

CAST IRON GATE VALVE WITH THREADED END
DN25-50
PFA 16

GATE VALVE WITH THREADED END - TECHNICAL INSTRUCTION MANUAL				
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1. TECHNICAL DESCRIPTION

1.1. Product name and main features

This manual contains information concerning ductile cast iron gate valves with threaded end DN 25-50 with the following features:

- Smooth waterway construction with full port diameter waterway
- Rubber-covered wedge
- Not rising stem
- Internal stem thread
- Soft sealing of the stem in the bonnet

1.2. Intended use of a product

The gate valves as described in section 1.1 are designed to deliver chemically neutral clean consumption water, free from sand, gravel, metallic particles or other impurities. These gate valves can be installed into horizontal or vertical pipelines.

Table 1: Flow speed, pressure and temperature range of gate valves

DN	Allowable Operating Pressure PFA	Leak tightness test of the shell 1,5 x PFA	Seat tightness test 1,1 x PFA	Allowable temperature
	[bar]			°C
25÷50	16	25	17,6	0÷70

1.3. Construction and principle of operation (Fig.1, Tab.2)

The main parts of the gate valve with threaded end are shown on the fig.1.

Gate valve's outer shell consists of valve bonnet and body that are bolted together. The sealing is provided by a special profile gasket.

The internal parts there are: stem, resilient wedge and back seat. Closing of the gate valve proceeds by turning the stem in the clockwise direction.

Internal diameter of main waterway, called as the nominal diameter of valve and definite by "DN", is normalised. The face to face dimensions of valve body and threads are also normalised.

The oval outlet consists of a chamber that contains the rubber covered wedge, made of brass, that opens or closes the valve. The wedge is specially shaped to match the recess that divides the main waterway. The chamber on its sides has wedge guides that force and stabilise wedge's sliding motion.

Valve bonnet is of spherical shape with a tubular gland at the top. There is a brass bush in the gland that stabilises the stem's position and works as slide bearing. All mentioned elements are sealed by o-rings. The bush also contains a protective cap that protects the stem and other valve elements from dust and dirt.

The monolithic stem is made of stainless steel and has a thrust flange that stabilises the stem's longitudinal position. Section of the stem that is placed inside valve body under the thrust flange has a trapezoidal thread that mates with rubber - covered wedge.

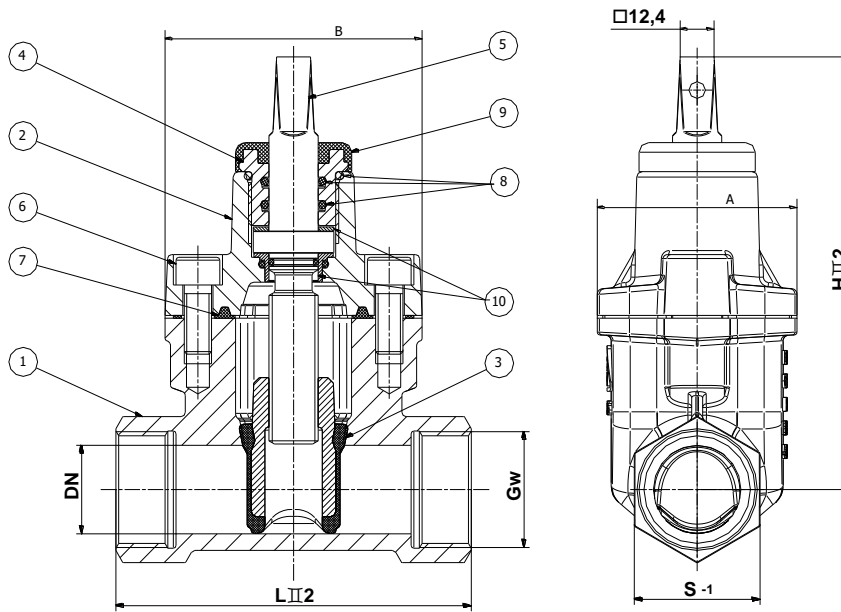


Fig. 1 – The construction of gate valve with threaded end

- 1 – valve body
- 2 – valve bonnet
- 3 – wedge
- 4 – threaded bush
- 5 – stem
- 6 – wrench-head bolts
- 7 – body/bonnet seal
- 8 – stem sealing
- 9 – protective cap
- 10 – back seat

Tab. 2 – Dimensions of gate valves with threaded end

DN	L (mm)	H (mm)	Gw (inch)	S (mm)	A (mm)	B (mm)	Weight (kg)
25	120	160	1	41	73	94	2,3
32	130	156,5	1 1/4	50	73	94	2,4
40	140	190	1 1/2	60	78	138	4,3
50	150	190	2	70	78	138	4,65

Tab. 3 – Number of turns to open/close the gate valve

DN	Tr – LH	Operating nut	Stem thread pitch	No of turns to open/close valve
		mm		1/n
25	18 x 4	12,4	35	8,75
32	18 x 4	12,4	35	8,75
40	18 x 4	12,4	46	11,5
50	18 x 4	12,4	54	13,5

Tab. 4 – Gate valve opening and closing torque

DN	Maximum closing torque (Nm)
25	48
32	48
40	48
50	48

1.4. Tightness class

The gate valves as described herein (the pressure range from the Tab. 1 and at room temperature 20°C) have been categorised as class A devices according to EN-12266-1.

