

Operation and maintenance
manual for

KNIFE
GATE VALVES

P/N
2004

Approved for use by

President of Factory, JAFAR S.A.

Failure to comply with the guidelines and instructions in this Operation and Maintenance Manual releases the manufacturer from all obligations, liability and guarantee.

Due to continuous business development, we reserve the right to introduce modifications and structural changes to the presented product.

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1 TECHNICAL DESCRIPTION

1.1 PRODUCT DESIGNATION AND IDENTIFICATION

The subject of this Operation and Maintenance Manual is:

Type 2004 one-way flange-to-flange knife gate valve

- full bore design
- stainless steel knife (closer)
- available with rising (standard) spindle or non-rising spindle
- soft gland seal of the closer and the body

1.2 USE

The Type 2004 one-way flange-to-flange knife gate valves are intended for water supply systems, and especially sewage systems, and industrial processing systems. The valves can be operated both in underground and overground installations as installed in vertical or horizontal pipelines.

1.3 TECHNICAL SPECIFICATION

The flange-to-flange knife gate valves are intended for transfer of potable water, process water and sewage, as well as other liquids as approved by the manufacturer.

- Temperature: 0°C to +70°C
- Nominal diameter (dimension) range: DN50 to DN700 [mm]
- Maximum medium flow rate:
 - liquid: max. 4 [m/s]
 - gas: max. 30 [m/s]
- The driving torque at opening start and closing end is as listed below:

DN [mm]	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700
Mmax [Nm]	20	25	30	30	50	60	70	80	90	105	120	160	180	210	250

- Valve control mode: the standard version of gate valve has the clockwise closing sense of rotation.
The closing sense of rotation can be opposite on special order.
- The knife valves are designed for installation between flange end faces
acc. to PN-EN 1092-2: 1999 with bolt holes for the pressure rating of PN10.
- Installation length: per the technical file, see Table 2 for sizes.
- Nominal pressure PN values: - per size:

DN50 to DN250	-	-1.0 MPa
DN300 to DN450	-	-0.7 MPa
DN500 to DN600	-	-0.4 MPa
DN700	-	-0.2 MPa

2 DESIGN

2.1 DESCRIPTION OF THE VALVE DESIGN

The Type 2004 one-way flange-to-flange knife gate valves supplied by **F.A. „JAFAR”S.A.** feature a full bore body, a stationary spindle (in the standard version) and an L-gasket closure seal embedded in a metal enclosure. The body seal of the knife is a multi-layered packing compressed by a gland with bolts. The gland on the delivered valve is loose and must be tightened before installation. The knife gate valve body is a monolithic panel design. The gate knife clears the body by turning the hand wheel which drives the outer spindle held by a nut. The one-way design means that the flow may only be admitted from one direction only, as marked with the

arrow symbol on the valve body. Above the hand wheel is the spindle shielding tube which protects the spindle from contamination and damage. The valve body top and bottom sections feature tapped holes for installation between the flanged ends. Table 3 shows the bolt sizing for flange ends (PN10 bolt hole layout).

2.2 MATERIALS

Table 1 lists the structural materials of the flange-to-flange knife gate valves.

Item	Part designation	Material	Reference standard
1	Body	Cast-iron, EN-GJL-250 Cast-iron, EN-GJS-400-15 Steel grade 1.4301	PN-EN 1561: 2012 PN-EN 1563: 2012 PN-EN 10088-1: 2014
2	Seal	Package: Asbestos-free sealant + NBR	PN-ISO 1629:2005
3	Knife	Steel grade 1.4301	PN-EN 10088-1: 2014
4	Spindle	Steel grade 1.4021	PN-EN 10088-1: 2014
5	Stem	Steel grade 1.0038	PN-EN 10025: 2007
6	Nut holder	Steel grade 1.0038	PN-EN 10025: 2007
7	Washer	Bronze	PN-EN 1982: 2010
8	Spindle nut	Brass	PN-EN 1982: 2010
9	Set screw		PN-EN ISO 4027: 2006
10	Grease nipple		PN-76/M-86002
11	Cap	Polypropylene	PN-EN ISO1873-1:2000
12	Shielding tube	Steel, R45	PN-89/H-84023.07
13	Handwheel	Cast-iron, EN-GJL-250	PN-EN 1561: 2012
14	Pressure plate	Silumin, AlSi	PN-EN 1706:2011
15-17	Gasket	Rubber: NBR	PN-ISO 1629: 2005
16	Safety ring	Steel grade 1.4301	PN-EN 10088-1: 2014

