	10,557	7,693	11,920
	At the end of the stroke	186	165	1,588	5,984	1,109	7,978	1,353	5,580
Spring transposition forces, kgf	Pre-compressed	114	133	443		1,218		5,000	
	During compression on the operating stroke	342	368	1,552		3,797		11,335	
Maximum force on the handwheel for rotation, N×m		20		48				35	
Climatic design in accordance with GOST 15150		N, T, F, NF, MU							

Connecting dimensions

Actuator type / Action type		D, mm	d, mm	H, mm	h, mm	H1, mm	L, mm
132	NO	150	45	237	15	-	-
	NC						
1,250	NO	450	95	893	32	287	370
	NC					187	
2,000	NO	550	95; 115	1,011	32	312	368
	NC					187	
2,800	NO	715	115	1,750	40	483	-
	NC			1,725		316	



Symbol structure



1

Product name

PP: piston actuator

2

Effective diaphragm area, cm^2

132; 1,250; 2,000; 2,800

3

Action type

NO: normally open
NC: normally closed

4

Climatic design

N, T, F, NF, MU

5

Placement category

1; 2; 3; 4

Example of a symbol

PP 1250 NO NF 1

PR manual actuator

Use

PR series manual actuator is intended for moving the trim of multipurpose pipeline valves.

Actuator stem stroke

10; 16; 25; 40; 60; 100; 125 mm

Unique features

01

Can be used as a linear motion mechanism for electric actuators.

02

No maintenance required for the actuator.

03

Significant repositioning force.

04

Operates at ambient temperatures down to -60 °C.

Operating principle

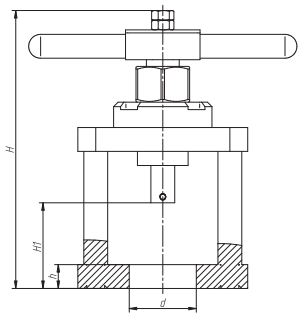
The actuator functions based on the screw/nut movement conversion principle. The nut performs only rotational motion, while the screw performs linear motion. Stroke nut fixation is provided in intermediate positions within the stroke range.

Technical parameters

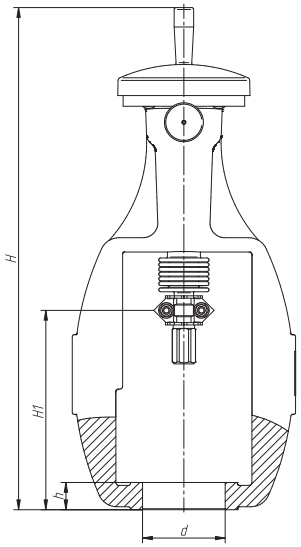
Actuator type	PR 10	PR 16			PR 25		PR 40	PR 60	PR 100	PR 125
Actuator stem stroke, mm	10	5	10	16	16	25	40	60	100	125
Maximum torque required for rotation, N×m	12	25					31.5		45	
Climatic design in accordance with GOST 15150	N, T, F, NF, MU									

Weight and connection dimensions

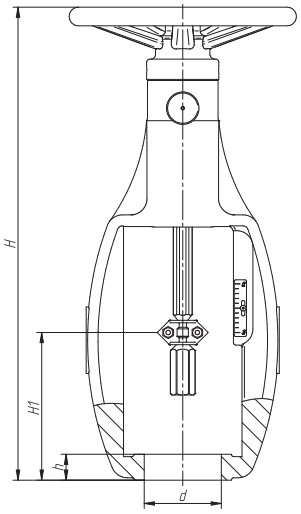
Actuator type/ actuator stem stroke, N×m		Weight, kg	H, mm	H1, mm	D, mm	h, mm
PR-10	10	3	185.5	58	45	16
PR-25	16	5.1	353	108	65	25
	25					
PRM-80	40	6.1	410	93	85	28
PRM-100	60	7.4	518.5	225	85	28
PRM-250	100	24.5	583	182	95	32
PRM-400	125	50	832	179	115	32



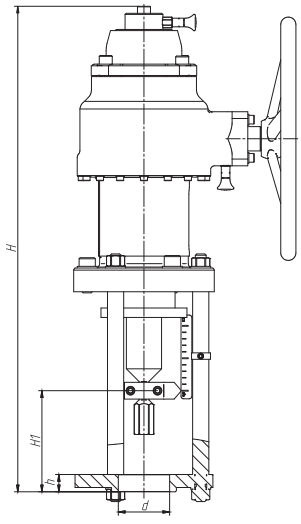
PR 10



PR-16/PR-60



PR-100



PR-125

Symbol structure

РУСТ® PR X X X

1 2 3 4

1	3
Product name PR: manual actuator	Climatic design N, T, F, NF, MU
2	4
Actuator stem stroke, mm 10; 16; 25; 40; 60; 100; 125	Product placement category 1; 2; 3; 4

Example of a symbol

РУСТ PR 25 NF 1

VEMP 200 electromagnetic actuator

VEMP explosion-proof electromagnetic actuator is installed on straight-through type shut-off valves. Used for remote control systems from central panels, interlocks, and emergency shutdown requiring short actuation times.

Use

Conversion of a binary electrical signal into shut-off valve trim movements.

Traction force

400 N

Actuator stem stroke

22 mm

Unique features

01

Repositioning time less than 1 second.

02

Low energy consumption in holding mode.

03

Compatible with sealless gland.

04

Operates from a discrete signal or power supply.

05

Integrated control unit, external option available.

06

Explosion protection type: "flameproof enclosure" with 1ExdIIC T6Gb marking.

07

Operates at ambient temperatures down to -60 °C.

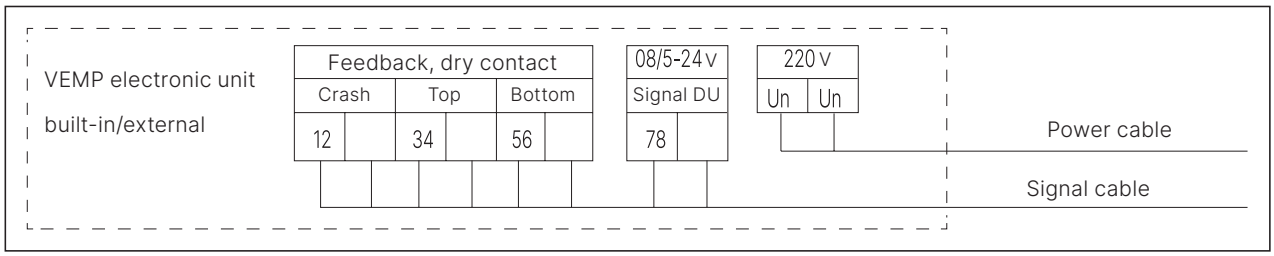
Operating principle

Upon receiving an electrical control signal (or 220 V power supply), the VEMP electronic unit generates a 220 V starting voltage for the actuator coil.
The actuator anchor is pulled in, compressing the return spring. After checking the armature position against the control signal for 2 seconds, the starting voltage switches to a 15 V holding voltage. Upon removal of the control signal (or 220 V power supply), the actuator coil is de-energized, and the armature returns to its original position with the help of a return spring.

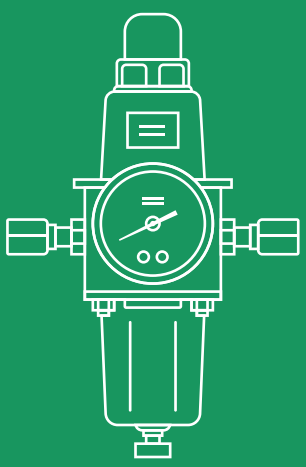
Technical parameters

Actuator stem stroke, mm	22
Action type	NC
Explosion protection type	1ExdIIC T6Gb
Dust and moisture protection level	IP65
Climatic design in accordance with GOST 15150	N, F, NF
Control signal, V	0–24
Feedback signal	3×dry contact
Supply voltage, V	220
Power consumption Start/Hold, W	600/15
Cable connection	2×M20×1.5
Overall dimensions, mm (L x W x H)	250 × 140 × 216
Weight, kg	16

VEMP 200 actuator wiring diagram



Automatic control instruments



EPK 300 explosion-proof electropneumatic valve

The electropneumatic valve (EPK) is a modular series of valves consisting of a basic direct-acting electromagnetic valve and a set of pneumatic units for pilot control, interlocks, and air preparation.

