



**Type**  
**A10 / A11 / A13**

DN 10 - 150  
Pp upto 20MPa

## Shut-off Bellow Valve for Nuclear Power

Butt-Welded

### Data Sheet

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## Content

Application .....	3
Technical description .....	3
Connection.....	3
Installation.....	3
Operating conditions .....	3
Testing .....	3
Operation.....	4
Table of designed and maximum operating parameters .....	4
Materials of main parts .....	5
Dimensions .....	6
Advantages of construction.....	8

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### Application

- Shut-off bellow valve A10, or controll bellow valve A11 for rough regulation with linear characteristics, or fast-acting valve A13; A10 and A13 possible to operate also in full pressure drop at the valve
- **Fluids**  
According to NP-068-05, VTP- 87/91
- **Industry**  
Nuclear power plants (especially with VVER and RBMK reactors); chemici industry
- **Environments**  
Normal, seismic

### Technical description

- Valves made of carbon steel and austenitic steel
- Forged body
- The seat in the body and the plug disc sealing are surfaced using hard cobalt-free alloy.
- The body and stem are sealed with bellows and sealing ring (expanded graphite).
- Emergency seal of the stem
- Valves DN 50-150 with cap flange
- The stem non-rotating
- Stem nut seated in two antifriction bearings

### Connection

- Butt-welded
- Other connection on request

### Installation

- The valves can be installed in any position.

### Operating conditions

- **NP-068-05 and VTP-87/91** – General Technical Requirements for purpose-made valves for NPP
- **PNAE G-7-008-89** – Rules for Construction and Safe Operation of NPP equipment and piping
- **PNAE G-1-011-97 (OPB-88/97)** – General Requirements for NPP Safety Assurance
- **PNAE G-7-002/86** – Strength Calculation Norms for NPP Equipment and Piping
- **PNAE G-7-009-89** – NPP Equipment and Piping. Weld Joints and Overlays
- **PNAE G-7-010-89** – NPP Equipment and Piping. Inspection Rules
- **NP-031-01** – Standards of seismically resistant NPP designing

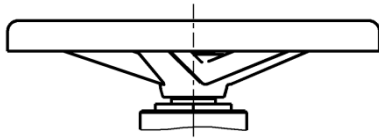


### Testing

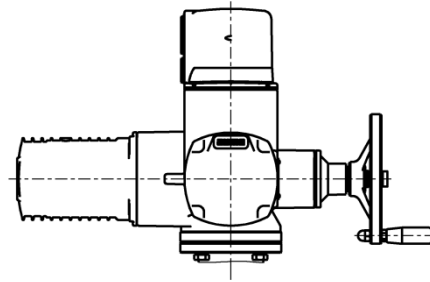
- Test of operation capability and tightness using the Pp pressure
- Leak test against ambient conditions
- Strength test:

Pp MPa	Testing fluid test MPa
2,5	4,5
4	7
6	10
8,6	14
9,2	15
11	18
12	20
14	22
18	29
20	32

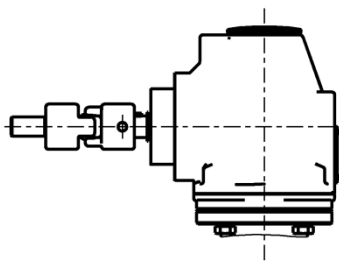
**Operation**



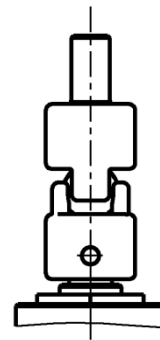
**Hand wheel**  
(with loping device)



