

## USER MANUAL

**CHECK VALVE**

**Fig. 287, 288**

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Fig.287

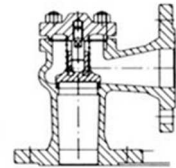
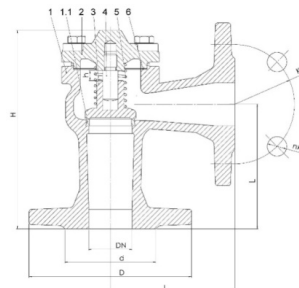
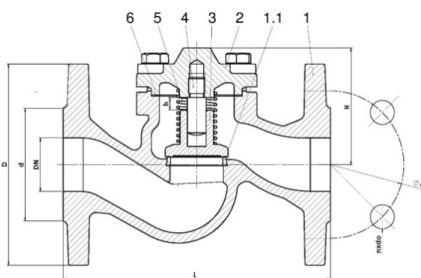


Fig.288

### 1. PRODUCT DESCRIPTION

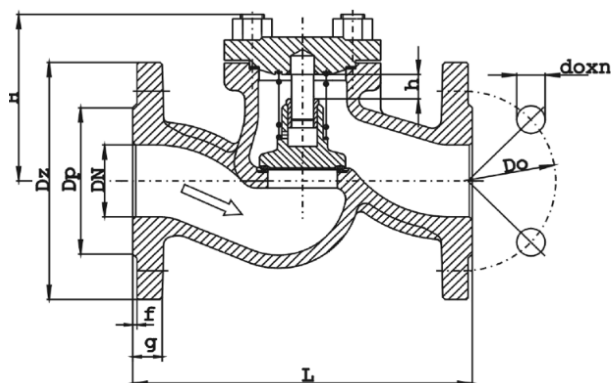
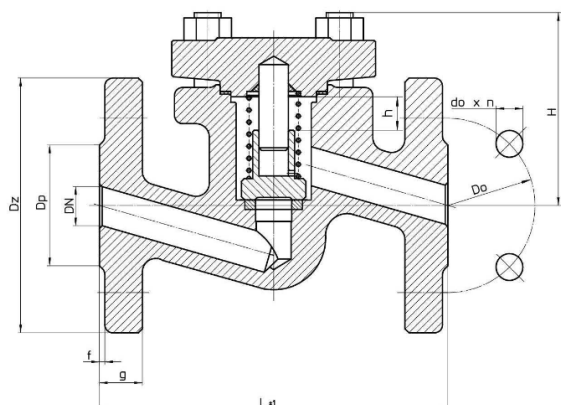


	Body material	A	C	A	C	E
	Type	31; 41		33; 43		32
1	Body	EN – GJL-250 5.1301 (ex. JL1040)	EN – GJS-400-18 5.1303 (ex. JS1025)	EN – GJL-250 5.1301 (ex. JL1040)	EN – GJS-400-18 5.1303 (ex. JS1025)	CuSn5Zn5Pb5-C
1.1	Seat ring	X20Cr13 1.4021		CuSn10		CuSn5Zn5Pb5-C
2	Cover	EN – GJL-250 5.1301 (ex. JL1040)	EN – GJS-400-18 5.1303 (ex. JS1025)	EN – GJL-250 5.1301 (ex. JL1040)	EN – GJS-400-18 5.1303 (ex. JS1025)	CuSn5Zn5Pb5-C
3	Disc	X12Cr13 1.4021		CuSn10		DN15-32 CuZn35Ni DN40-300 CuSn5Zn5Pb5-C
4	Stem	X12Cr13 1.4021		CuSn10		DN15-32 CuZn35Ni DN40-300 CuSn5Zn5Pb5-C
5	Spring	X17CrNi16-2 1.4057		CuSn6		-
6	Gasket	Graphite CrNi				FA1
<b>Max. temperature</b>		<b>300°C</b>	<b>350°C</b>	<b>225°C</b>		

