

## USER MANUAL

**CHECK VALVE**

**Fig. 297, 299**

**Edition: 1/2021  
Date: 12.01.2021**

### CONTENTS

1. Product description
2. Requirements for maintenance staff
3. Transport and storage
4. Function
5. Application
6. Assembly
7. Maintenance
8. Service and repair
9. Reasons of operating disturbances and remedy
10. Valve service discontinuity
11. Warranty terms

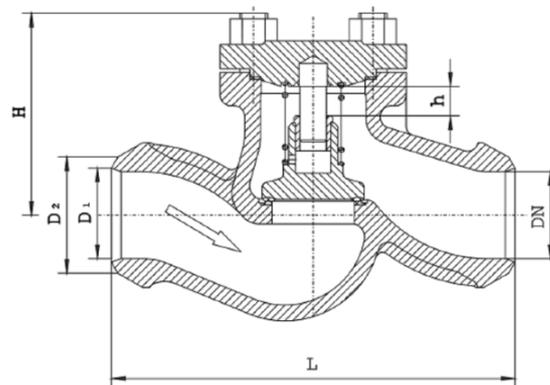
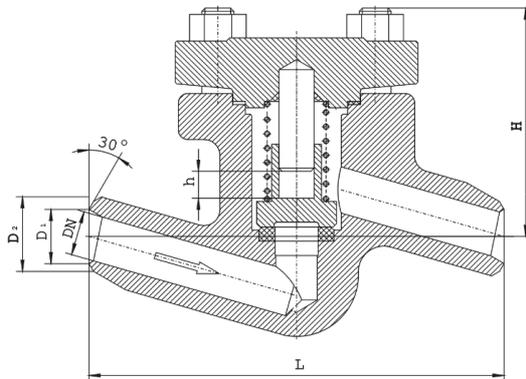


### 1. Product description

#### PN 40

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	X20Cr13	X20Cr13 DN 15-80 / P245GH DN 100-200 / P265GH DN250-300 (Seat 18-8 CrNi DN 100-300)	X6CrNiTi18-10	GX5CrNiMo19-11-2
4	Gasket	Graphite CrNi			
<b>Max. temperature</b>		<b>450°C</b>			<b>400°C</b>