2.3 DIMENSIONS

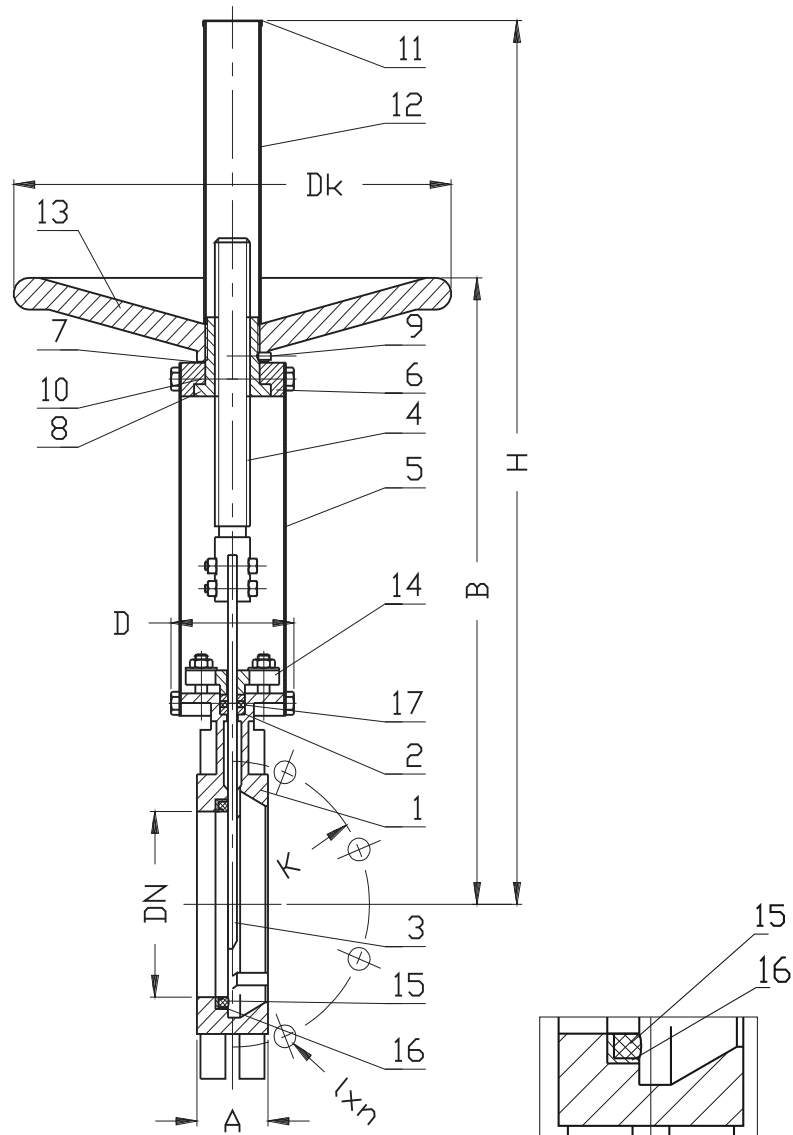


Table 2

DN	PN	PS	Type of thread	No. of turns	K	l x n	A	B	D	H	Dk	Mass
[mm]	[bar]		[mm]	[n]	[mm]							[kg]
50	10	16	Tr 20x4 LH	14	125	19x4	40	283	83	348	200	8
65				17	145			308		388		10
80				21	160			333		413		11
100				26	180	19x8	50	378		488		12
125				32	210			423	93	564	250	17
150				39	240	23x8	60	474		635		21
200	10	7	Tr 25x5 LH	41	295			593	108	809	310	38
250				51	350	23x12	70	685		946		52
300				61	400			792		1118		63
350		7	Tr 35x6 LH	59	460	23x16	96	900	290	1282	500	115
400				68	515	28x16	100	978		1441		145
450				76	565	28x20	106	1105		1587		186
500				84	620	28x20	110	1215		1809		221
600		102		725	31x20	1418		2060	265			
700		2		Tr 50x8 LH	103	840		31x24	1640	400	2372	800