**Fig. 287 PN40**

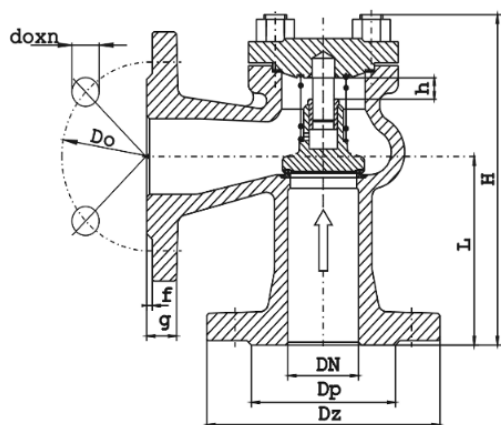
Body material M DN 15-25  
Body material G DN 15-50

Body material I DN 32-300  
Body material F DN 65-300



	Body material	G DN 15-50	F DN 65-300	M DN 15-25	I DN 32-300
	Type	31	31	31	31
1	Body	P245GH	GP240GH	X6CrNiTi18-10	GX5CrNiMo19-11-2
2	Cover	P265GH	P265GH	X6CrNiTi18-10	X6CrNiTi18-10
3	Disc	18-8 CrNi	18-8 CrNi	18-10 Cr-Ni	18-8 CrNi
6	Gasket	Graphite			
<b>Max. temperature</b>		<b>450°C</b>	<b>450°C</b>	<b>400°C</b>	

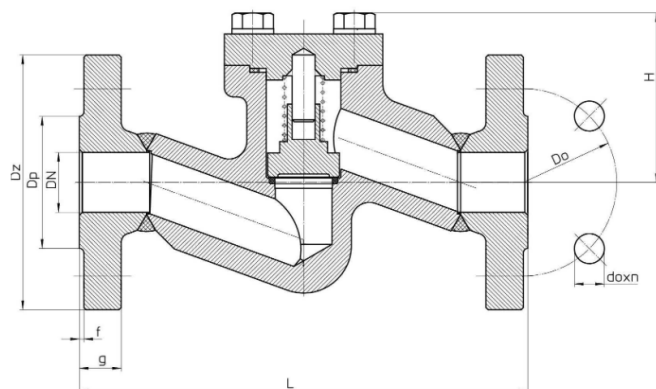
**Fig. 288 PN40**



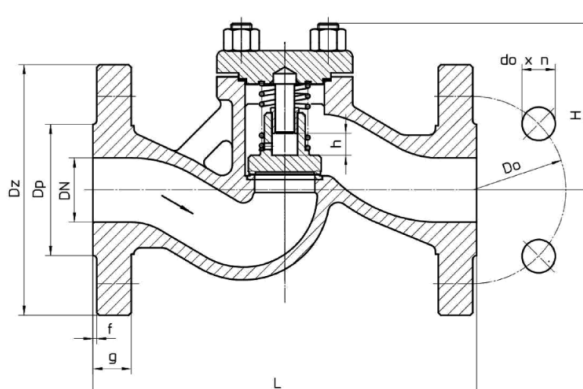
	Body material	F DN 15-250	I DN 15-250
	Type	31	31
1	Body	GP240GH	GX5CrNiMo19-11-2
2	Cover	P245GH DN 15-50 P265GH DN 65-250	X6CrNiTi18-10
3	Disc	X20CR13 DN 15-25 18-8 CrNi DN 32-250	X6CrNiTi18-10
6	Gasket	Graphite	
<b>Max. temperature</b>		<b>450°C</b>	<b>400°C</b>

**Fig. 287 PN63-160**

DN 15-25 PN63, 100  
DN 15-50 PN160



DN 32-200 PN63, 100  
DN 65-200 PN160



	Body material	G	F	Q	Q
	Type	31	31	31	31
	PN	63 – 100 DN15-25 160 DN15-50	63 – 100 DN32-200 160 DN65-200	63 – 100 DN15-25 160 DN15-50	63 – 100 DN32-200 160 DN65-200
1	Body	P245GH	GP240GH	13CrMo4-5	G17CrMo5-5
2	Seat ring	18-8 CrNi			
3	Cover	P265GH		13CrMo4-5	
5	Seat disc	X20Cr13		13CrMo4-5	
6	Gasket	Grafit			
	Max. temperature	450°C			550°C

Valves are provided with casted marking according to the requirements of PN-EN19 standard. The marking facilitates technical identification and contains:

- diameter nominal DN (inch),
- pressure nominal PN (bar),
- body and cover material marking,
- arrow indicating the direction of flow,
- manufacturer marking,
- heat number
- CE marking, for valves covered by Directive 2014/68/UE. CE marking starts from DN32.

