

## USER MANUAL

<b>BELLOW VALVE</b>	<b>Fig. 234, 235, 237</b>	<b>Edition: 1/2023</b> <b>Date: 01.07.2023</b>
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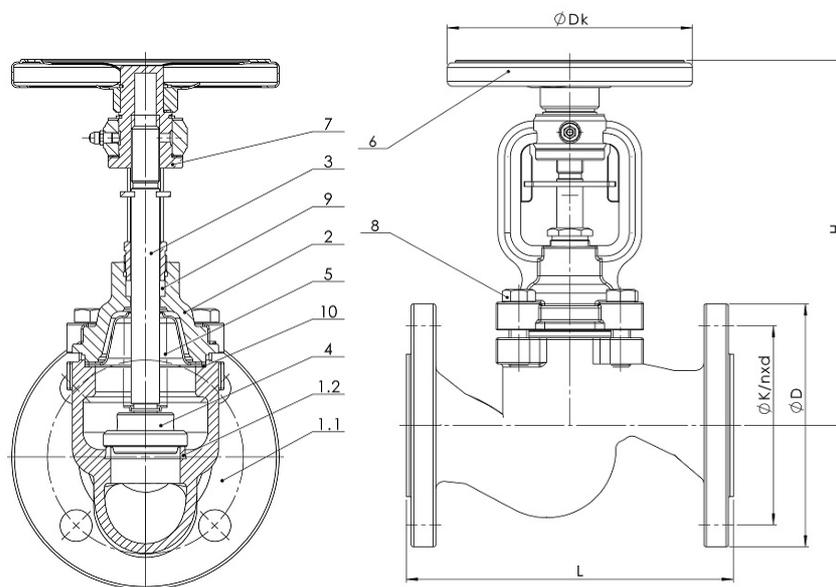
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### 1. PRODUCT DESCRIPTION

Bellow sealed globe valves are made in various variants, they act as stop valves and throttling valves. Stop valves are only used to close and open the flow, throttling valves are used for flow control. Stem sealing is performed by flexible bellow and additional protecting gland.

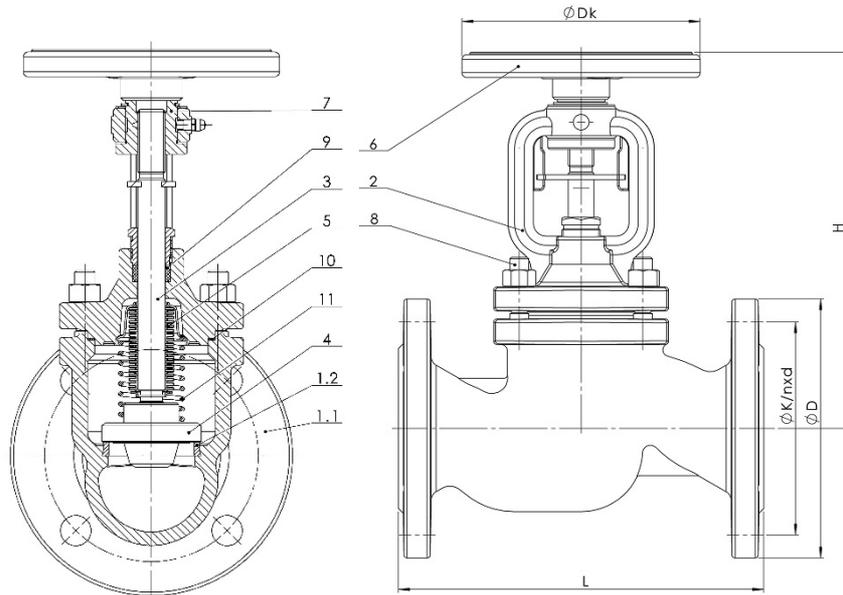
Fig.234 A, C



	Body material	A	C
	Type	01; 04; 71	01; 04; 71
1.1	Body	EN – GJL-250 5.1301 (ex. JL1040)	EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)
1.2	Seat ring	X12Cr13 1.4021	
2	Bonnet	EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)	
3	Stem	X20Cr13 1.4021	
4	Disc	X20Cr13+QT 1.4021	
5	Bellow	X6CrNiMoTi-17-12-2	