**Electric actuator**  
(placed outside or inside the hermetic zone)



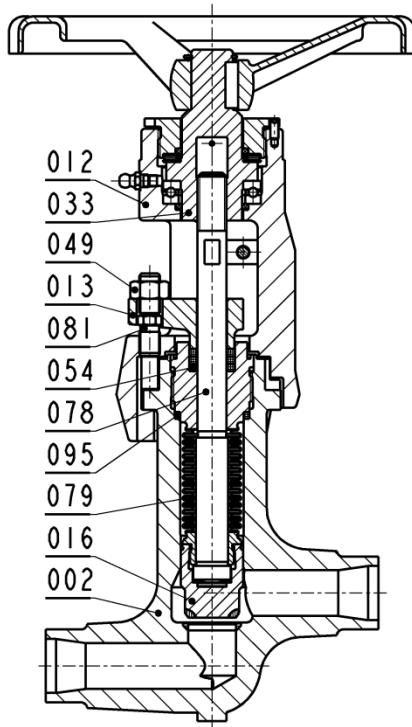
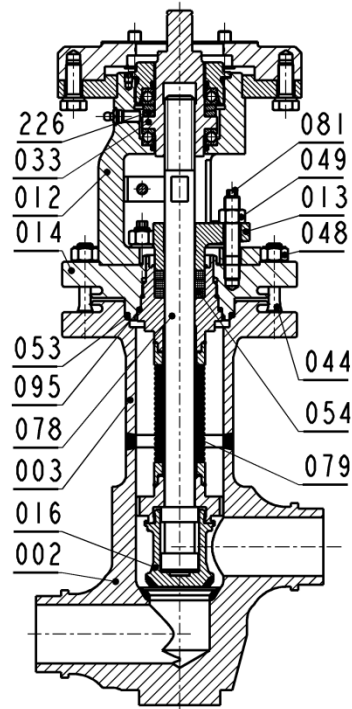
**Bevel gear**



**Direct remote control**

**Table of designed and maximum operating parameters**

Valve		Connection ends	
Max. pressure MPa	Max. temperature °C	Max. pressure MPa	Max. temperature °C
<b>Valves DN 10-150, Pp up to 4 MPa, carbon and stainless steel</b>			
4	250	2,5	250
		4	250
<b>Valves DN 10-150, Pp 4 – 12 MPa, carbon steel</b>			
12	300	6	275
		8,6	300
		9,2	300
		11	300
		12	250
<b>Valves DN 10-150, Pp 4 – 14 MPa, stainless steel</b>			
14	335	6	275
		8,6	300
		9,2	300
		11	300
		12	250
		14	335
<b>Valves DN 10-150, Pp 14 – 20 MPa, stainless steel</b>			
18	350	18	350
20	300	20	300