2.4 REFERENCE STANDARDS

PN-EN 1074-1: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. General requirements
PN-EN 1074-2: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Isolating valves.
PN-89/H-02650	Valves and pipelines. Pressure and temperature ratings.
PN-EN 1092-2: 1999	Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges.
PN-EN19: 2005	Industrial valves. Marking of metallic valves
PN-EN 12266-1: 2012	Industrial valves. Testing of metallic valves. Pressure tests, test procedures and acceptance criteria. Mandatory requirements.
PN-EN ISO 6708: 1998	Pipework components. Definition and selection of DN (nominal size).
PN-EN 1559-1: 2011	Founding. Technical conditions of delivery. General.
PN-EN 1561: 2012	Founding. Grey cast irons.
PN-EN 1563: 2012	Founding. Spheroidal graphite cast irons.
PN-EN 1370: 2012	Founding. Surface roughness inspection by visual tactile comparators.
PN-EN 10088-1: 2014	Stainless steels. List of stainless steels.
PN-89/H-84023.05	Specific application steel. Improved quality low-carbon, low-alloy and alloy steels. Grades.
PN-EN 1982: 2010	Copper and copper alloys. Ingots and castings.
PN-EN 12420: 2002	Copper and copper alloys. Forgings.
PN-EN 1706: 2011	Aluminium and aluminium alloys. Castings. Chemical composition and mechanical properties.
PN-ISO 965-1: 2001	General purpose ISO metric threads. Tolerances. Principles and basic data.
PN-ISO 2903: 1996	Trapezoid ISO metric threads. Tolerances.
PN-EN ISO 4017: 2011	Hexagon head screws. Product grades A and B.
PN-EN ISO 4027: 2006	Hexagon socket set screws with cone point.
PN-ISO 1629: 2005	Rubbers and latices. Nomenclature.
PN-EN ISO 1873-1: 2000	Plastics. Polypropylene (PP) moulding and extrusion materials. Designation system and basis for specifications.
PN-EN ISO 12944-5: 2009	Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Protective painting systems.

5 ORDERING INFORMATION

Water supply system fittings are specific purpose industrial fittings, therefore orders must include:

- part number (P/N, equal to the product type);
- intended use, e.g. for water supply systems,
- and:
 - nominal diameter, acc. to PN-EN ISO 6708: 1998
 - nominal pressure, acc. to PN-89/H-02650;
 - type of body material — acc. to PN-EN 1561: 2012, PN-EN 1563: 2012
or PN-EN 10088-1: 2014
- maximum operating temperature, acc. to PN-89/H-02650.

2.6 PRODUCTION AND ACCEPTANCE

The TYPE 2004 one-way flange-to-flange knife gate valves are accepted and manufactured in accordance with: PN-EN 1074-2: 2002 (Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Isolating valves) and PN-EN 12266-1: 2012 (Industrial valves. Testing of metallic valves. Pressure tests, test procedures and acceptance criteria. Mandatory requirements). All gate valves are leak tested (100%). The tests include external body tightness and closing tightness.

2.7 MARKINGS

The valve marking is regulated by the following standards: PN-EN-19: 2005, PN-EN-1074-1: 2002.

The valve bodies feature markings on the front and back walls of the body chamber. The marking contains the following data:

- valve type (defined by the product reference standard number)
- nominal diameter
- nominal pressure
- body material type
- manufacturer trademark

The location on the valve specified in the documentation features the nameplate which contains the following data:

- manufacturer's company name and logo
- serial number
- sealing temperature rating
- construction mark "B" and/or mark "CE" (as applicable)
- product type.