Use

Converting binary electrical signal into pneumatic signal to control pneumatic actuators of spring-return and double-acting cutoff and control pipeline valves in hazardous areas: used for remote control systems from central control panels, interlocks, emergency shutdown, etc.

Unique features

01

The modular design ensures a tubeless connection of pneumatic elements and allows EPK 300 to be combined/ adapted for vario us pneumatic actuator control tasks.

02

Explosion protection of the "flameproof enclosure" type with the marking 1ExdIIC T6 Gb.

03

A wide range of solenoids and an integrated rectifier allow the EPK to be compatible with all power supply standards.

04

Compact assembly size and simple installation.

05

Operates at ambient temperatures down to -60 °C.

06

The basic design manual double-actuator enables forced air supply/release to/from the actuator when power is unavailable (PW, emergency, etc.).

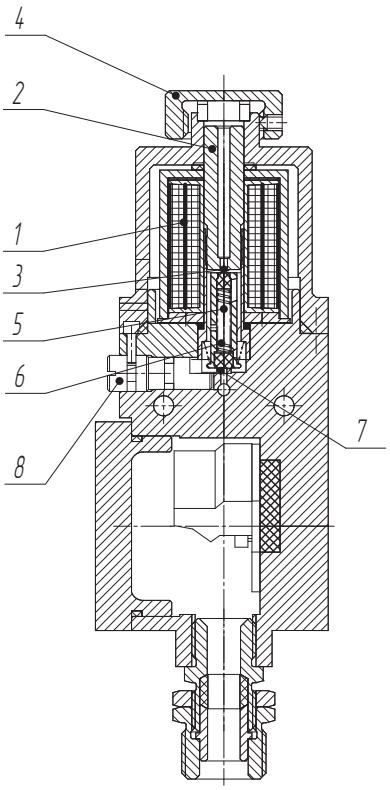
07

Possibility to use purified and dehydrated natural gas as impulse gas.

Operating principle

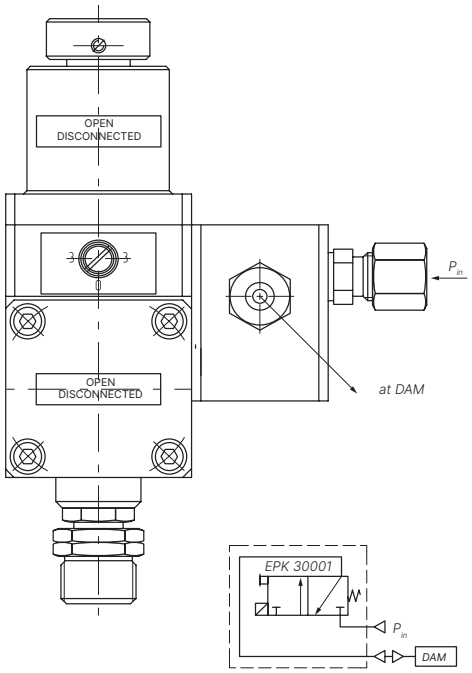
EPK 300.01 is a three-port (3/2) direct-acting, normally closed electromagnetic valve. It serves as the fundamental component of EPK 300 series valves. To address pneumatic actuators control tasks, EPK is outfitted with suitable pneumatic units.

EPK 300.01 comprises an electromagnetic coil [1], mounted on a separator tube [2]. The separator tube features a seat [3] and a bore for air release into the atmosphere. A movable core [5] with rubber valves at the ends is located inside the tube. The spring [6] pushes the core against the seat [7], closing the inlet channel, while the seat [3] remains open and the outlet channel communicates with the atmosphere. The manual double actuator [8] ensures valve activation in the absence of an electrical signal. The body is marked with "0" and "Z," representing the open and closed positions of the inlet channel. When an electrical signal is applied to the electromagnetic coil [1], the core [5] is attracted to the saddle [3] of the separating tube [2], taking the extreme upper position. The seat [7] opens, connecting the inlet and outlet channels, while the seat [3] closes, breaking the connection between the outlet channel and the atmosphere.



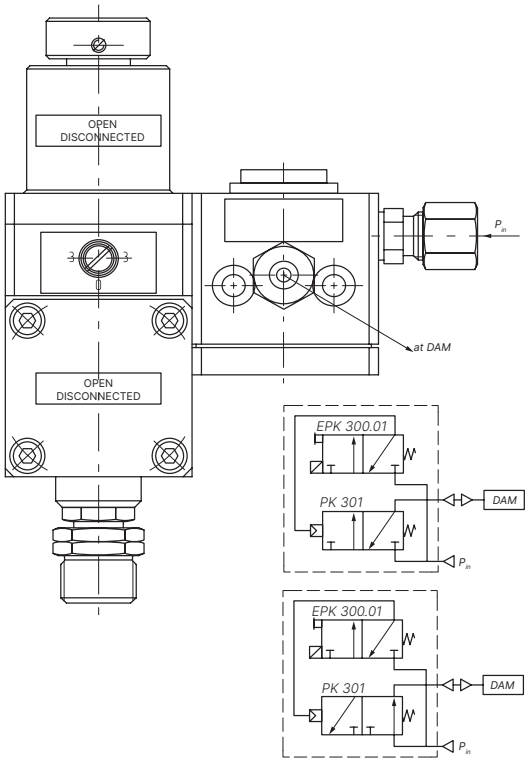
EPK 300.100 unit: controlling an actuator with a volume of less than 1 liter

EPK 300.100 comprises EPK 300.01 module and AB 100 adapter board. EPK 300.01 is an electropneumatic valve with direct electromagnetic control, three-port two-position (3/2), normally closed with a manual override. AB 100 adapter board is a monoblock with two G1/8 connector inputs and four holes for connecting to the EPK 300.01 and the pneumatic actuator mounting bracket. One of the connector inputs allows for the connection of RDF 300 pressure reducer with filter.



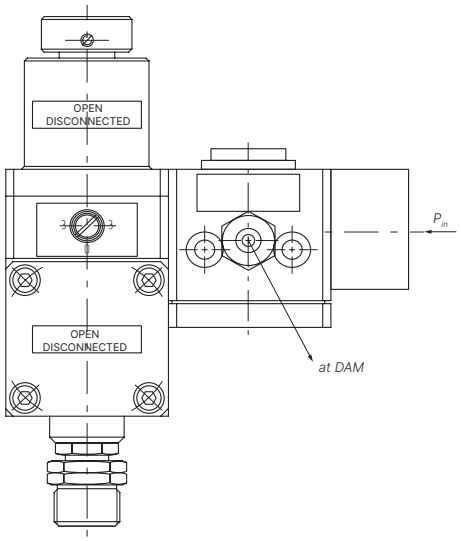
EPK 300.300, EPK 300.301 units controlling NC/NO actuators with a volume of more than 5 liters

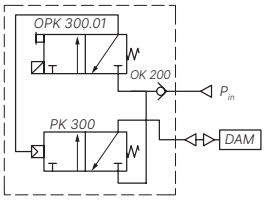
EPK 300.300, EPK 300.301 are composed of EPK 300.01 and PK300 (NC) or PK 301 (NO). The connection to EPK 300.01 and the valve mounting bracket is made through the corresponding hole in the PK using screws. One of the PK connections provides a modular connection for RDF 300. The joint between the EPK and the PK is sealed with rubber rings. In this modular assembly, the units are used to control shut-off valves.

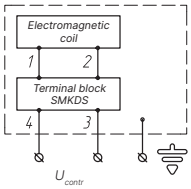


EPK 300.200 unit: controlling the shut-off valve actuator with fixing position of valve stem in case of emergency shutdown of pneumatic power supply by normally closed EPK 300

The optional introduction of OK 200 check valve in EPK 300.300 provides an instant shut-off valve, locking the power line in the event of an emergency shutdown. When power is restored, the gears start moving from the level of emergency stop. It is also possible to reset the gears to zero position by turning off the power supply. If necessary, OK 200 provides modular connection of RDF 300.