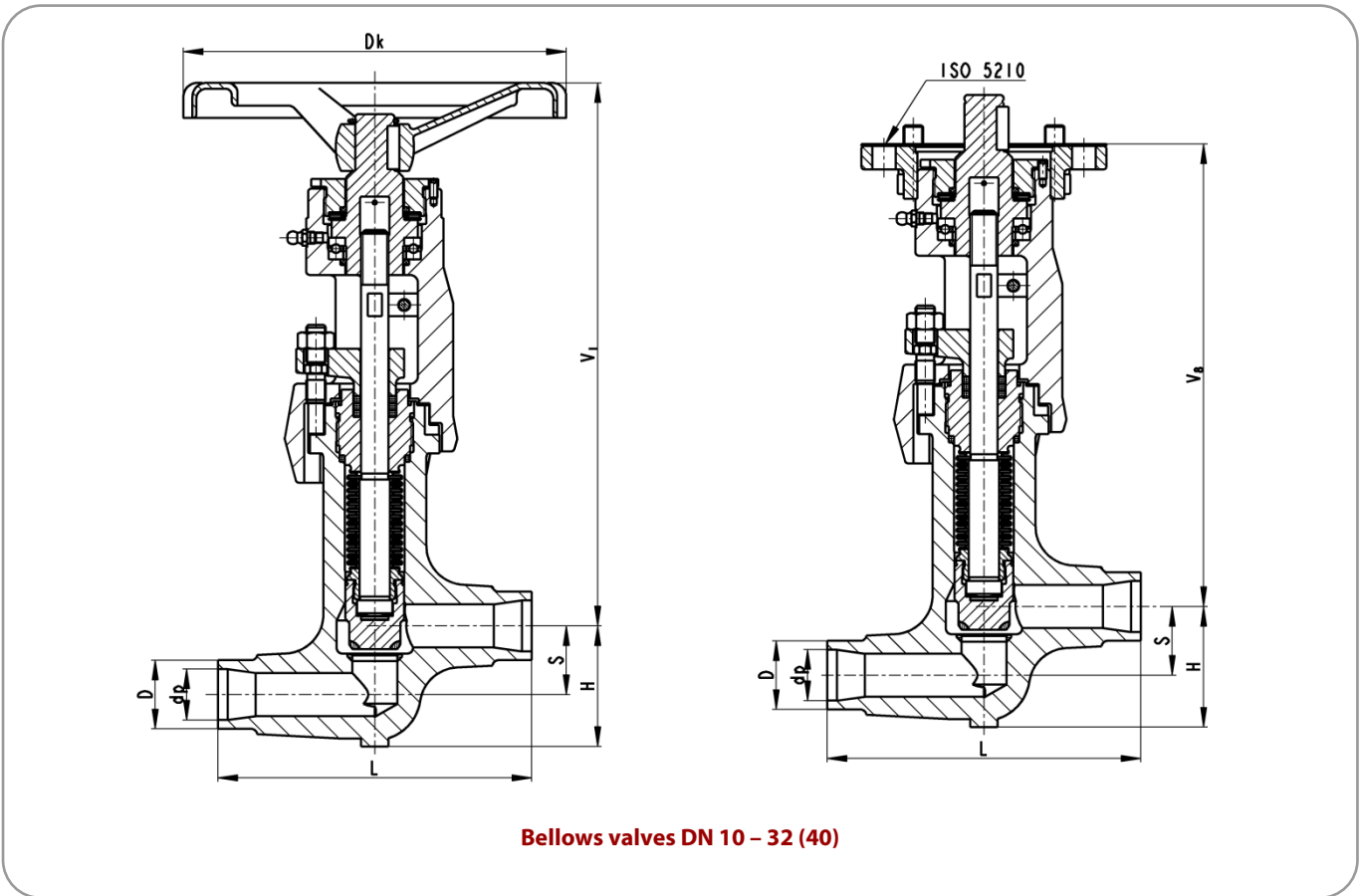
**Materials of main parts**

**Bellows valves DN 10 – 32 (40)**

**Bellows valves DN 50 – 150**

Name		Material		
002	<b>Body</b>			
003	<b>Flange</b>	11416	22K	08X18H10T
014	<b>Cover</b>			
078	<b>Stem (with bellows)</b>	14X17H2		
079	<b>Bellows</b>	W Nr. 1.4541 (X6CrNiTi18-10)		
044	<b>Bolt</b>	15320		
048	<b>Nut</b>	15236		
016	<b>Plug</b>	08X18H10T		
012	<b>Yoke</b>	422828,422743,11416, 08X18H10T		
013	<b>Seal cover</b>	422828,422743,11416		
033	<b>Stem nut</b>	423046 / 11416		
081	<b>Screw</b>	14X17H2, 17134		
049	<b>Nut</b>	ČSN EN ISO 4032		
226	<b>Spring</b>	19721, 14260		
053	<b>Sealing ring</b>	Expanded graphite		
054				
095				

Notes: The plug disc sealing are surfaced using hard cobalt-free alloy  
 Recommended spare parts to order: sealing rings (054, 095), stem with bellows (078), stem nut (033)  
 Valves DN 50 – 150 for Pp up to 4 MPa – with yoke (012) and cap (014)