3 PROTECTION, STORAGE & TRANSPORT

3.1 PROTECTIVE COATINGS

All inner and outer cast-iron and steel surfaces are protected with electro-deposited epoxy coat. The coat has been approved for contact with foodstuffs.

The anti-corrosion coating layer minimum thickness is 250µm.

The casting surface is pre-treated for epoxy coating in accordance with the relevant technical documentation and PN-EN ISO 12944-5: 2009.

The stem to body and to nut mount fastening bolts are made of galvanized steel (Fe/Zn5).

3.2 PACKAGING

The knife gate valves are packed on EURO pallets (1200x800) and protected with heat-shrunk film.

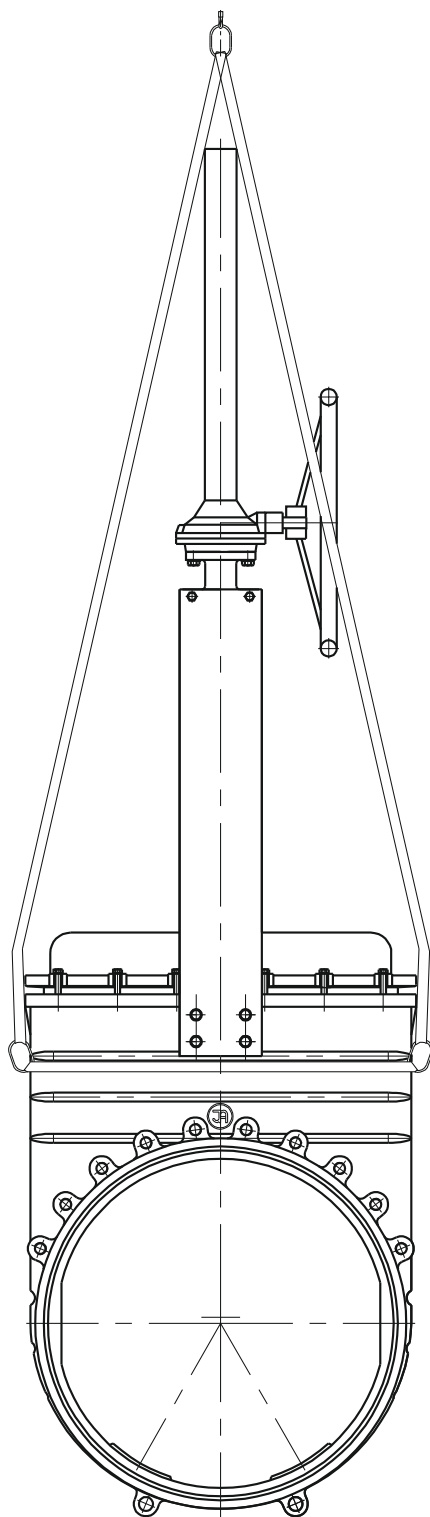
3.3 STORAGE

Store the knife gate valves in sheltered rooms.

3.4 TRANSPORT

Transport the knife gate valves on sheltered vehicles.

Heavy gate valves (DN25 and larger) shall be handled on slings (see the example diagram below) and secured from turning.



4 ASSEMBLY AND INSTALLATION

4.1 ASSEMBLY GUIDELINES

The Type 2004 flange-to-flange knife gate valves can be installed in underground or overground pipelines both in horizontal or vertical orientation. The knife gate valves are designed for mounting between flange ends of the pipelines sized for the PN10 bolt hole layout acc. to PN-EN 1092-2: 1999. The gland on the delivered valve is loose and must be tightened before installation. Note that the system must not expose the (gate) valve to bending or tensile stress from loading with the weight of unsupported pipeline sections. Assemble with consideration to pressure and temperature compensation of the pipeline. The valve assembled and adjusted by the manufacturer is ready for installation. Any dismantling of the valve components may result in loss of seal.