The allowable leakage during leak test of cast iron valves specified in EN 12266-1 may be:

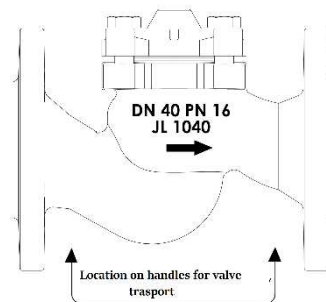
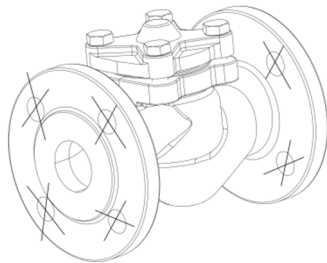
- a) in fittings with soft sealing - no visible leakage
- b) in fittings with metal seats -  $2\text{mm}^3/\text{s} \times \text{DN}$

## 2. REQUIREMENTS FOR MAINTENANCE STAFF

The staff assigned to assembly, operating and maintenance tasks should be qualified to carry out such jobs. If during strainer operation heat parts of the valves, for example cover or body could cause burn, user is obliged to protect them against touch.

## 3. TRANSPORT AND STORAGE

Transport and storage should be carried out at a temperature from  $-20^{\circ}$  to  $65^{\circ}\text{C}$ , and vent valves should be protected against external forces influence and destruction of painting layer as well. The aim of painting layer is to protect the valves against rust during transport and storage. Valves should be kept at unpolluted rooms and they should be also protected against influence of atmospheric conditions. There should be drying agent or heating at damp rooms in order to prevent condensate formation.



**It is unacceptable to fit lifting devices to connecting holes.**

## 4. FUNCTION

Check valves are used for one-way flow of medium and also prevent backflow.

## 5. APPLICATION

- industry
- shipbuilding industry
- chemical industry
- heating
- refrigeration, air conditioning
- industrial water
- diathermic oil,
- glycol
- steam
- compressed air
- neutral fluids

The operating medium causes an order or prohibition of use of certain materials. Strainers are designed for normal conditions of use. In the case of operating conditions exceeding these requirements, e.g. for aggressive or abrasive agents, the user should ask the manufacturer before placing an order.

**Corrosion allowance  $c_2 = 1 \text{ mm}$  was assumed in the valves**

Working pressure should be adjusted to the maximum temperature of the medium, as shown in the tables below.

Acc. EN 1092-2	PN		-60°C ÷ <-10°C		10°C ÷ 120°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C
EN-GJL250	6	bar	-----		6	5,4	4,8	4,2	3,6	---	---	---
	16		-----		16	14,4	12,8	11,2	9,6	---	---	---
EN-GJS400-18 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			-20°C ÷ <-10°C	10°C ÷ 50°C	50°C ÷ 100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C
GP240GH +N	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°C ÷ <-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	bar	40		40	36,3	33,7	31,8	29,7	28,5	27,4	---
Acc. EN 1092-3					-10-120°C	150°C	180°C	200°C	225°C	350°C	400°C	450°C
CuSn5Zn5Pb5-C	16	bar	-----		16	10	10	10	10	-----	-----	-----
	10		-----		10	6	6	6	6	-----	-----	-----
	6		-----		6	4	4	4	4	-----	-----	-----