**Dimensions**

**Bellows valves DN 10 - 32 (40)**

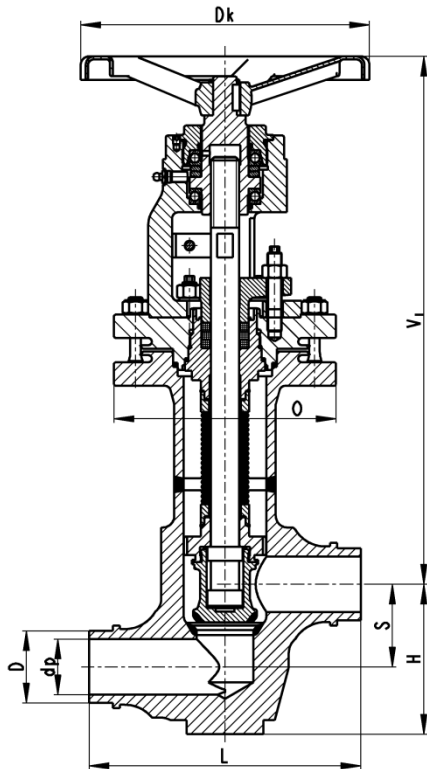


**Valves with hand-held wheel intended for electric drive and gear**

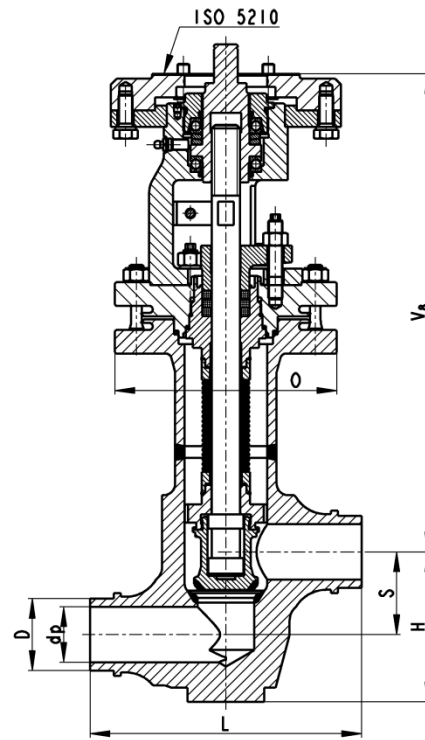
DN	Pp MPa	D	dp	Dk	H	L	O	S	V <sub>1</sub>	m <sub>1</sub> kg	V <sub>8</sub>	m <sub>8</sub> kg
10, 15	up to 4	Connection dimensions according to TP		200	43	130	80	24	237	4,1	196	4,4
20,25				200	62	160	92	35	277	7,2	236	7,5
32 (40)				250	76	180	108	45	361	10,2	270	10
10, 15	above 4 up to 14			200	43	130	92	24	281	6,1	240	6,3
20,25				250	62	160	108	35	330	9,7	284	9,5
32 (40)				250	76	180	128	45	464	16,4	376	17,8
10, 15	above 14 up to 20			200	43	130	92	24	300	6,4	259	6,7
20,25				250	62	160	108	35	351	10,3	295	10,1
32 (40)				250	76	180	128	45	433	17,3	390	18,6