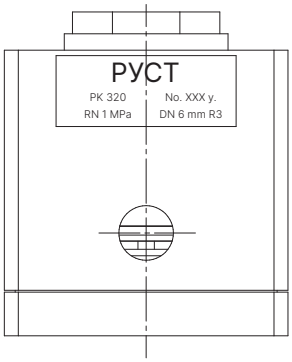


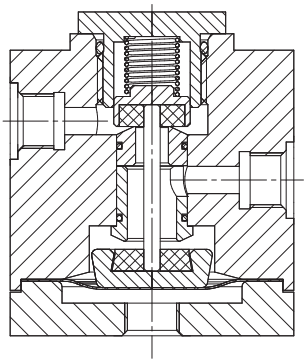


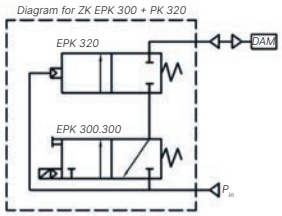


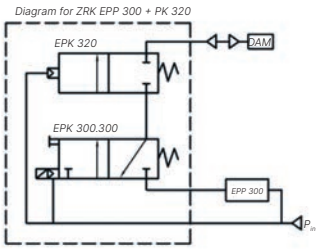
PK 320 unit: locking actuators of control or multipurpose valves during emergency shutdown or pneumatic power supply interruption.

PK 320 unit is designed to halt the control or multipurpose valve during a pneumatic emergency shutdown (interruption). When P_{in} is disconnected, the communication line with the pneumatic actuator is closed, and the actuator stops in its current position. Upon resuming the pneumatic supply, P_{in} restores the communication line with the actuating mechanism, and movement resumes from the stopping point. Compatible with both EPK and EPP/PPP.



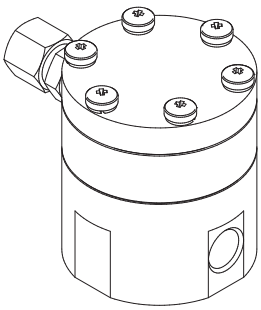


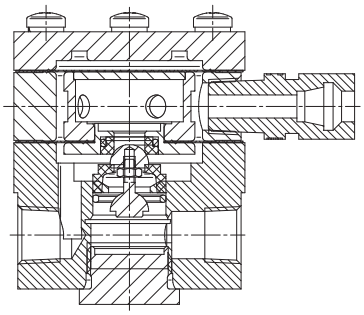


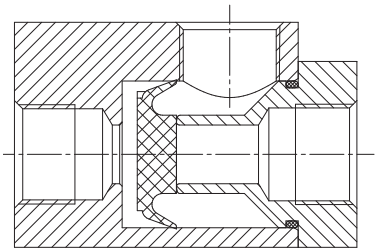


PK 320-1, PK 320-2 units: flow amplifiers for accelerating pneumatic actuators of control or multipurpose valves. PK 320-3: rapid exhaust valve.

PK 320-1/2/3 units are designed to increase the flow rate to/from the actuator when the flow characteristics of the control solenoid or positioner are insufficient. The PKs replicate the control signal pressure and compensate for potential actuator leaks without involving the positioner. Compatible with both EPK and EPP/PPP.







Technical parameters

Name		EPK 300.100		EPK 300.310 EPK 300.311	EPK 300.300 EPK 300.301	EPK 300.200	PK 320	
Product composition		EPK 300.01 AB 100		EPK 300.01, PK 310, AB 300, PK 311	EPK 300.01, PK 300, PK 301	EPK 300.01, PK 300, OK 200	PK 320, PK 320-2	PK 320-1
Nominal pressure, MPa		0 to 1			0.03 to 1			
Nominal diameter, DN, mm		1.5		6				12
Air pollution class		1.3		1; 3; 5				
Maximum flow rate, m^3/h		0.6		12				30
Leakage range, cm^3/min		0.3		0.6				
Pneumatic connection		G 1/8, GE08LR 1/8 A3C (Parker)						NPT 3/4
Supply voltage and power consumption	A	= 24 V ± 10% up to 4 W ~24 V ± 10% up to 4 VA					–	–
	B	= 48 V ± 10% up to 6 W ~48 V ± 10% up to 6 VA						
	C	= 110 V ± 10% up to 10 W ~110 V ± 10% up to 10 VA						
	D	= 220 V ± 10% up to 10 W ~220 V ± 10% up to 10 VA						
Cable connection		M20×1.5 VKV040 steel						
Explosion protection type		1ExdIICT6Gb					–	–
Dust and moisture protection level		IP65						
Continuous operation time		100%						
Body material		Alloy: AMS2204 anodized						
Climatic design		NF 1						
Weight, kg		1	1	1.3	1.5	1.4	0.5	1.5

KVD 610d and 610i explosion-proof two-position limit switch

KVD 610d and 610i two-position limit switches represent a further advancement of their predecessor, KVD 600. In the new KVD modification, the majority of customer operating service feedback and requests have been addressed.

Use

Two-position signaling of direct and rotary pneumatic actuators by means of electric microswitches for control and shut-off pipeline valves.

Setting range

5 to 130 mm (5° to 100°)

Unique features

01

Enhanced position fixation mechanism, cam mechanism accuracy ±0.2°.

02

Possibility to order the KVD with non-contact actuation sensors instead of mechanical switches.

03

Two explosion protection classes, 1ExdIICT6 Gb and 1ExiaIICT6 Gbx (with spark protection barrier), in one product.

04

Installation flexibility: adjustable feedback lever shaft positioning, direct mounting on rotary actuators per VDI/VDE 3865.

05

Possibility to switch DC or AC electrical circuits in "dry contact" mode or by NAMUR (open circuit monitoring).

06

Modification featuring PST (partial stroke test) function for timely control and diagnosis of the solenoid valve, pneumatic actuator, and friction in the gland seal or shut-off valve trim.

07

Operates at temperatures down to -60 °C.

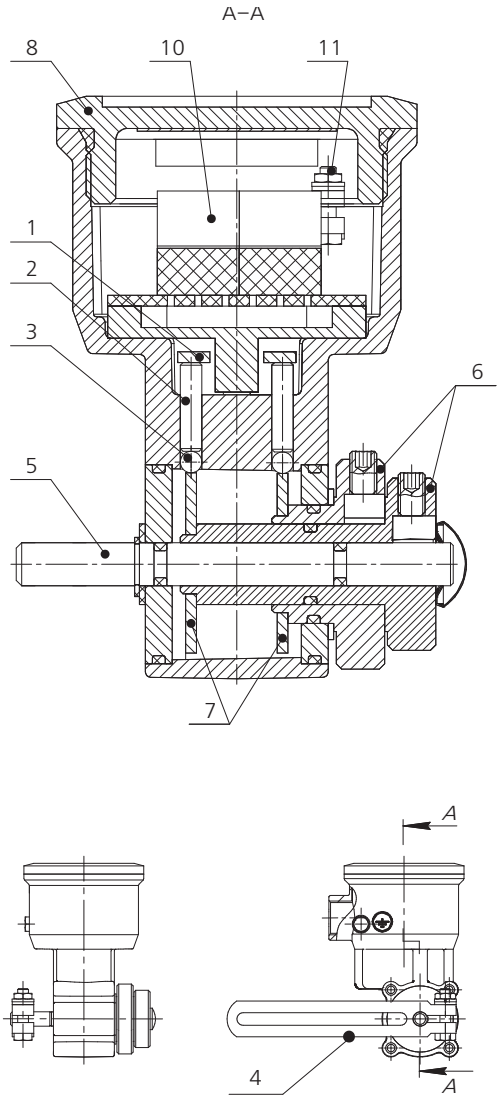
Operating principle

KVD is a cast monoblock divided into two areas: electrical and mechanical. The operating principle involves the activation of microswitches or magnetoresistive sensors by a mechanism composed of spring-loaded levers [1], pushers [2], and balls [3], which are in turn acted upon by the mechanical part of KVD, directly connected to the actuating mechanism stem. The connection is established through a lever [4], an axis [5], adjusting bushings [6], and profile cams rigidly attached to the sleeves [7].

The cover [8] allows access to the external cable installation and is secured with a locking screw.

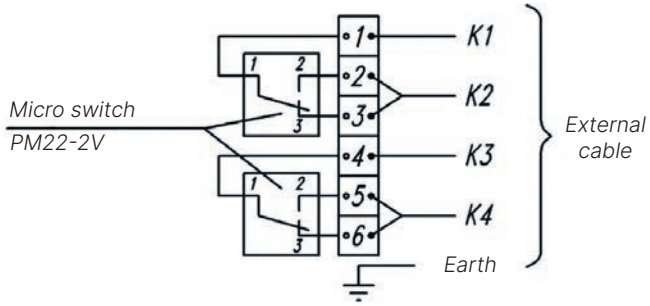
KVD is connected to external electrical circuits through a cable input and a six-position screw-type terminal block [10]. Wires from the microswitches are connected to one group of contacts, while another cable is connected to the control system.

Internal grounding is achieved by attaching a wire to the stud [11] with the appropriate set of nuts and washers. External grounding is provided by a screw.