1.5. Materials

- Valve body, valve bonnet - ductile cast iron
- Stem - stainless steel
- Threaded bush, wedge casting
Sliding rings - brass
- Wedge lining, o-rings,
body/bonnet seal - rubber
- Bolted parts - galvanised carbon steel or stainless steel
on the request
- Protective coating - Furnace-hardened epoxy powder paint

The materials grades are given in the component list and design documentation.

1.6 Technical verification and approval

Hygienic certificate PZH no. HK/W/0587/01/2012

1.7 Applicable norms and regulation

- PN-EN 1074-1 - Valves for water supply. Fitness for purpose requirements and appropriate verification tests –Part 1: General requirements
- PN-EN 1074-2 - Valves for water supply. Fitness for purpose requirements and appropriate verification tests –Part 2: Isolating valves.
- PN-EN 1563 - Founding. Spheroidal graphite cast irons.
- PN-EN ISO 228-1 - Pipe threads where pressure-tight joints are not made on the threads Part 1: Dimensions, tolerances and designation.
- EN 12266-1 - Industrial valves. Testing of valves. Part 1: Mandatory requirements.
- EN 12266-2 - Industrial valves. Testing of valves. Part 2: Supplementary requirements
- PN-EN 681-1 - Elastomeric seals – Material requirements for pipe Joints seals used in water and drainage applications – Part 1: Vulcanized rubber
- PN-EN 10226-1 - Pipe threads where pressure-tight joints are made on the threads Part 1 Taper external threads and parallel internal threads - Dimensions, tolerances and designation

2. DESIGN VARIATIONS

In order to meet the market requirements, the gate valves with threaded end are manufactured in several variations.

Basic design, intended use, compliance with requirements remain unchanged for all variations.

- The gate valves with threaded end type UG-2Gw – with two internal threads (fig.1)
- The gate valves with threaded end type UG-Gw/Gz – with one internal and one external thread.

The dimensions of internal and external threads for the gate valves Gw/Gz are shown in the tab.5

Tab. 5 Thread dimensions for valves Gw / Gz according to PN-EN 10226-1
(the thread is allowed to perform in accordance with EN ISO 228-1, for external threads the tolerance is A after settling it with the client)

DN	Gz (inch)	Gw (inch)
25	G1A	G1
32	G1 ¼ A	G1 ¼
40	G1 1 ½ A	G1 ½
50	G2 A	G 2

3 ASSEMBLY AND OPERATION

3.1. Transport and storage

The gate valve is delivered in open position. The gate valve is packed in a plastic bag and placed in cardboard box. Transport should be done in a manner that does not present a risk of permanent damage to external or internal protective coating. Valves should be stored in rooms, which are free from mechanical, chemical and bacteriological impurities.

3.2. Assembly in pipeline

Gate valves described herein can be installed in horizontal or vertical pipelines. Gate valves shall be installed in such a way that they are not subjected to shearing forces in the pipeline. Pipeline designer should indicate a proper installation configuration.

Note: Any impurities, dirt or sharp particles on any gate valve's parts may cause loss of tightness or irreversible damage to sealing surfaces.

During priming, gate valve must be fully open.

3.3 Operation and maintenance

Gate valves described herein do not require any special operation and maintenance. Worn out o-rings in valve gland can be replaced under pressure without the necessity to cut off water supply. In order to replace the o-rings, the following steps must be taken:

1. fully open the gate valve
2. remove the threaded bush
3. replace the o-rings
4. verify the condition of upper thrust washers and replace, if necessary
5. coat the bush thread with protective emulsion
6. screw the bush in until resistance is felt

If there is loss of tightness around the valve wedge the following steps must be taken:

- cut off water supply
- fully open the gate valve
- withdraw the internal unit and inspect all sealing surfaces
- if there is damage to valve wedge it must be replaced
- if there is damage to wedge recess in valve body, it must be replaced
- re-assemble the valve (in reverse order, with the principles as during priming)

Note: The manufacturer shall not be liable for damage to gate valves caused by improper transport, handling, installation or operation in violation of recommendations and procedures contained herein.

Table 8 – O-ring and T- key dimensions for use with gate valves

DN	„O” ring		T-key S; of bush M 33x2(mm)
	D x d (mm)	pcs	
25 - 50	18,2 x 3	2	32
	21,3 x 3	1	
	29,3 x 3	1	
	14 x 2	1	

3.4 PROCEEDING DURING REMOVE GATE VALVE

Never it was found that any part of gate valve produced by METALPOL WĘGIERSKA GÓRKA, has a negative influence for environment, people and animals. This fact is confirmed by Hygienic Certificate issued by PZH in Warsaw. None of the parts of gate valve in chemical analysis holds substances from the list of Substances of Very High Concern (SVHC). In case of remove the gate valve, each part of gate valve is subjected to recycling and as a raw material it may be using in the other manufacturing process.

Please note that sediment gathered inside the valve or the pipeline may be dangerous to man or to the environment. Therefore adequate safety requirements must be applied. At the end of lifecycle the valve must be disposed in accordance to adequate environmental safety regulations.

4. MANUFACTURE’S GUARANTEE

The guarantee covers the products installed and used according to the rules indicated in this Document.

Detailed provisions of manufacturer’s guarantee are available in manufacturer’s ‘Guarantee conditions’ constituting attachment to pricelist

Tampering with products (changes, replacement of parts, loosening original connections, etc. without the consent of the Producer) is not permitted and causes the expiration of the guarantee obligations and product liability.