Note: Construction dimensions and weighs apply to quick-acting valves

**Bellows valves DN 50 – 150**



**Bellows valves DN 50 – 150 Pp up to 4 MPa**

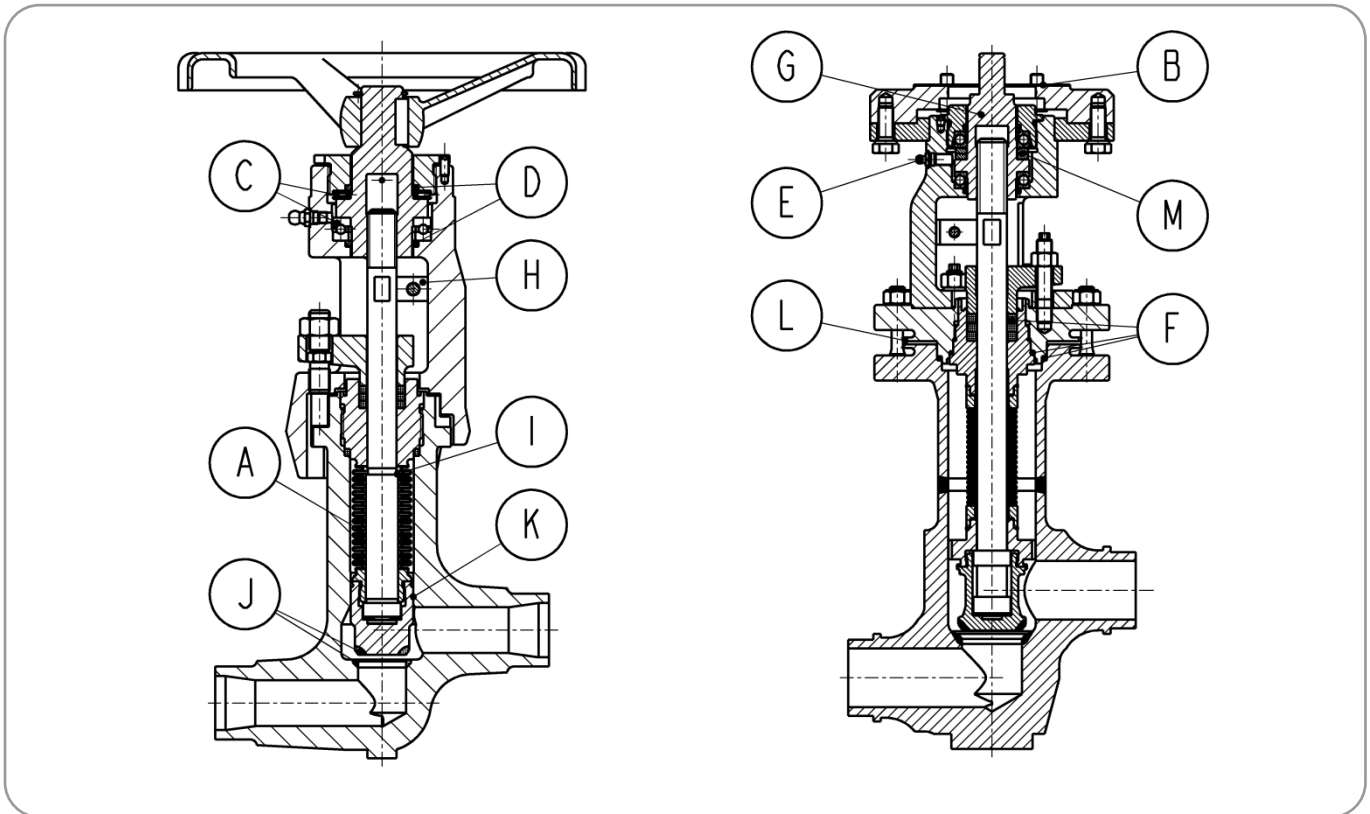


**Bellows valves DN 50 – 150 Pp above 4 MPa**

**Valves with hand-held wheel intended for electric drive and gear**

DN	Pp MPa	D	dp	Dk	H	L	O	S	V <sub>1</sub>	m <sub>1</sub> kg	V <sub>8</sub>	m <sub>8</sub> kg		
50	up to 4	Connection dimensions according to TP		250	127	230	188	70	450	33	408	40,4		
65				250	172	340	200	110	551	50	508	57		
80				500	216	380	265	140	599	104	543	111		
100				500	246	430	265	160	599	120	543	127		
125				800	322	550	352	210	857	235	864	285		
150				800	322	550	352	210	857	240	864	290		
50	above 4 up to 14			500	127	230	210	70	618	70	567	85		
65				500	165	340	265	110	700	103				
80				710	216	380	270	140	922	195	840	195		
100				710	246	430	270	160	922	209	840	199		
125											210			
150								550		210				
50	above 14 up to 20	500	127	230	210	70	700	70	667	85				
65		500	165	340	265	110	880	147						
80		800	216	380	270	140	960	208	891	195				
100		800	246	430	270	160	960	221	891	210				
125									210					
150							550		210					

### Advantages of construction



<b>A</b>	<b>The stem sealed with multi-casing bellows:</b> Perfect stem sealing
<b>B</b>	<b>Uniform connection for drives as well as for gear as per ISO 5210:</b> Possible to use control elements made by different manufacturers
<b>C</b>	<b>The stem nut seated in two antifriction bearings:</b> User-friendly, prolonged service life
<b>D</b>	<b>Dust rings:</b> Protects the bearing space against impurities
<b>E</b>	<b>Pressure lubrication:</b> User-friendly, prolonged service life of bearings
<b>F</b>	<b>Emergency seal of the stem, bellows and cap flange sealing – expanded graphite:</b> Protection against a release of medium to the surrounding area in case of failure of the bellows; reliable tightness, environment-friendly
<b>G</b>	<b>The stem nut uniform for all modes of control:</b> There is no need to dismantle the valve in order to change the mode of control.
<b>H</b>	<b>The valve position indicator:</b> Local for the purpose of orientation of the operator where the valve not controlled by electric drive. Possible to install a remote indication of DSP position.
<b>I</b>	<b>Reverse closure of the stem:</b> Ensures the defined travel of the bellows
<b>J</b>	<b>The sealing is surfaced using hard cobalt-free alloy:</b> Long term lifespans, resistance against wear and tear, and radiation
<b>K</b>	<b>The plug guided through the body hole - plugs with aligning grooves:</b> Ensure pressure equalization and removal of service medium from the space above the plug.
<b>L</b>	<b>Tongue-and-groove sealing joint:</b> Allow to additionally, during the operation, weld the body-bellows joint or body-cap
<b>M</b>	<b>Disc springs:</b> Makes it possible to alleviate inertial effects upon the turning down the electric drive, and compensate the heat expansion