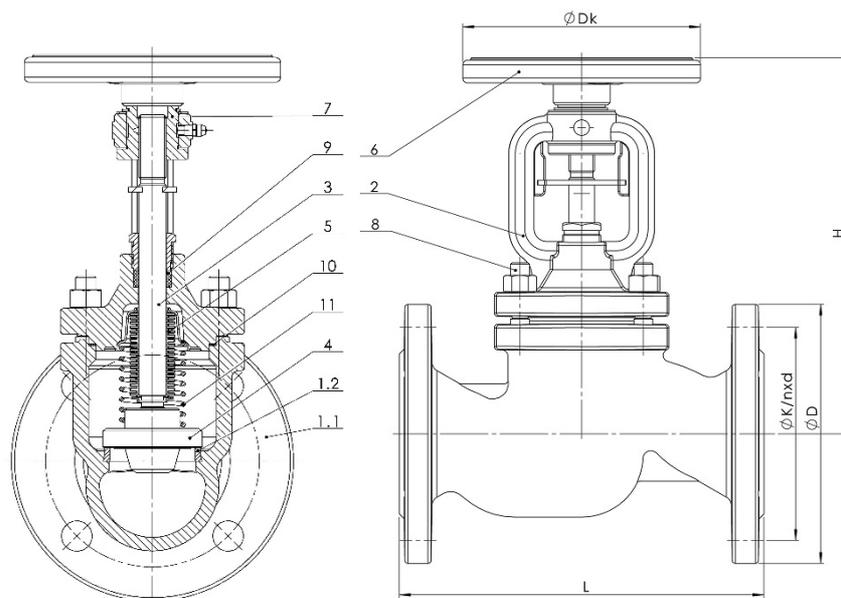
6	Hand-wheel	Steel	
7	Sleeve	11SMnPb30	
8	Hexagonbolt	5.6	A2-70
9	Glandpacking	Graphite	
10	Bonnetgasket	Graphite+ CrNiSt	
<b>Max. temperature</b>		<b>300°C</b>	<b>350°C</b>

Fig.234 F DN15-200



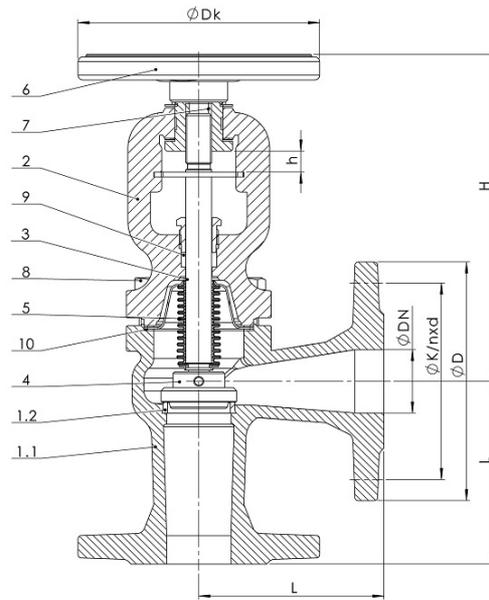
Body material		F			
Type		01	04	31	71
1.1	Body	GP240GH			
1.2	Seat	G199 LSi			
2	Bonnet	GP240GH			
3	Stem	X20Cr13 1.4021			
4	Disc	Stop disc X20Cr13 +QT 1.4021	balancing disc X20Cr13 +QT 1.4021	SDNR X20Cr13 +QT 1.4021	throttling disc X20Cr13 +QT 1.4021
5	Bellow	X6CrNiMoTi17-12-2			
6	Hand-wheel	Steel			
7	Sleeve	11SMnPb30			
8	Studbolt, nut	25CrMo4			
9	Glandpacking	Graphite			
10	Bonnetgasket	Graphite			
11	Spring	-----	-----	X17CrNi16-2 1.4057	-----
<b>Max. temperature</b>		<b>450°C</b>			