4.2 ASSEMBLY INSTRUCTIONS

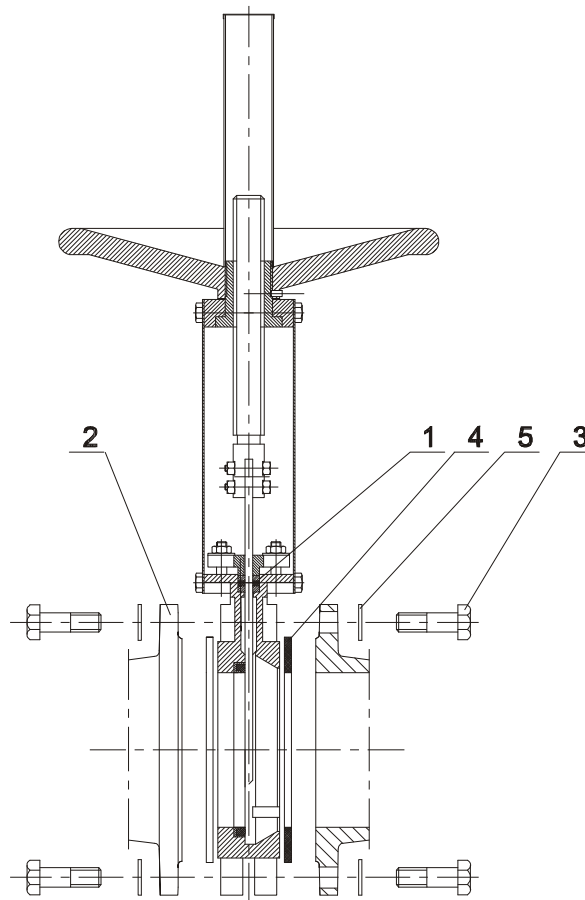
Before attempting to install the valve, check the technical and commercial documents delivered with the product to verify that the media and pipeline operating parameters comply with the manufacturer's declaration. Any change in the operating conditions must be consulted with the valve manufacturer beforehand.

Before attempting to assemble the valve, remove the main bore plugs, check the inner surfaces of the valve and thoroughly flush with water, if necessary.

Lubricate the spindle nut via the grease nipple in the nut holder and keep the nut clean. Thread the plugged shielding tube over the threaded tip of the spindle nut above the hand wheel. Fill the shielding tube with a little of grease to make the regreasing reserve.

CAUTION! If the product is damaged mechanically, do not install it in the pipeline.

The installation and design of the gate valve is shown in the following figure:



1. - Knife gate; 2. - Pipeline flange end; 3. - Assembly bolt; 4. - Seal; 5. - Nut; 6. - Washer

Use of bolts for the knife gate valve P/N 2004.