Fig. 287 PN 63-160

Material	PN	Temperature [° C]																		
		-10 < do <50	100	150	200	250	300	350	400	450	460	470	480	490	500	510	520	530	540	550
P245GH GP240 GH	63	63	58,5	55,5	52,5	48,0	43,5	40,5	37,5	20,7	-	-	-	-	-	-	-	-	-	-
	100	100	92,8	88,0	83,3	76,1	69,0	64,2	59,5	32,8	-	-	-	-	-	-	-	-	-	-
	160	160	137	130	124	113	103	97	91	47	-	-	-	-	-	-	-	-	-	-
13CrMo4-5 G17 CrMo 5-5	63	63	63	63	63	63	63	60,0	56,7	53,1	50,5	47,9	45,4	42,8	41,1	34,8	28,2	23,4	18,3	14,7
	100	100	100	100	100	100	100	95,2	90,0	84,2	80,2	76,1	72,0	68,0	65,2	55,2	44,7	37,1	29,0	23,3
	160	160	160	160	160	160	156	146	137	124	119	114	109	99	89	79	70	59	46	37



The system designer, building contractor and user are responsible for the correct selection of a strainer to the working conditions, its arrangement and assembly.

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

## 6. ASSEMBLY



Installations should be designed so as to prevent the negative effects of water hammer.

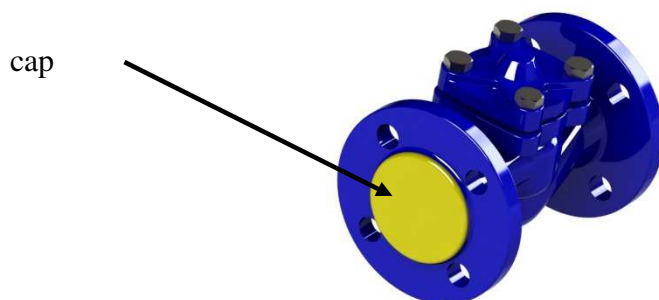
This can be achieved by:

- reduction of the maximum pressure to the value permissible for the materials of the valves.
- determination of the maximum pressure increase at the moment of water hammer and selection of appropriate DN diameter of the pipeline.

- use of pumps with high inertia of rotors and regulation of pump revolutions.
- use of overflow chambers and water-air tanks, airing valves or safety valves.

At the assembly of check valves, observe the following rules:

- evaluate before an assembly if the vent valves were not damaged during transport or storage, and make sure that applied valves are suitable for working conditions and the media in the system,
- take off the caps if the check valves are provided with them,



- check if the vent valve body is free of solid particles,
- steam pipelines should be lead in a way that prevents the accumulation of water;
- during e.g. welding, protect valves against splinters and used plastics against excessive temperature,



**Pipeline, on which valves are mounted, should be arranged and mounted so the valve body is not transmitting bending moments and is not extended.**

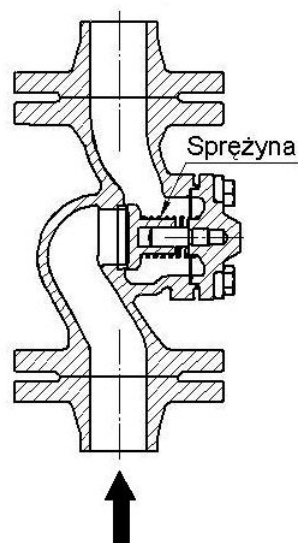
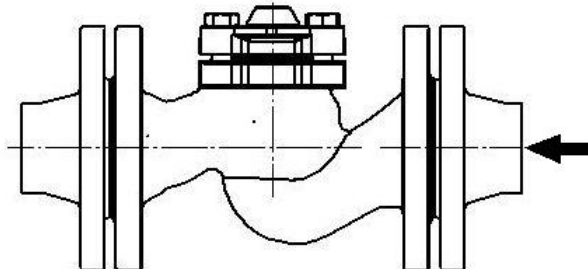
**Screw connections on the pipeline cannot introduce additional stress resulted from excessive tightening, and connection materials must be adapted to the operating parameters of the installation.**

- use compensators in order to reduce the impact of thermal expansion of pipelines,



**Install the valve so that flow direction comply with an arrow placed on the body.**

Check valves should be installed in horizontal pipelines cover up, and in vertical pipelines provided that the spring valve is used