Fig.234 I DN15-200



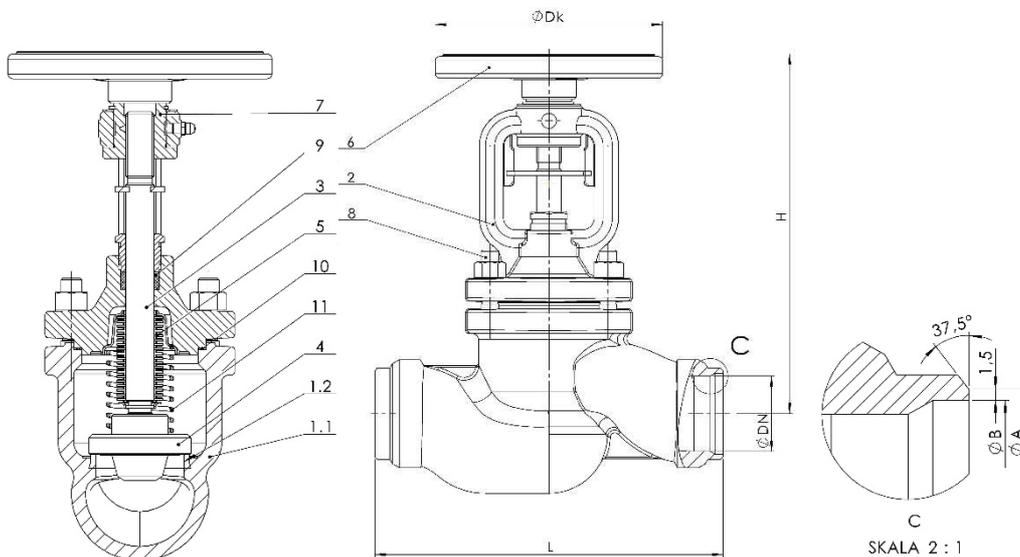
Body material		I			
Type	01	04	31	71	
1.1	Body	G-X5CrNiMo19-11-2 1.4408			
1.2	Seat	G 19 9 L Si			
2	Bonnet	G-X5CrNiMo19-11-2 1.4408			
3	Stem	X6CrNiMoTi17-12-2 1.4571			
4	Disc	Stop disc X6CrNiMoTi17-12-2 1.4571	Balancing disc X6CrNiMoTi17-12-2 1.4571	SDNR X6CrNiMoTi17-12-2 1.4571	Throtlling disc X20Cr13 +QT 1.4021
5	Bellow	X6CrNiMoTi17-12-2 1.4571			
6	Hand-wheel	Steel			
7	sleeve	11SMnPb30			
8	Bolt, nut	A4-70			
9	Glandpacking	Graphite			
10	Bonnetgasket	Graphite			
11	Spring	----		X17CrNi16-2 1.4057	---
Max. temperature		400°C			

Fig.235 A, C



	Body material	A	C
	Type	01; 04; 71	01; 04; 71
1.1	Body	EN – GJL-250 5.1301 (ex. JL1040)	EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)
1.2	Seat ring	X12Cr13 1.4021	
2	Bonnet	EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)	
3	Stem	X20Cr13 1.4021	
4	Disc	X20Cr13+GT 1.4021	
5	Bellow	X6CrNiMoTi-17-12-2	
6	Hand-wheel	Steel	
7	Sleeve	11SMnPb30	
8	Hexagonbolt	5.6 A3A	A2-70
9	Glandpacking	Graphite	
10	Bonnetgasket	Graphite+ CrNiSt	
<b>Max. temperature</b>		<b>300°C</b>	<b>350°C</b>