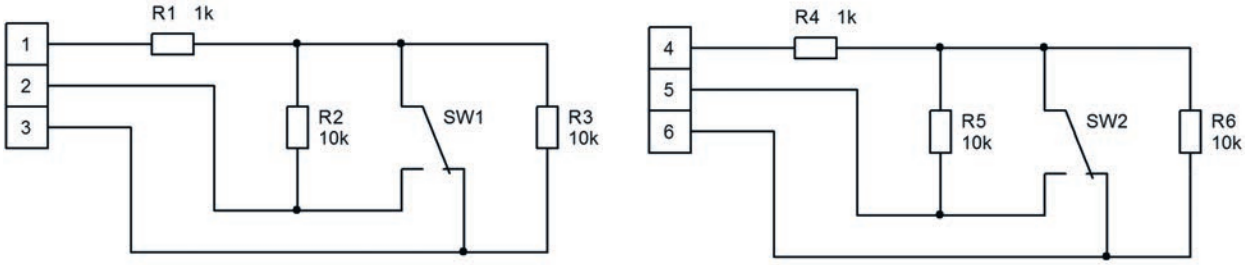


Technical parameters

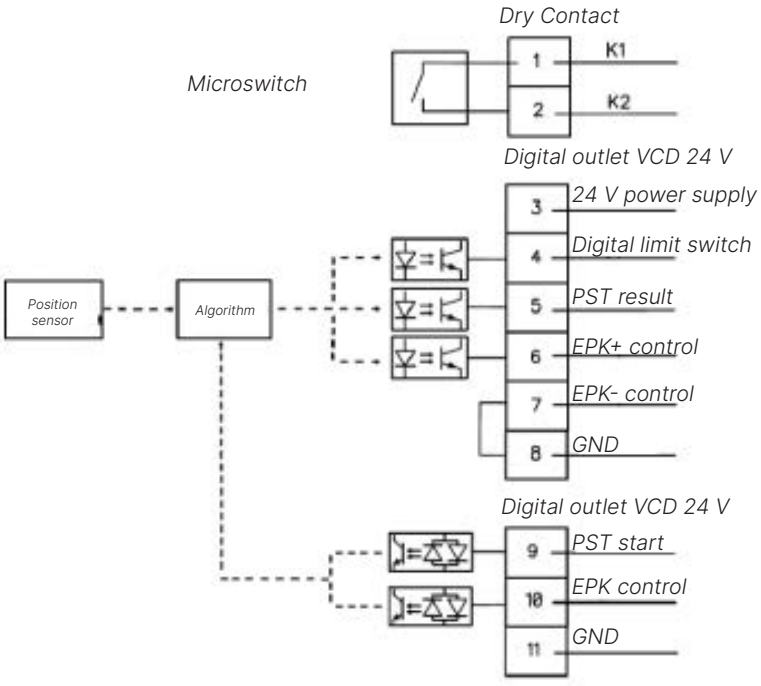
Name		KVD 610d	KVD 610i
Direct operating stroke		120 mm (90º)	
Hysteresis		1 mm (1º)	
Ambient temperature		-60 to +70 °C	
Protection against external influences		IP67	
Sensor	Contact	NC/NO microswitch	
	Non-contact	HoneyWell magnetoresistor	
Explosion protection type		1ExdIICT6 Gb	1ExiaIICT6 Gbx
Connection diagrams: Dry contact	Constant	36 V, 70 W	Ui = 28 V, Ii = 115 mA, Pi = 2 W, Ci = 0 nF, Li = 0 mH
	Alternating	220 V, 200 W	
	With circuit control (Namur)	EN 60 947-5-6	
	With partial stroke test function (PST)	24V/DOx2/DIx1	
MTBF, not less than		1.5×10,000 cycles	
Service life, not less than, years		15	
Cable entry thread		M20×1.5	
Overall dimensions, mm (L x W x H)		108 × 81 × 132	
Weight, kg		0.650	



Standard connection diagram

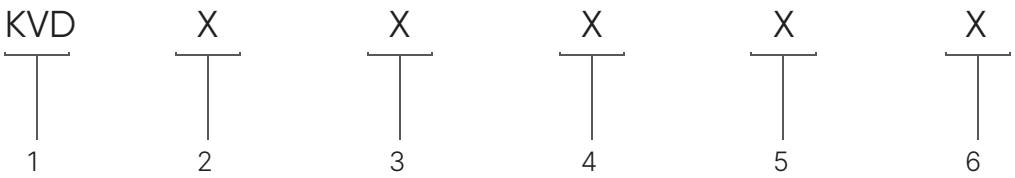


Namur wiring diagram (EN60 947-5-6)



Wiring diagram with PST controller

Symbol structure



1

Product name

KVD: two-position limit switch

2

Explosion protection type

610d: "Flameproof Enclosure" 1ExdIICT6 Gb;
610i: "Intrinsically Safe Circuit" 1ExiaIICT6 Gbx

3

Electric connection

0: "Dry Contact"
1: "Dry Contact" with LED Indication
2: according to NAMUR (EN 60 947-5-6)
3: with PST feature (only for KVD 610d)

4

Sensor type

0: contact (microswitches)
1: non-contact (magnetoresistors)

5

Installation kit

0: not included
1: for cast harp (PYCT actuators)
2: for rib or rod frame per NAMUR R
3: direct attachment to rotary actuators

6

Cable input

0: with VKV 040 M cable gland : without M20×1.5 cable gland
VKV: cable entry according to Annex 1

RDF 300 pressure reducer with filter

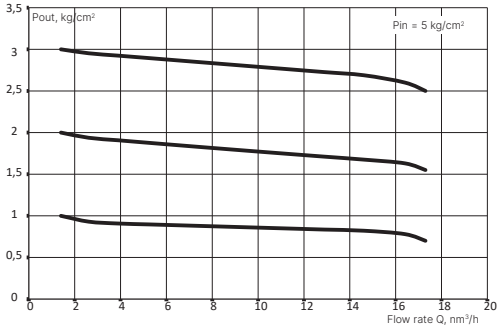
The pressure reducer with filter (RDF) is designed for air purification from mechanical impurities, condensate collection, regulation, and automatic maintenance of the set outlet pressure level for pneumatic device supply. Besides air, other gases not affecting nitrile rubber performance can be used.

Use

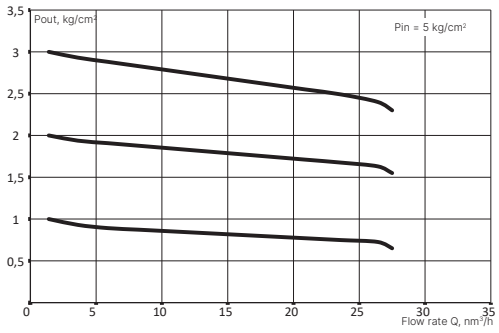
Air (gas) preparation for pneumatic systems requiring clean air and stable pressure levels in the network.

Operating principle

Air from the pneumatic line is fed through the inlet into the cavity formed by the cup and filtering element. Clean air from the cavity is supplied to the consumer through the outlet connection when the lower throttle pair of the valve is opened. Inlet and outlet connections are identical and have connection threads G1/8, G1/4. Through the throttle, outlet pressure is fed to the diaphragm cavity, balancing the force set by the spring using the adjusting screw. After adjusting, the screw is closed with a cover. During overload, outlet pressure overpowers the spring, lifting the diaphragm and the seat of the discharge part of the valve, allowing air to escape to the atmosphere through the cover opening. Condensate drainage is ensured by unlocking the plug. The standard RDF design comes with a pressure gauge, and upon request, a pressure gauge can also be installed at the RDF inlet.



RDF 300 G 1/" flow rate chart



RDF 300 1/4" flow rate chart

Unique features

01

The modular design allows for tubeless mounting on PVCT pneumatic instruments.