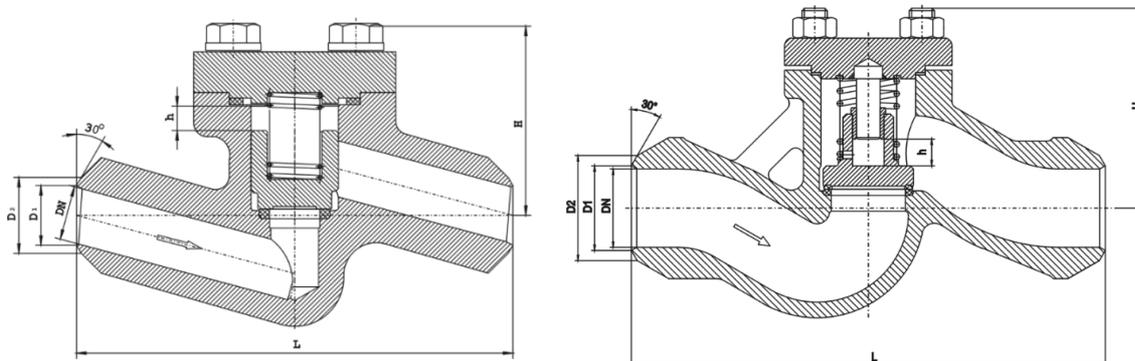
**PN 63-160**

DN 15-25 PN63, 100

DN 32-200 PN63, 100

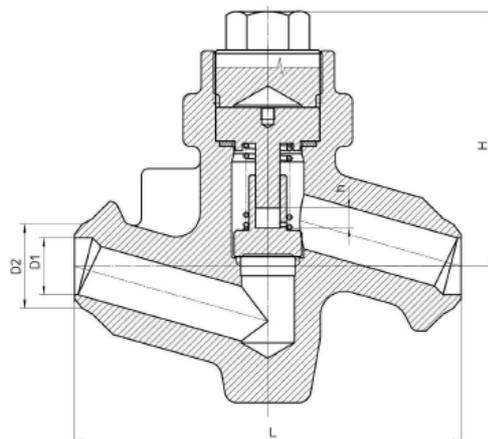
DN 15-50 PN160

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	13 Cr Mo 4 5	G17 CrMo 9- 10
2	Seat ring	18-8 Cr Ni	18-8 Cr Ni	Stellite	Stellite
3	Cover	P245 GH	P245 GH	13 Cr Mo 4 5	13 Cr Mo 4 5
5	Disc (padding)	18-8 Cr Ni		Stellite	
6	Gasket	Graphite			
<b>Max. temperature</b>		<b>450°C</b>		<b>550°C</b>	

**PN 250, 320, 500**



	Body material	G	Q			
	Type	31	31	31	31	31
1	Body	P245GH	16Mo3	13CrMo4-5	11CrMo9-10	X10CrMoVNb9-1
2	Seat ring	Stellit				
3	Cover	P245GH	13CrMo4-5	11CrMo9-10 DN 15-25 13CrMo4-5 DN 32- 50	13CrMo4-5	X10CrMoVNb9-1
5	Seat disc	Stellite				
6	Gasket	Graphite				
<b>Max. temperature</b>		<b>450°C</b>	<b>530°C</b>	<b>550°C</b>	<b>580°C</b>	<b>650°C</b>

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 - class D

## **2. REQUIREMENTS FOR MAINTENANCE STAFF**

The staff assigned to assembly, operating and maintaining tasks should be qualified to carry out such jobs.

If during strainer operation heat parts of the strainer, 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° to 65°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.

## **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.

Check valve Fig. 297 PN 40

	PN		-29÷ -10°C	-10÷ 50°C	100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C
<b>GP240GH</b> <b>P245GH</b>	<b>40</b>	bar	30	40	37,1	35,2	33,3	30,4	27,6	25,7	23,8	13,1
<b>X6CrNiTi18-10</b> <b>GX5CrNiMo19-11-2</b>	<b>40</b>	bar	30	40	40	36,3	33,7	31,8	29,7	28,5	27,4	-

Check valve Fig. 297 PN 63-160

		PN	-10°C ÷<50°C	100	150	200	250	300	350	400	450	460	470	480	490	500	510	520	530	540	550
<b>P245GH</b> <b>GP240 GH</b>	<b>63</b>	bar	63	58,5	55,5	52,5	48,0	43,5	40,5	37,5	20,7	-	-	-	-	-	-	-	-	-	-
	<b>100</b>		100	92,8	88,0	83,3	76,1	69,0	64,2	59,5	32,8	-	-	-	-	-	-	-	-	-	-
	<b>160</b>		160	137	130	124	113	103	97	91	47	-	-	-	-	-	-	-	-	-	-
		PN	-10°C ÷<50°C	100	150	200	250	300	350	400	450	460	470	480	490	500	510	520	530	540	550
<b>13CrMo4-5</b> <b>G17 CrMo</b> <b>5-5</b>	<b>63</b>	bar	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	
	<b>100</b>		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	
	<b>160</b>		160	160	160	160	156	146	137	124	119	114	109	99	89	79	70	59	46	37	

Check valve Fig. 299 PN 250, 320, 500

	PN		100°C	300°C	400°C	450°C	500°C	510°C	530°C	550°C		
P245GH	320	bar	320	308	216	132	---	---	---	---		
	500		500	400	320	235	---	---	---	---		
X30Cr13Mo4-5	320	bar	320	320	320	320	266	223	150	93		
	500		500	500	500	500	383	324	218	137		
16Mo3	320	bar	320	320	298	288	179	136	86	---		
	500		500	500	453	437	290	231	146	---		
		PN	450°C	500°C	510°C	530°C	550°C	580°C	600°C	620°C	640°C	650°C
11CrMo9-10	320	bar	320	286	250	188	138	88	-----	-----	---	---
	500		500	421	368	281	212	137	-----	-----	---	---
X10CrMoVNb9-1	500	bar	500	500	500	500	453	359	281	212	181	137