Fig.237 F, I



Body material		F		I	
Type		01; 04 71	31	01; 04 71	31
1.1	Body	GP240GH 1.0619		G-X5CrNiMo19-11-2 1.4408	
1.2	Seat	G199 LSi		G199 LSi	
2	Bonnet	GP240GH 1.0619		G-X5CrNiMo19-11-2 1.4408	
3	Stem	X20Cr13 1.4021		X6CrNiMoTi17-12-2 1.4571	
4	Disc	X20Cr13 1.4021		X6CrNiMoTi17-12-2 1.4571	
5	Bellow	X6CrNiMoTi17-12-2 1.4571			
6	Hand-wheel	Steel			
7	Studbolt	25CrMo4		A4-70	
8	Nut	25CrMo4		A4	
9	Glandpacking	Graphite			
10	Gasket	Graphite			
11	Spring	-----	X17CrNi16-2	-----	X17CrNi16-2
<b>Max. temperature</b>		<b>450°C</b>		<b>400°C</b>	

The bellow sealed valves have a permanent marking in accordance with the requirements of the standard PN-EN19. Marking facilitates technical identification and includes:

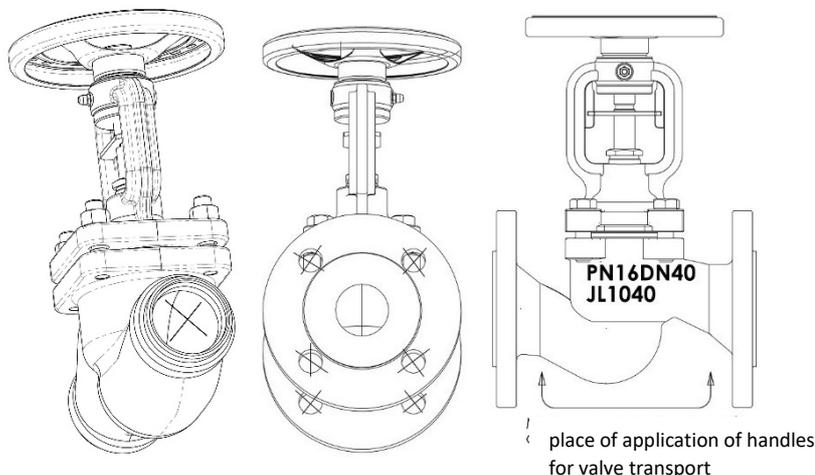
- nominal diameter DN (mm),
- nominal pressure PN (bar),
- identification of the body and cover material,
- arrow indicating the direction of flow,
- symbol of the manufacturer,
- date of casting,
- CE mark for valves subject to Directive 2014/68/UE. The CE mark only from DN32
- UKCA mark for valves subject to Regulation 2016 UK Nr. 1105. UKCA mark with unit number from DN 32

## 2. REQUIREMENTS FOR MAINTENANCE STAFF

Staff assigned to assembly, operating and maintenance should be qualified to perform this work. When using actuators on the valve, the operating instructions for actuators must be observed. If during the operation of the valves, hot parts of the valve, e.g. the handwheel, parts of the body or the cover may cause burns, the user is obliged to protect them against touching..

## 3. TRANSPORT AND STORAGE

Transport and storage should be carried out at temperatures from  $-20^{\circ}$  to  $65^{\circ}$ C, and the valves must be protected against external forces and damage to the paint coat. The paint coating is designed to protect the valves against corrosion during transport and storage. The valves should be stored in rooms free of dirt and protected against atmospheric influences. In damp areas, use a drying agent or heating to prevent condensation. The valves should be transported in such a way as not to damage the handwheel or valve stem.



It is unacceptable to fasten lifting devices to connection holes and internal through holes.

#### 4. FUNCTION

The valve types with a stop disc are used to shut off the flowing medium. The shut-off-return valves not only function as stop valves, but also as check valves. Versions with a throttling disc allow for flow control.