02

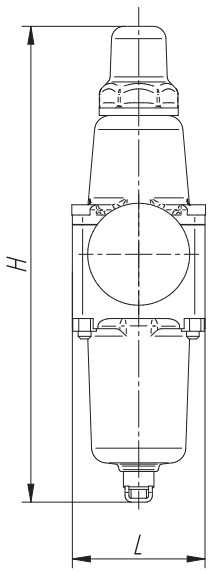
Compact size and easy installation

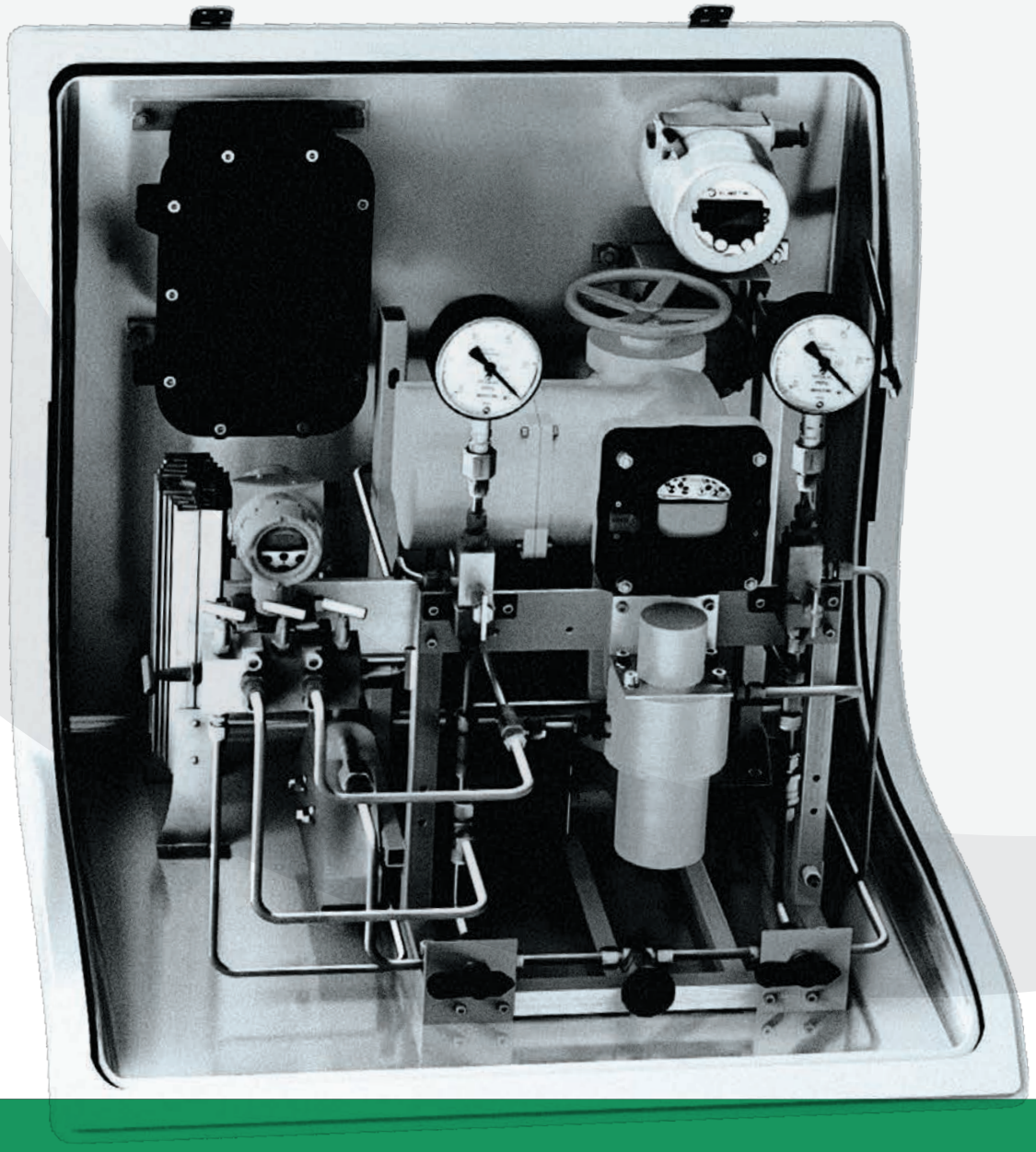
03

Operates at temperatures down to -60 °C

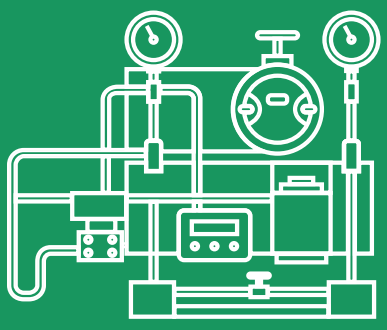
Technical parameters

Name	RDF 300 G 1/8"	RDF 300 G 1/4"
Inlet pressure P_{in}, MPa	0.1 to 1	
Pneumatic connection	G 1/8, GE08LR 1/8 A3C	G 1/4, GE08LR 1/4 A3C
Pressure gauge connection	G 1/8"	
Nominal diameter, DN, mm	4	6
Outlet pressure regulation range P_{out}, MPa	0.01 to 0.8	
Maximum flow Q_{max}, m^3/h	15	25
Inlet air contamination class according to GOST 17433-8	9	
Outlet air pollution class	0 to 1	
Purification degree, μm	10	
Ambient temperature, °C	-60 to +85	
Overall dimensions, mm (L x W x H)	52 × 85 × 185	60 × 93 × 220
Weight, kg	0.5	0.6





Modular control systems



SRPI regulated inhibitor injection system, 250, 300, and 500 series

The SRPI system is designed for distributing and dosing liquid inhibitors of various purposes to inlet points, such as gas wells, plumes, gas pipelines, multipurpose equipment, regardless of pressure fluctuations in inlet and outlet pipelines.

Operating pressure, PN

up to 50 MPa

Number of lines

1–8

Inhibitor consumption per line

1 to 1,200 kg/h

Allowable pressure drop across the valve during regulationup

to PN

Operating medium temperature

-60 to +70 ˚C (depending on the equipment used)

Flow control

auto/manual/local

Unique features

01

Use of specially
designed valve of series 400, 500 with a patented throttling circuit for micro-flow operation at high differential pressure.

02

Wide selection of technological schemes and design types: vertical, modular (for use in open areas and in workshops/premises).

03

Maintainability

Technological scheme ensuring maintenance and repair of components without removing the system and stopping the supply process.

04

Reliability

Possibility of maintaining the flow rate for a long time in case of failure of the electric or pneumatic actuator.

05

Versatility

Wide range of electric actuators, pneumatic actuators and instrumentation by various manufacturers and types.

06

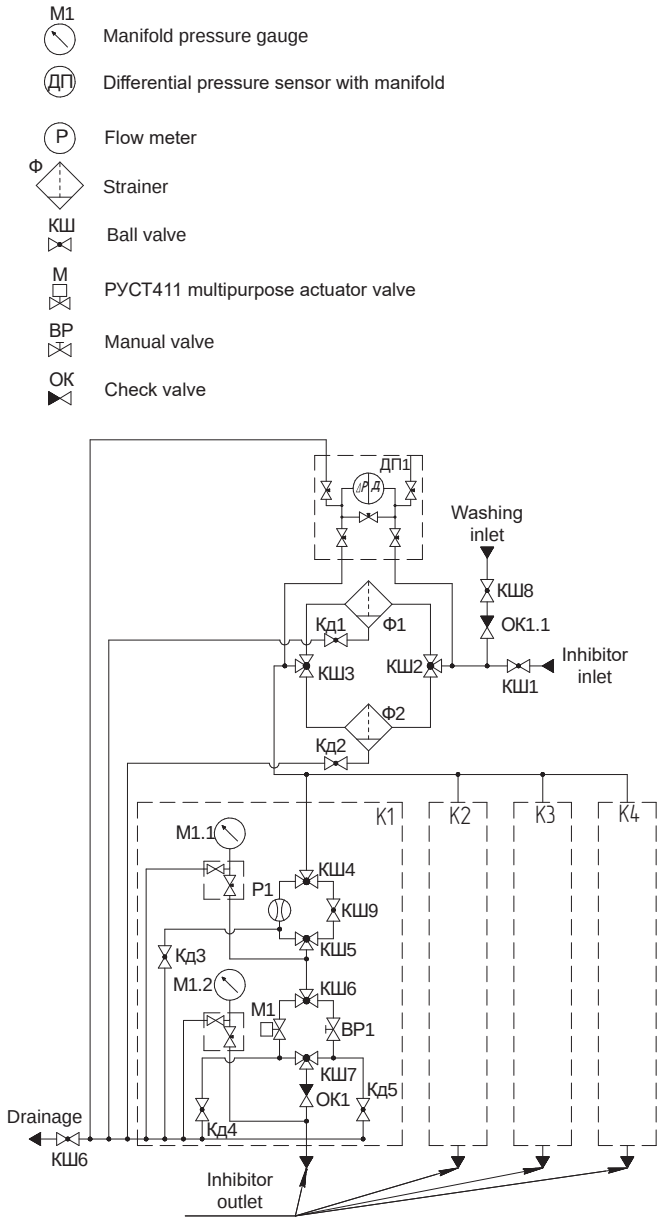
Filtering system

Use of a specially designed filter with an integrated bypass valve, preventing filter element damage during critical clogging (pressure differential across it).