**The responsibility for correct selection of the valve to the medium, operating conditions, distribution and installation is borne by system designer, contractor and user.**

The valves are designed for applications independent of external conditions. Where there is a risk of erosion caused by external conditions (weather, aggressive vapours, gases, etc.), we recommend a special corrosion protection or the use of specially designed valves after discussion with the manufacturer.

## 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**

Welding of valves should be performed by suitably qualified persons in accordance with the recognized rules of technology.

The following rules must be observed during assembly of check valves:

- before assembly, determine whether the valves are not damaged during shipment or storage, and make sure that the used valves are suitable for operational parameters and media in the given plant,
- remove plugs if there are any in the flanged check valves,
- check that the inside of the valve is free from foreign bodies,
- steam lines must be routed in such a way as to prevent the accumulation of water,
- protect the valves during work, e.g. welding, against spatter, and the materials used against excessive temperature,
- depending on the installation, the minimum distance between the valve and other elements such as an elbow, diffuser, pump, other valves etc. must be kept. The valve should be placed at a distance of not less than 6 DN behind the flow disturbing element (elbow, pump, valves etc.). If the flow disturbing element is downstream of the valve, the distance between them should not be less than 2 DN.



**The pipeline to which the valves are mounted should be arranged and installed in such a way that the valve body does not transmit bending moments and is not stretched.**

- Use expansion joints to reduce the influence of thermal expansion of pipelines



**Install the valve so that the flow direction of the medium corresponds to the arrow placed on the body.**

- Disc check valves should be installed in horizontal pipelines with the bonnet up, and in vertical pipelines - provided that a valve with a spring is used
- Before starting the system, and in particular after repairs, flush the pipeline system
- Installing a strainer before the valve increases the certainty of its proper 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:

- commissioning process - commissioning should be conducted in a way that eliminates the occurrence of sudden changes of temperature and pressure,
- valves operate automatically and require no maintenance during operation.



**To ensure safe operation, each valve, especially one that is rarely used, should be regularly inspected. The frequency of inspection activities is determined by the user, however, the inspection shall not be less frequent than once a month.**

## 8. SERVICE AND REPAIR



**Before taking up any service jobs make sure that medium supply to the pipeline was cut off, pressure was decreased to ambient pressure, medium was removed from the pipeline and plant was cooled down.**

- All service and repair jobs should be carried out by authorized staff using suitable tools and original spare parts. Before disassembly of complete strainer from the pipeline or before service, the pipeline should be out of operation.
- Before removing the complete valve from the pipeline or before any maintenance works, the particular section of the pipeline

must be taken out of service.

- During service and repair jobs personal health protectives in pursuance of existing threat should be used.
- Each time after removing the valve bonnet, clean surfaces under gaskets and use new gaskets of the same type as the previously installed ones.



**Be careful when touching the gaskets located between the valve body and bonnet. The stainless steel strap inside them may cause cuts.**

- Bolts should be tightened evenly and crosswise with a torque wrench.
- Before reassembling the valves to the pipeline, it is necessary to check the valve function and the tightness of all connections. Tightness test should be performed with water pressure equal to 1.5 times 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

## 10. VALVE SERVICE DISCONTINUITY

All obsolete and dismantled valves must not be disposed with household waste. ZETKAMA 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 users manual and they are operated according to technical conditions and parameters described in ZETKAMA's catalogue cards. Warranty period is 18 months starting from assembly date, however not longer than 24 months from the 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.

Address for correspondence :

ZETKAMA Sp. z o.o.  
ul. 3 Maja 12  
57-410 Ścinawka Średnia  
Phone +48 74 86 52 111  
Fax +48 74 86 52 101  
Website: [www.zetkama.com](http://www.zetkama.com)