Operation
and Maintenance Manual

FLANGE-TO-FLANGE
GATE VALVES
WITH SOFT SEALS
AND PNEUMATIC ACTUATORS

P/N
2901
2903

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 warranty.

Due to the continuous development of the company, we reserve the right to modifications and design changes in the product presented herein.

CONTENTS

1 TECHNICAL DESCRIPTION

1.1 PRODUCT DESIGNATION AND IDENTIFICATION

The subject of this Operation and Maintenance Manual is**:**
Type 2901 and 2903 flange-to-flange wedge gate valves with soft seals and a pneumatic linear actuator.

- full smooth walled bore design
- wedge (closure) embedded in 100% pure elastomer
- rising spindle
- spindle head-type seal in valve cover (O-rings)

1.2 USE

The Type 2901 and 2903 cast iron flange-to-flange wedge gate valves with soft seals are intended for water supply systems, especially for potable water, sewage systems, and industrial processing systems. The valves are intended for overground and underground (vaulted) systems and must be installed in horizontal pipelines.

1.3 TECHNICAL CHARACTERISTICS

The Type 2901 and 2903 flange-to-flange wedge gate valves with soft seals and a pneumatic linear actuator are applied in transfer of potable water, process water and other liquids as approved by the manufacturer.

- Operating temperature range: +70°C max.
- Nominal diameter (dimension) range: DN40 to DN400 [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]	40	50	65	80	100	125	150	200	250	300	350	400
Mmax [Nm]	25		50			100			200		250	280

- Valve control mode: pneumatic actuator.
- The valve connection flange design is acc. to PN-EN 1092-2: 1999 with the sizes compliant with the nominal pressure values.
- Special flanged connection for the pneumatic actuator.
- Installation length: PN-EN 558-1: 2012 series 14 - Type 2901
  series 15 - Type 2903
- Nominal pressure ratings (PN): - 0.6 MPa
  - 1.0 MPa
  - 1.6 MPa

2 DESIGN

2.1 DESCRIPTION OF THE VALVE DESIGN

Type 2901 and 2903 flange-to-flange wedge gate valves with soft seals and a pneumatic linear actuator manufactured by **F.A. „JAFAR" S.A.** feature a smooth walled bore, a rising spindle, and an o-ring spindle seal installed in a head-type valve cover. The spindle is guided by a bushing in the valve cover neck and a sealing plug. The spindle seal is effected by the plug sealing assembly, which is a system of O-rings. The gate valve closure is a cast iron wedge completely coated with rubber and featuring a spindle nut located on the wedge lug and linked with the pneumatic actuator piston. The top part of the sealing plug is secured against loosening with a wire spring ring. The valve cover to body joints is made with hex cap screws mounted flush with the valve cover and preserved with a paraffin compound.

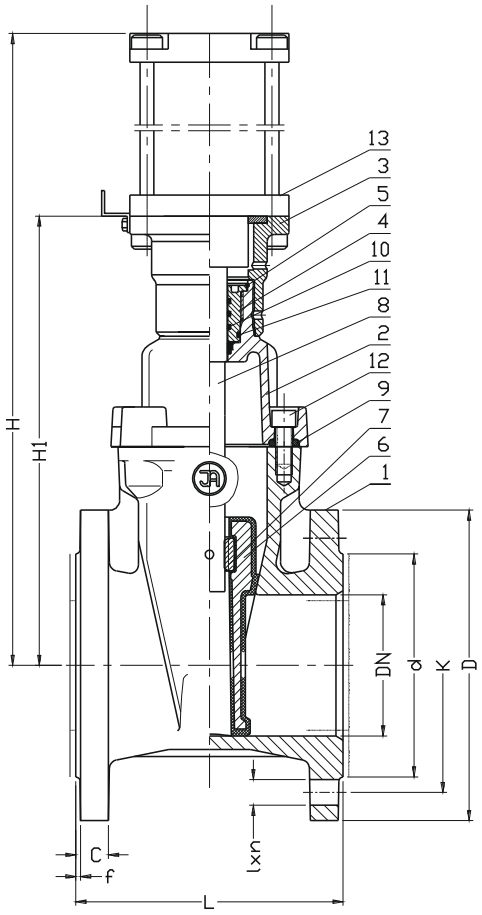
The valve cover to body seal is a rubber gasket which also seals the bolt penetration points to prevent any leaks from their leads. All inner and outer cast-iron surfaces of the valve are epoxy powder coated. The gate valves from DN350 to DN400 feature a wedge guide system made of plastic inserts.

2.2 MATERIALS

The table below lists the structural materials of the gate valves with soft seals.

Item	Part designation	Material	Reference standard
1	Body	Cast iron, EN-GJS-400-15 or EN-GJS-500-7	PN-EN 1563: 2012
2	Cover	Cast iron, EN-GJS-400-15 or EN-GJS-500-7	PN-EN 1563: 2012
3	Link	Cast iron, EN-GJS-400-15 or EN-GJS-500-7	PN-EN 1563: 2012
4	Sealing plug	Brass	PN-EN 1982: 2010
5	Safety ring	Steel grade 1.1260	PN-74/H-84032
6	Wedge	Cast iron, EN-GJS-400-15 or EN-GJS-500-7 EPDM/NBR	PN-EN 1563: 2012 PN-EN 1563: 2012 PN-ISO 1629: 2005
7	Spindle nut	Brass or EN-GJS-400-15	PN-EN 1982: 2010 PN-EN 1563: 2012
8	Spindle	Steel grade 1.4021	PN-EN 10088-1: 2014
9	Valve cover gasket	EPDM/NBR	PN-ISO 1629: 2005
10 11	O-ring	EPDM/NBR	PN-ISO 1629: 2005
12	Bolt	Steel, Fe/Zn5, stainless steel	PN-EN ISO 4762: 2006
13	Pneumatic actuator	Manufacturer's catalogue	