#### 5. APPLICATION

- industry, shipbuildingindustry, chemicalindustry
- heating
- power engineering
- refrigeration, air conditioning
- industrial water
- steam
- compressedair
- diathermicoil,
- glycol
- neutralfluids

The working factor causes the use of certain materials or not. The valves are designed for normal conditions of use: - normal flow depending on the type of medium (no excessive noise, cavitation, choked flow evaporation) - normal operating temperatures - low corrosivity of the flowing medium In the case of operating conditions exceeding these requirements, such as in the case of aggressive or abrasive agents, the user should ask the manufacturer before placing an order. The valves have an allowance for corrosion - 1mm

When selecting valves for a specific medium, the "List of Chemical Resistance" available on the manufacturer's website next to the catalogue cards may be helpful.

Acc EN 1092-2	PN	---		-10°±120°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C		
EN-GJL-250	16	bar	---		16	14,4	12,8	11,2	9,6	---	---		
EN-GJS-400-18 LT	16		---		16	15,5	14,7	13,9	12,8	11,2	---		
	25		---		25	24,3	23	21,8	20	17,5	---		
Acc EN 1092-1			-40°÷<-10°C	-10°÷50°C	100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C	
GP240GH	40	bar	30	40	37,1	35,2	33,3	30,4	27,6	25,7	23,8	13,1	
Acc EN 1092-1				---	-60°÷<-10°C	-10°C÷100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C
G-X5CrNiMo19-11-2	40		---	40	40	36,3	33,7	31,8	29,7	28,5	27,4	---	

The operating pressure must be adjusted to the maximum temperature of the medium as per the table below.



The system designer, construction contractors and the user are responsible for the correct selection of valves for the working conditions, their arrangement and assembly.



The valves are designed for applications independent of external conditions. If there is a risk of corrosion caused by external conditions (weather, aggressive vapors, gases, etc.), special anti-corrosion protection or special design of the valves is recommended.



Valves made of GP240GH cast steel operating at temperatures above 400°C, due to material creep, cannot operate in these conditions for more than 100,000 hours

## 6. ASSEMBLY

The following rules must be observed during installation:

- before installation, determine whether the valves are not damaged during shipment or storage,
- make sure that the used valves are suitable for working conditions and media in the given plant,
- remove plugs if there are any,
- for welding the valves must be protected from splashes and the used plastics from excessive heat,
- steam lines must be routed in such a way as to prevent the accumulation of water; to prevent water hammer, use a condensate separator,
- when painting the pipeline, protect the valve stem components,
- valves can be installed in any position, recommended position of the valve with the handwheel up,
- before starting the system, and in particular after repairs, flush the pipeline system with the valve fully open to remove solids or welding spatter harmful to the sealing surfaces,
- installing a strainer before the valve increases the certainty of its proper functioning.



The GP240GH cast steel valves must not be installed as the end element of the pipeline if the valve temperature is lower than minus 10°C or higher than 400°C.



The pipeline to which the valves are fitted should be arranged and mounted in a way that the valve body is not subjected to bending moment and stretching



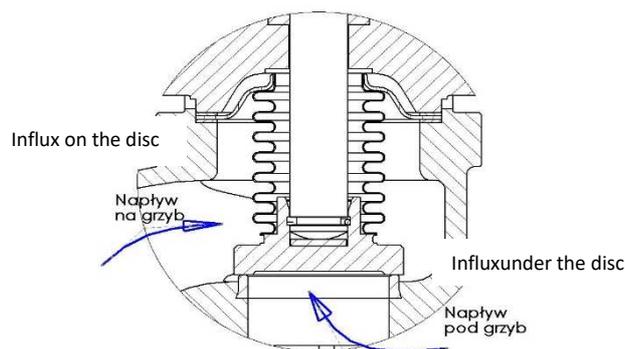
Bolted connections on the pipeline must not introduce additional strength stresses resulting from their excessive tightening, and the type of materials of the fasteners must be adapted to the operating parameters of the installation,