- before starting the installation, especially after repairs, the system should be flushed

- installation of settling tank - strainer before the valve increases certainty of its correct functioning



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



**Valves made of 13CrMo4-5 stainless steel and operating at temperatures above 490°C due to material creep, cannot operate under these conditions for more than 100,000 hours.**

## 7. MAINTENANCE

During operation the following rules should be observed:

- process of starting up – commissioning should be conducted in a manner that eliminates the occurrence of sudden changes in temperature and pressure,
- valves work automatically and require no maintenance during operation



**To ensure the safe operation of each valve, especially of the ones that are rarely used, they should be regularly monitored. Inspection frequency should be determined by the user.**

## 8. SERVICE AND REPAIR



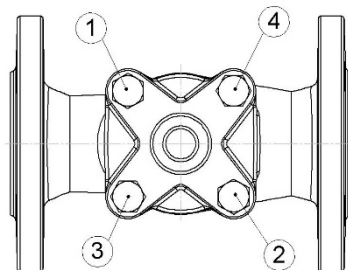
**Before taking up any service jobs make sure that the flow of medium in the pipeline was cut off, the pressure was reduced to ambient pressure, medium was removed and the plant was cooled down.**

- all service and repair jobs should be carried out by authorised staff using suitable tools and original spare parts.
- before disassembly of a complete valve from the pipeline or before service works, the particular part of the pipeline should be excluded from the operation
- during service and repair work personal health protection in pursuance of existing threat should be used,
- after valve disassembly it is necessary to replace flange connection gaskets between the valve and the pipeline,
- each time when the cover is removed, clean the valve sealing surface and apply new gasket of the same type as previously used



**Act with caution when touching seals located between the body and valve cover. A stainless steel strip located inside may cause injury.**

- bolts should be tighten and crosswise by torque wrench.



sequence of tightening  
the screws connecting  
the body with cover

- tightening torques of screws

screw	torque
M8	15-20 Nm
M10	35-40 Nm
M12	65 – 70 Nm
M16	140 -150 Nm
M20	150-200 Nm
M24	350-400 Nm

- before valve re-assembly in the pipeline it is necessary to check valve operation and tightness of all connections. Tightness test should be carried out with water pressure of 1,5 x nominal pressure of the valve.

## 9. REASONS OF OPERATING DISTURBANCES AND REMEDY

- When seeking of valve malfunction reasons safety rules should be strictly obeyed

Fault	Possible cause	Remedy
No flow	Flanges caps have not been removed	Remove the flanges caps
Low flow	Contaminated filter before the valve	Clean or replace the strainer
	Clogged pipeline system	Check the pipeline
Leakage on the seat	Damaged seat or plug	Replace the valve. Turn to the supplier or manufacturer
	Medium contaminated with solid objects	Clean the valve. Install the filter before the valve.
	Improperly mounted globe valve without spring	Install the valve properly or replace the valve spring
Noisy valve operation	Strong turbulent flow	Check again the project, make the necessary corrections, apply flow throttling
	Valve installed too close to the pump or after the elbow	
	No compensators or lack of straight sections for stabilization of the flow before and after the valve	
	Improperly chosen nominal diameter of the valve to the volume of flow	Select the appropriate diameter DN, apply flow throttling
Broken connecting flange	Bolts fastening flanges tighten unevenly	Replace the valve with new one



## **10. VALVE SERVICE DISCONTINUITY**

All obsolete and dismantled valves must not be disposed of with household waste. The valves are made of materials which can be re-used and should be delivered to designated recycling centres.

## **11. WARRANTY TERMS**

ZETKAMA grants quality warranty with assurance for proper operation of its products, providing that assembly of them is done according to the user manual and they are operated according to technical conditions and parameters described in ZETKAMA's catalogue cards. The warranty period is 18 months from assembly date, however not longer than 24 months from sales date.

Warranty claim does not cover assembly of foreign parts and design changes done by user as well as natural wear.

Immediately after detection, the user should inform ZETKAMA about hidden defects of the product.

A claim should be prepared in written form.

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