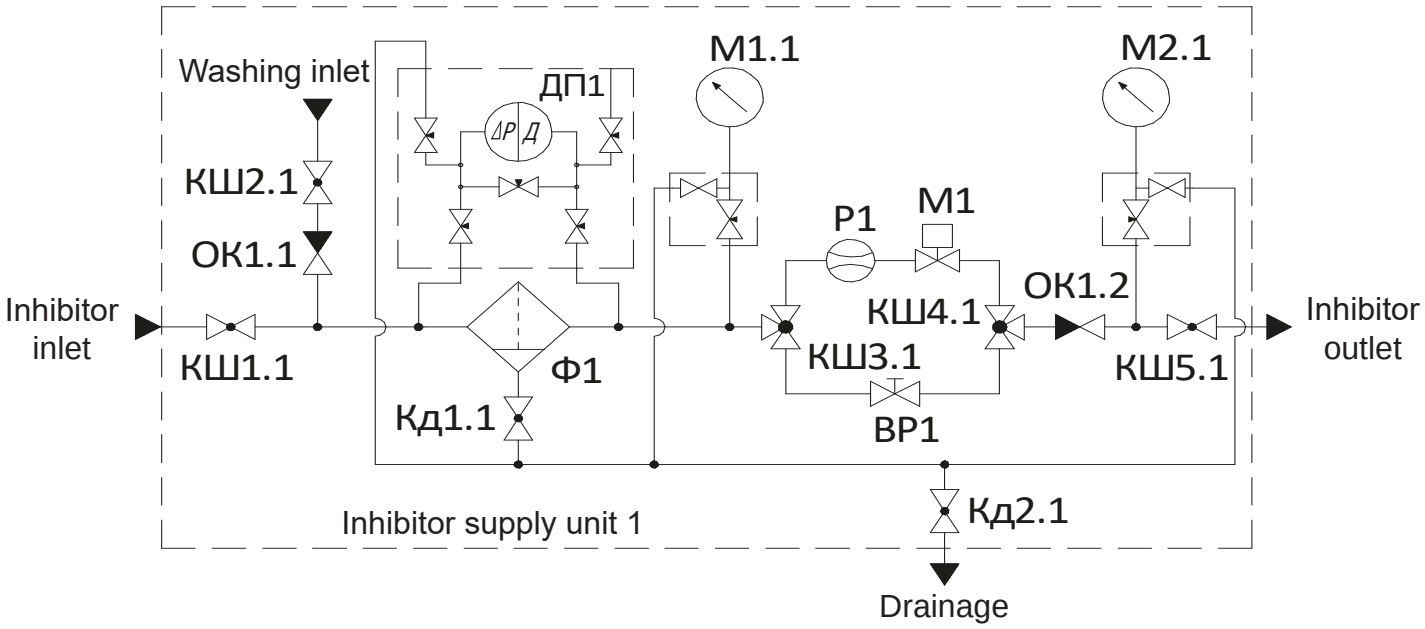
Operating principle
using the presented schematic as an example

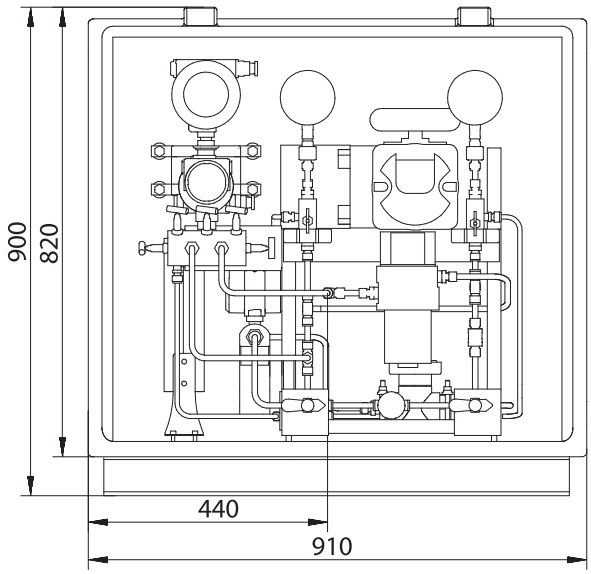
The SRPI system is designed to operate under the control of the object DCS or local automation systems. The inhibitor from the pump unit is supplied to the product inlet at a pressure exceeding the gas flow pressure. F1 and F2 filters for mechanical inhibitor cleaning are installed at the inlet, with a DP1 differential pressure sensor on them. The inlet pipeline is then divided into four analogous inhibitor dosing channels. The inhibitor is fed to the flow meter R1 (mass or volume) through the ball valve BV4. BV6 and BV7 valves direct the flow to either 410-3 manual control valve line or 410-2 multipurpose valve line. The automatic control system receives data from the flow meter R1 and adjusts the inhibitor flow rate according to an external set point or a flow rate value determined by its own exclusive algorithm (when provided with an integrated automatic control system). Direct flow adjustment is carried out by 410-2 valve with an intelligent electric or electropneumatic actuator. In case of actuating valve failure, lack of power or control signal, flow maintenance can be achieved with 410-3 manual valve. The control system also obtains a signal from the DP pressure differential sensor on the filter to check the filter element clogging.

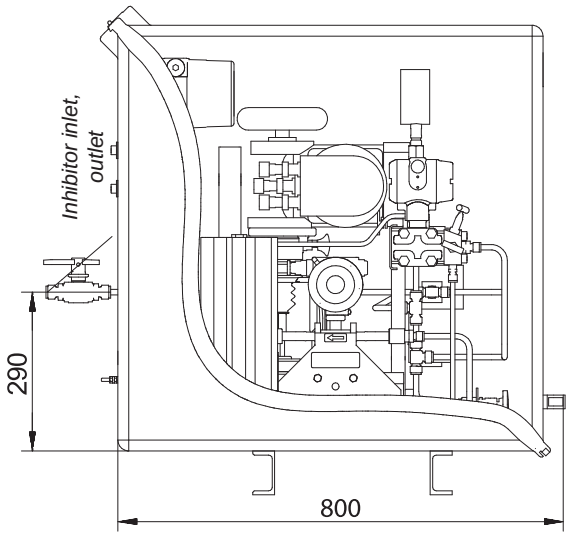
For continuous operation, all system components requiring preventive or diagnostic maintenance (filter, pressure sensor, pressure gauge, flow meter, and control valve) are fitted with bypass and drain lines. The unit features channel-by-channel indication of inlet/outlet pressure and differential. The modular SRPI has a similar operating principle but with several differences due to its use in field conditions (directly at well sites).