Pay attention to the medium flow direction, marked with an arrow on the body, and the flow direction is determined according to the following rules:

The connection of the valves by welding and the type of the required heat treatment is the responsibility of the contractor or the operator of the installation. Welding of valves to the pipeline should be performed by persons with appropriate qualifications (all welders must have valid qualifications confirmed by qualification documents issued by JN in accordance with the recommendations of the relevant part of the PN-EN 287-1: 2011 standard), using appropriate measures according to the technology developed by the contractor installation while maintaining the conditions specified in the standard PN-EN 13480-4: 2005 Metal industrial pipelines - Part 4: Fabrication and assembly.

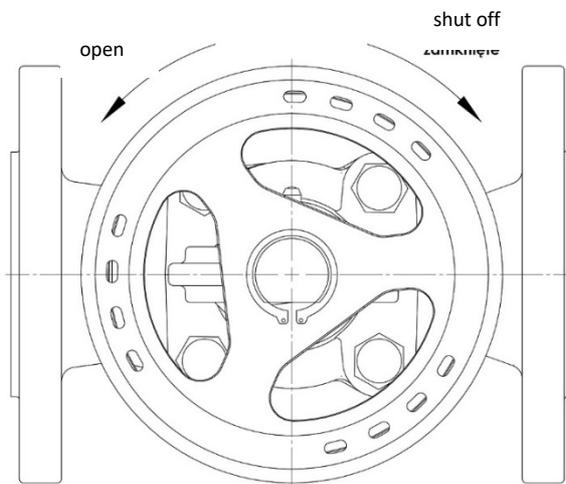
	Stop valve	Throttling valve	Stop valve	Throttling valve
	PN6 – PN25	PN16 – PN25	PN40	PN40
Under the disc	DN15 – DN150	DN15 – DN200	DN15 – DN100	DN15 – DN200
On the disc	DN200–DN250	-	DN125 – DN200	



## 7. OPERATION

During operation, the following rules should be observed:

- commissioning process - commissioning should be conducted in a way that eliminates the occurrence of sudden changes of temperature and pressure,
- valves with an influx on the disc should be opened in such a way as to first open the relieving disc and bring the pressure equilibrium on both sides of the main plug, and only after pressure equalization, open the valve completely,
- the valve is closed by turning clockwise when looking at the handwheel from above (in the direction marked on the handwheel),

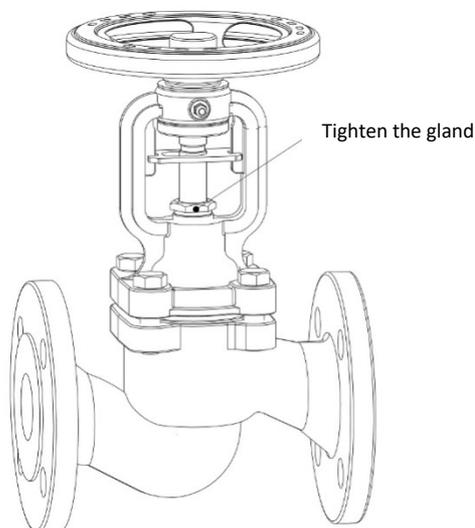


- opening occurs when turning to the left,



The use of additional leverage when turning the handwheel is prohibited.

- the operation of installed valves can be checked by repeated opening and closing,
- if there are leaks on the valve stem, tighten the packing gland until the leak stops.



If a leakage occurs at the packing gland, the bellow is damaged. The upper part of the valve should be replaced immediately.

## 8. MAINTENANCE AND REPAIR



To ensure safe operation, each valve, especially the one that is rarely operated, should be regularly inspected and maintained. The frequency of maintenance is determined by the user depending on the operating conditions, but at least once a month. Stem thread should be periodically greased.