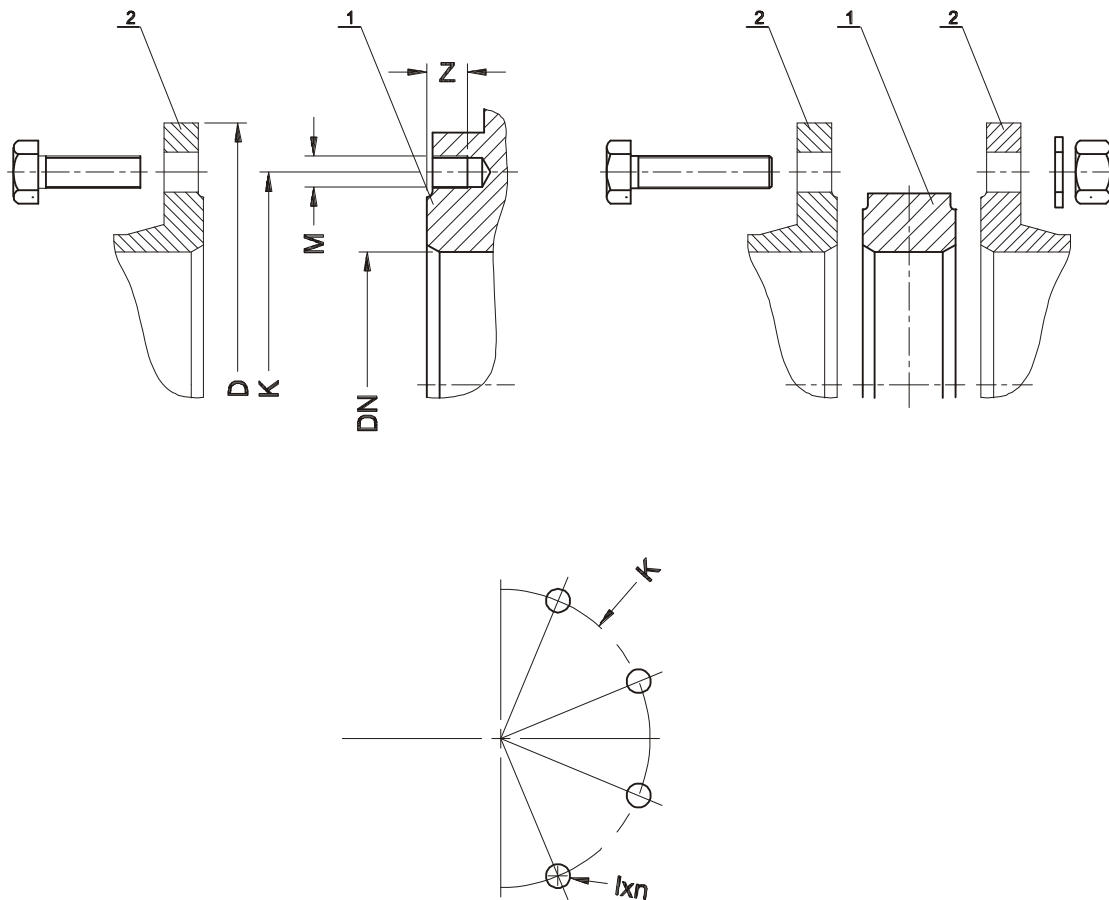


Table 3

DN [mm]	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700
D [mm]	165	185	200	220	250	285	340	395	445	505	565	615	670	780	895
K [mm]	125	145	160	180	210	240	295	350	400	460	515	565	620	725	840
Lxn	4x1 8	4x1 8	8x1 8	8x1 8	8x1 8	8x2 2	8x2 2	12x 22	12x 22	16x 22	16x 22	20x 26	20x 26	20x 30	24x 30
Thread-in bolts (1 x M x length)	8 M1 6x2 5	8 M1 6x2 5	8 M1 6x3 0	8 M1 6x3 0	8 M16 x30	8 M2 0x3 5	8 M2 0x3 5	16 M2 0x4 0	16 M20 x40	20 M20 x45	20 M24 x50	28 M2 4x5 5	28 M2 4x5 5	28 M2 7x5 5	32 M27
Z [mm]	8	8	9	9	9	10	12	12	12	19	20	24	24	24	-
Bolts with nuts (1 x M x length)	-	-	4 M1 6x1 20	4 M1 6x1 20	4 M16 x12 0	4 M2 0x1 30	4 M2 0x1 40	4 M2 0x1 50	4 M20 x15 0	6 M20 x18 0	6 M24 x19 0	6 M2 4x2 00	6 M2 4x2 00	6 M2 7x2 00	8 M27 x21 0

4.3 OPERATION

The knife gate valve shall be operated according to all relevant requirements for cut-off valves, i.e. either in fully open or fully closed positions. Leaving the gate valve partially opened (or closed) may result in seal failure. To ensure full performance, switch the knife gate valve periodically (once a year, from fully open to fully closed).

Exceeding the operating limits of the valve may result in damage that will not be covered by the suretyship granted by the manufacturer.

4.4 OCCUPATIONAL HEALTH AND SAFETY

The knife gate valves are eligible for the OHS guidelines and recommendation concerning installation of pipelines and devices for water supply stations, heat power plants, water treatment plants, sewage treatment plants, pumping stations and other facilities, and eligible for the Polish Regulation concerning general OHS laws (use of personal protective equipment for hands, legs and head, and safety garment), especially at work with low or high temperature hazard.

Misuse of this product is prohibited.

5 WARRANTY TERMS AND CONDITIONS

The product assembled, installed and operated in compliance with this Manual is covered by a commercial warranty from the manufacturer. The warranty terms, conditions and period are specified in the relevant Warranty Sheet.