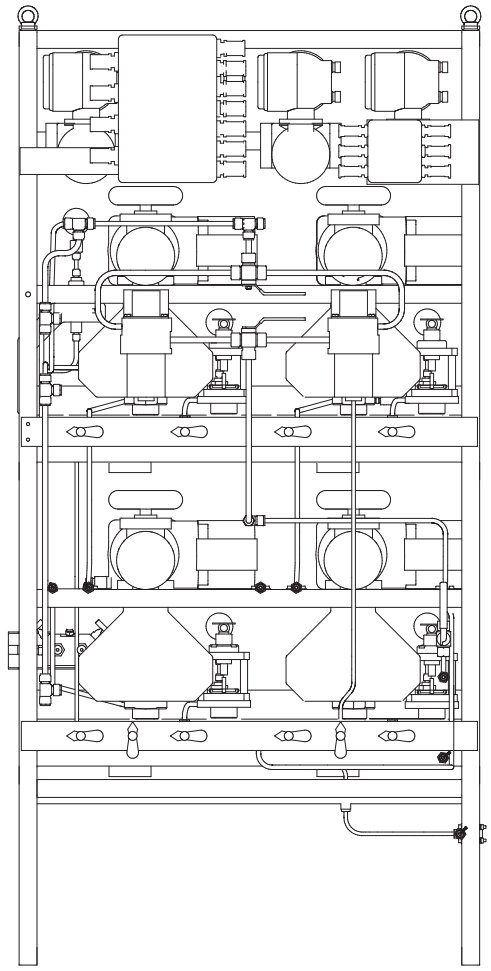
Vertical design



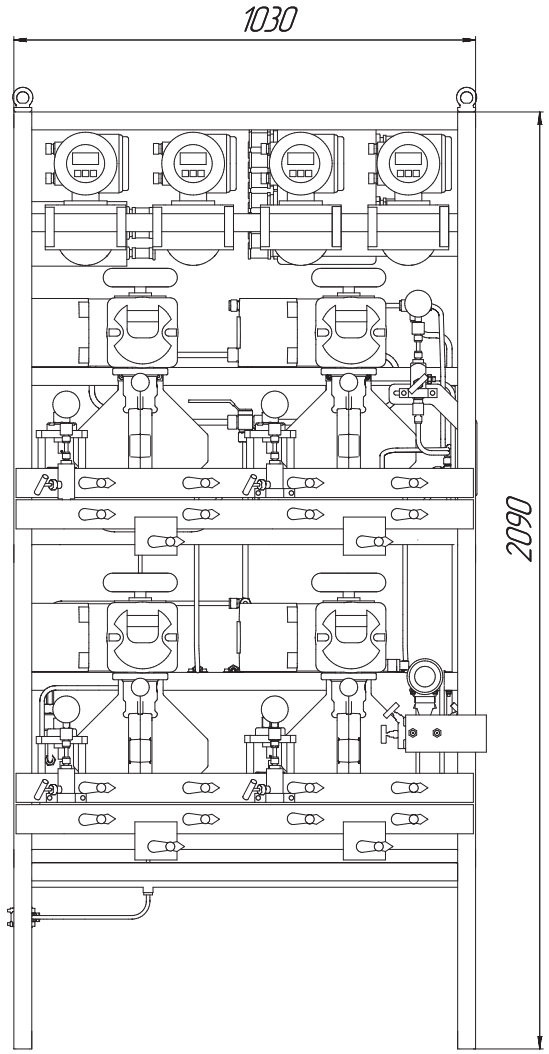




Modular design in cabinet



Rear view



Front view

Vertical design (schematic on page 133)

Technical parameters

Parameter		Value
Operating medium		Methanol, glycols, and their mixtures
Operating medium pressure[1], max., MPa		50
Ambient temperature[2], °C		-60 to +70
Operating medium temperature, °C		-50 to +70
Number of independent input points, pcs.		1 to 8
Inhibitor flow rate per channel, m^3/h		0.001 to 1.2
Relative error in flow maintenance, %		±1
Actuating mechanism power supply	pneumatic, MPa (kgf/cm^2)	0.14 to 0.6 (1.4 to 6)
	electrical, V	24/220/380
Nominal supply voltage of control systems, V		24
Control signal[3] Iy, mA		4 to 20
Feedback signal[3]	Qos current flow rate, mA	4 to 20
	Xr current position of control element, mA	
	dP pressure drop across the filter, mA	
Current type		Direct
Supply voltage deviation from nominal, %		±10
Electrical equipment design		Explosion-proof
Overall dimensions, mm (L x W x H)	Horizontal	2,300 × 600 × 1,265
	Vertical	1,030 × 480 × 2,100
	Modular	700 × 700 × 850; 900 × 800 × 900
Weight, no more than, kg		460

[1] The maximum operating medium pressure is determined by using pipelines, control, shut-off, and metrological devices of the necessary pressure class up to 50 MPa.

[2] The operating temperature range is determined by the applied component base of the required climatic design.

[3] The use of field buses, communication protocols, and measurement of monitored parameters is possible upon agreement with the customer.

Symbol structure

РУСТ® SRPI X XX X X X X X XX XXXX XXX

1 2 3 4 5 6 7 8 9 10 11

1

SRPI

Regulated inhibitor injection system

2

Operating medium pressure, max., MPa

- 25
- 32
- 50

3

Inhibitor input channels count

1–8

4

Total flow rate in kg/h or l/h (refer to item 5)

0–4,800

5

Flow type

- V: Volumetric
- M: Mass

6

Actuator type

- E Electric
- P Pneumatic
- M Manual

7

Structural design

- M: Modular
- V: Vertical
- H: Horizontal

8

Protection from external impacts

C: Placement in cabinet

9

Presence and quantity of inhibitor injection devices

I1: single injector

10

Presence of a local automatic control system

LACS

11

Climatic design

N, F, NF

Example of a symbol

SRPI250-3-200M-E M C LACS NF(1). Maximum operating medium pressure 25 MPa (250 kgf/cm^2), 3 channels, flow rate 200 kg/h, mass, electric actuator, modular design, in cabinet, inhibitor injection devices: 3 pcs., local automatic control system, climatic design NF(1)

BDR active chemical dosing unit

BDR is intended for delivering the required amount of inhibitor using dosing pumps to entry points — gas wells, loops, gas pipelines, multipurpose equipment prone to hydrate formation, corrosion, and paraffin deposition.

Operating pressure, PN up

to 25 MPa

Allowable pressure drop across the valve during regulation up to

PN

Number of lines

2 operating lines, 2 reserve lines

Operating medium temperature

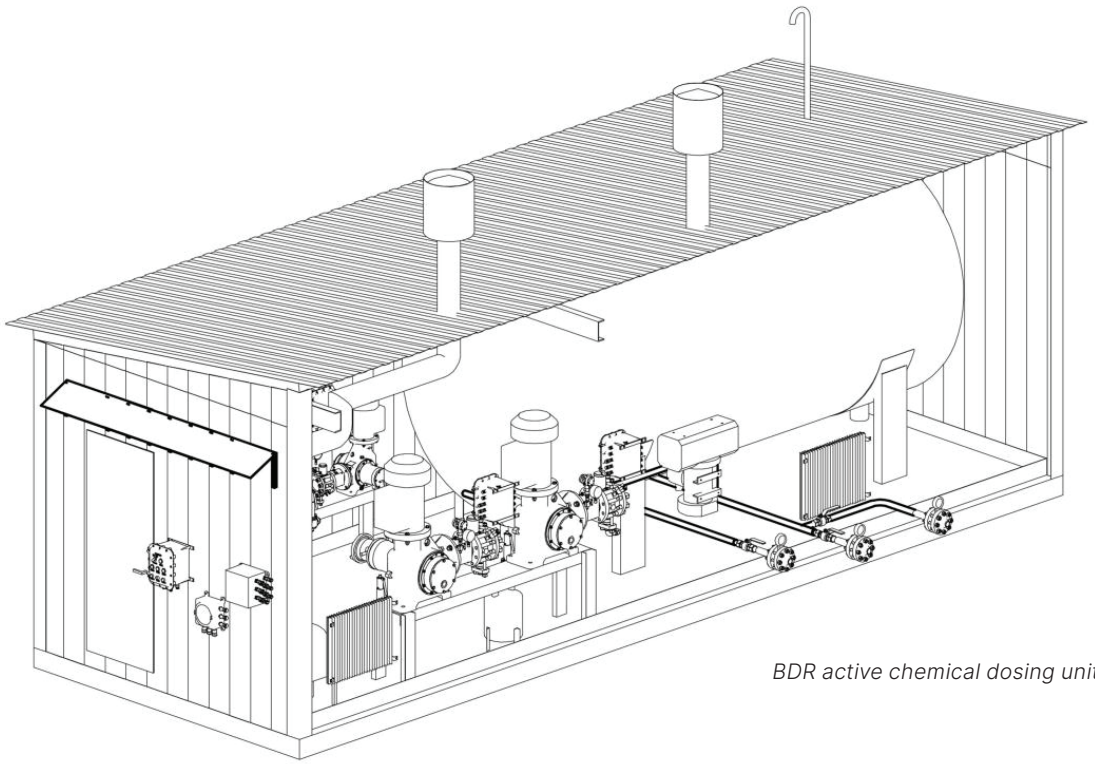
-60 to +70 °C
(depending on the equipment used)

Inhibitor consumption per line, l/h

0.2 to 2000

Flow rate control:

automatic/manual



BDR active chemical dosing unit

Unique features

01

Using flow sensors enables online control of expensive reagent consumption.

02

Using modern technology metering pumps increases the unit lifespan.