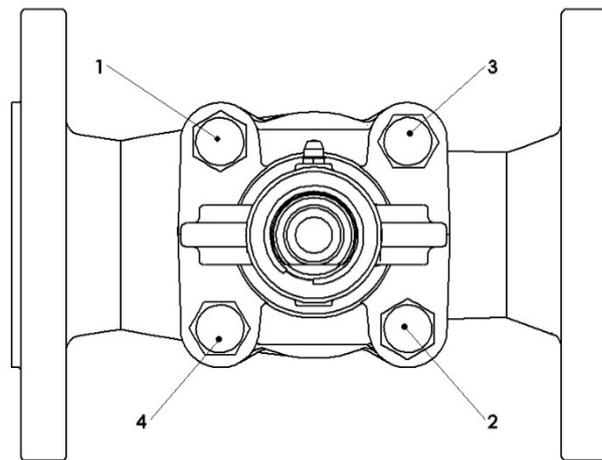
All service and repair works should be performed by qualified personnel using suitable tools and genuine replacement parts. Before removing the complete valve from the pipeline or before maintenance, the given pipeline section should be put out of service. For maintenance and repair work:

- reduce the pressure to zero and the valve temperature to the ambient temperature,
- use personal protective equipment appropriate to the risk involved,
- after removing the valve, replace the seals with which the valve is connected to the pipeline system,



Be careful when touching the gasket between the valve body and the bonnet. The gasket contains stainless steelstripe that may cause injury

- each time after removing the valve bonnet, clean the surfaces for the gaskets and use new gaskets of the same type as the previously installed ones. The manufacturer of the valve adopted the seal parameter  $m = 1.3$  for the calculation of the flanged hull-cover joint
- tightening the bolt connections of the bonnet should be performed with the valve open,
- bolts or nuts should be tightened evenly and crosswise with a torque wrench,



- Tightentorques

Bolt	Torque
M8	15-20
M10	35 -40
M12	65 – 70
M16	140 -150
M24	350-400
M30	400-500

- Before re-assembling the valves into the pipeline, it is necessary to check the valve function and the tightness of all connections. The tightness test should be carried out with water at a pressure equal to 1.5 times the nominal pressure of the valve.

## 9. CAUSES OF OPERATIONAL DISTURBANCES AND THEIR REMOVAL

When searching for causes of faulty operation of the valve, it is essential to comply with the safety regulations

<b>Disturbance</b>	<b>Possible cause</b>	<b>Removal</b>
No flow	Closed valve	Open the valve
	The flange caps have not been removed	Remove flange caps
Poor flow	Valve not open enough	Open the valve
	Dirty filter	Clean or replace the mesh
	Pipeline system clogged	Check the pipeline
Difficult valve control	Dry stem	Grease the stem
	Gland packing too tight	Slightly loosen the gland nuts
Leakage on the stem	Damage of the bellow	Tighten the gland until it is tight. Replace the upper part of the valve as soon as possible.
Leakage on the seat	Incorrect closing	Tighten the handwheel without using any auxiliary tools
	Damaged socket or disc	Replace the valve. Turn to supplier or manufacturer.
	Too much pressure difference	Use a valve with a pressure relief disc. Check whether the valve is installed in accordance with the flow direction marked on the valve.
	Medium contaminated with solids	Clean the valve. Install the filter before valve.
Connection flange fracture	The fastening bolts were tightened unevenly	Install a new valve

In the event of leakage of a medium that is not neutral to the environment, protective measures must be taken.

## **10. VALVE SERVICE DISCONTINUITY**

Valves are made of recyclable materials. Deliver them to a recycling centre.

## **11. GUARANTEE CONDITIONS**

ZETKAMA grants a quality guarantee ensuring the proper functioning of its products, provided that they are installed in accordance with the user's manual and operated in accordance with the technical conditions and parameters specified in the ZETKAMA technical sheets. The guarantee period is 18 months from the date of installation, but not longer than 24 months from the date of sale.

Assembly of third party parts and construction changes made by user as well as natural wear are not covered by the guarantee.

The user should inform ZETKAMA about hidden defects immediately after they are found.

The complaint must be made in writing.

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