03

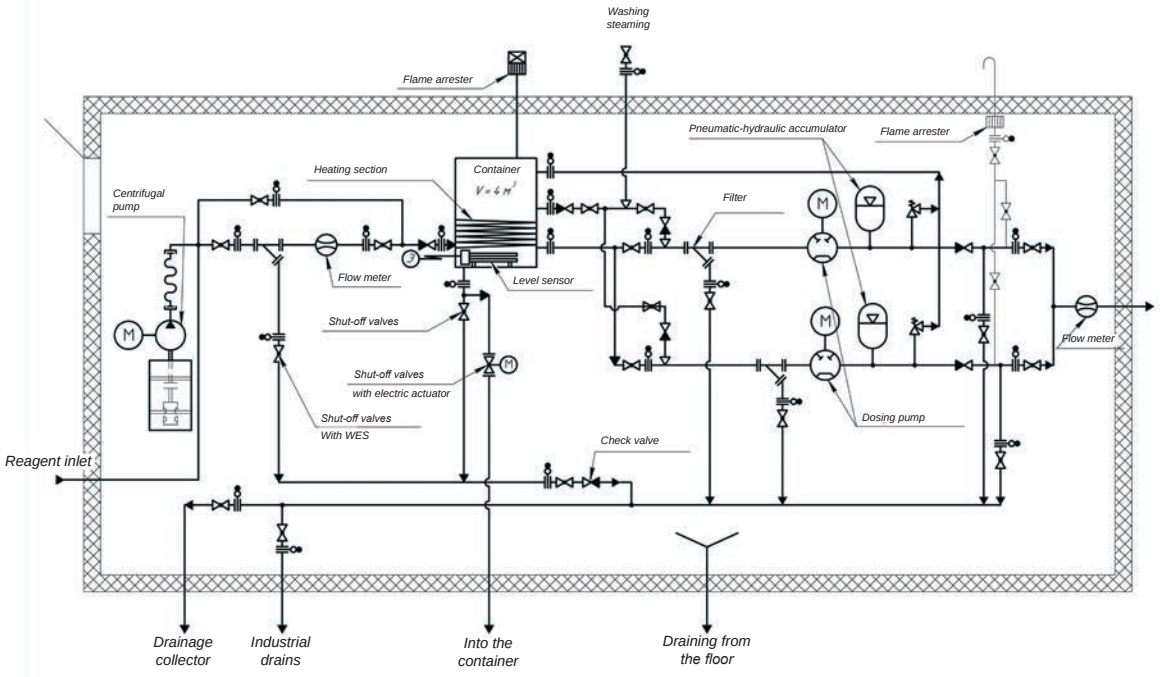
Unit design, manufacturing, and assembly tailored to the Customer's specific conditions.

04

Comprehensive dosing process solutions from design to maintenance.

05

Incorporating modern, high-quality technological equipment and instrumentation in unit layouts.



BDR arrangement example

Operating principle

The unit is module-designed with a frame, covered with sandwich panels. The block-box contains: dosing equipment, heaters, control and measuring instruments, visual level gauge, ventilation, 150 mm high baffle, input-output switchgear, and a heater. Outside of the unit are control posts for lighting, fan, manual fire alarms, light and sounders, terminal boxes, canopies over entrances and equipment. The block-box construction allows for installation on a pile foundation. Cable penetrations and entries in the block-box are designed for "MCS" (modular cable systems) type or equivalents. Equipment inside the technological compartments and on the exterior is in an explosion-proof design.

Primary components and systems

Dispenser pump

Electric diaphragm/plunger metering pump unit, designed for volumetric pressure dosing of neutral and aggressive media. The flow section is made of stainless steel. Explosion-proof electric motor.

Centrifugal pump

Centrifugal pump with an explosion-proof motor is designed for in-warehouse pumping.

Process piping

Material of pipes and pipelines — steel 12H18N10T (or as agreed). Filters are installed upstream of the pumps. Pulsation damper, safety valve, and check valve are installed at the outlet of the metering pumps.

Heating

The process unit is heated by explosion-proof electric heaters with an adjustable heating surface temperature depending on the ambient air temperature. The heaters automatically maintain the room temperature not lower than 10 °C. An additional heater is provided to maintain the temperature during the winter period when mechanical ventilation is in operation.

Ventilation equipment

Ventilation of the technological compartment is implemented with an axial fan and ventilation grilles. The ventilation system in the technological compartment ensures an eightfold increase in air exchange when the fan is on.

Gas alarm

Each hazardous area is equipped with a gas analyzer sensor. Explosion-proof light and sound boards "10% LELD" and "50% LELD" are installed outside the entrance to the technological and equipment compartments for gas warning.

Fire system

An explosion-proof thermal fire detector is installed in the process compartment for monitoring and transmitting fire signals to the receiving control device. A "Fire" light board is installed outside the entrance to the technological unit. A fire receiving device is installed for fire alarm control. The fire safety system is equipped with a backup power supply (BPS), ensuring uninterrupted operation for at least one day.

Measurement and control equipment

The technical pressure gauge is designed for visual monitoring of pressure in the discharge line. Process connection: M20x1.5. A 4–20 mA gauge pressure sensor with a digital display, cable glands, and valve units (or ball valves) is installed for monitoring pressure in the pressure line. Process connection: M20x1.5. A 4–20 mA differential pressure sensor with a digital indicator, cable glands, and valve units (or ball valves) is installed for monitoring filter clogging. Process connection: M20×1.5. An emergency level alarm is installed to monitor the presence of chemical upstream of the pumps. A 4–20 mA liquid flow sensor is installed to regulate the reagent flow in the discharge line (outlet manifold). The bimetal thermometer with zero adjuster is intended for visual temperature monitoring. Process connection: M20×1.5. A thermocouple is installed to monitor the temperature in the process and equipment compartments, as well as upstream of the pumps. Process connection: M20×1.5 for the discharge line (outlet manifold). The bimetal thermometer with zero adjuster is intended for visual temperature monitoring. Process connection: M20×1.5. A thermocouple is installed to monitor the temperature in the process and chemical compartments, as well as upstream of the pumps. Process connection: M20x1.5.

Technical specifications

Parameter	Value
Product name	Active chemical dosing unit
Operating medium	Methanol, MEG, wax deposition inhibitor
Allowable operating medium pressure, max., MPa	25
Reagent consumption, m^3	0.02–2
Climatic design	NF1
Explosion hazard class	No. 123-FZ 2
Explosion and fire hazard category under Federal Law No. 123-FZ dated July 22, 2008	A
Explosion hazard class according to PUE	B-1a
Responsibility level of buildings and structures under Federal Law No. 384-FZ dated December 30, 2009	Increased
Fire resistance degree (Articles 30, 87 of Federal Law No. 123-FZ)	IV
Structural fire hazard class (Articles 31, 87 of Federal Law No. 123-FZ)	C0
Functional fire hazard class (Article 32 of Federal Law No. 123-FZ)	F5.1
Explosive mixture group	IIA-T3
Power supply reliability category	III
Maximum power consumption, kW	25
Unit weight without reagent, max., kg	9,000
Maximum overall dimensions (W x L x H), mm	3,200 × 9,200 × 3,450
Power supply and lighting system	yes
Heating	yes
Ventilation	yes
Automatic fire alarm system, warning evacuation system, gas monitoring, security alarm system	yes
Automatic disconnection of all electrical devices in case of fire	yes
Monitoring the presence of liquid at the pump inlet	yes
Pressure control at the outlet of metering pumps	yes
Flow monitoring (on the manifold) at the outlet of metering pumps	yes
Pressure differential at filters (on site) / remotely	yes/yes

Symbol structure

РУСТ® BDR X X XXXX X X X X XXX

1 2 3 4 5 6 7 8 9

1

BDR

Active chemical dosing unit

2

Operating medium pressure, max., MPa

- 16
- 25

3

Number of discharge lines

1–2

4

Total flow rate kg/h or l/h

20–2,000

5

Flow type

- V: Volumetric
- M: Mass

6

Availability of reserve discharge lines

R: Reserve lines

7

Structural design

- B: Block-box
- F: On the frame (in-house)

8

Presence and quantity of inhibitor injection devices

I1: Injector

9

Climatic design

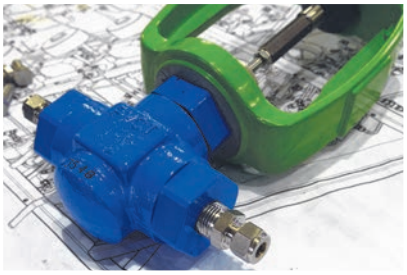
N, F, NF

Example of a symbol

РУСТ® BDR 250-2-2000M-R B, NF(1). Maximum operating medium pressure 25 MPa (250 kgf/cm^2), 2 discharge lines, flow rate 2,000 kg/h, mass, block-box design, inhibitor injection devices: 3 pcs., climatic design NF(1).

Note Sheets


РУСТ
DN50
PN63



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