2.3 DIMENSIONS



DN	2901 L	2903 L	H1	H	d	D	K PN16 (PN10)	l PN16 (PN10)	C	f	n PN16 (PN10)	Actuator type
[mm]											-	-
40	140	240	219	417	84	150	110	19	19	3	4	18.2696.0060AK
50	150	250	229	437	99	165	125	19	19	3	4	18.2696.0070AK
65	170	270	257	475	118	185	145	19	19	3	4	18.2696.0080AK
80	180	280	282	520	132	200	160	19	19	3	8	18.2696.0100.AK
100	190	300	319	599	156	220	180	19	19	3	8	18.2680.0120.AK
125	200	325	358	658	184	250	210	19	19	3	8	18.2680.0140.AK
150	210	350	434	784	211	285	240	23	19	3	8	18.2681.0170.AK
200	230	400	509	909	266	340	295	23	20	3	12 (8)	18.2681.0220.AK
250	250	450	603	1053	319	405	355 (350)	28 (23)	22	3	12	18.2719.0270.AK
300	270	500	678	1178	370	460	410 (400)	28 (23)	25	4	12	18.2719.0320.AK
350	290	550	827	1437	429	520	470 (460)	28 (23)	27	4	16	18.2724.0400.AK
400	310	600	1060	1730	480	580	525 (515)	31 (28)	28	4	16	18.2724.0450.AK

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 558: 2012	Industrial valves. Face-to-face length in metal straight and angle fittings for flange pipelines. Fittings with PN and class markings.
PN-EN ISO 5210: 2011	Industrial valves. Multi-turn valve actuator attachments.
PN-EN ISO 6708: 1998	Pipework components. Definition and selection of DN (nominal size).
PN-EN 1559-1: 2011	Foundry. Technical conditions for delivery. Delivery specifications.
PN-EN 1561: 2012	Founding. Grey cast irons.
PN-EN 1563: 2012	Founding. Spheroidal graphite cast irons.
PN-EN 1370: 2012	Foundry. Surface roughness testing using visual and tactile reference.
PN-EN 10088-1: 2014	Stainless steels. List of stainless steels.
PN-74/H-84032	Spring steel. Grades.
PN-EN 1982: 2010	Copper and copper alloys. Ingots and castings.
PN-EN 12420: 2002	Copper and copper alloys. Forgings.
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 4762: 2006	Hexagon socket head cap screws.
PN-EN 10204: 2006	Metal products. Types of control documents.
PN-ISO 1629: 2005	Rubbers and latices. Nomenclature.
PN-EN ISO 1873-1: 2000	Plastics. Polypropylene (PP) injection and extrusion moulding materials. Marking system and basis for classification.
PN-EN ISO 1874-1: 2010	Plastics. Polyamide (PA) moulding and extrusion materials. Marking and basis for classification.
PN-EN ISO 12944-5: 2009	Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Protective paint systems.

2.5 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 or PN-EN 1563: 2012
- maximum operating temperature, acc. to PN-89/H-02650.

2.6 PRODUCTION AND ACCEPTANCE

Type 2901 and 2903 gate valves with soft seals are accepted and produced in accordance with PN-EN 1074-2: 2002 (Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Stop fittings) and PN-EN 12266-1: 2012 (Industrial valves. Testing of valves). All gate valves are leak tested (100%). The tests include external body tightness and closing tightness.

2.7 MARKING

The gate valve marking meets 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 grade
- the Polish Building Mark "B" and/or the CE mark (as applicable)
- product type

3 PROTECTION, STORAGE & TRANSPORT

3.1 PROTECTIVE COATINGS

All inner and outer cast-iron 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 250 μm. The casting surface is pre-treated for epoxy coating in accordance with the relevant technical documentation and PN-EN ISO 12944-5:2009. The cover-to-body fastening bolts are grade OH18N9 or Fe/Zn5 (galvanised steel).

3.2 PACKAGING

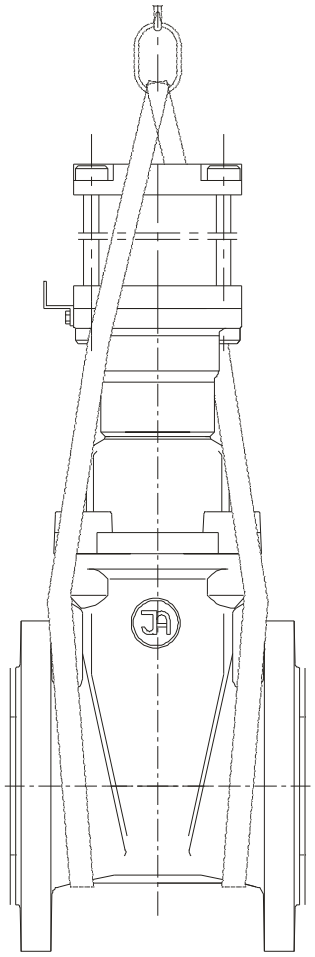
The gate valves are packed on EURO pallets (1200x800) and protected with heat-shrunk film.

3.3 STORAGE

Store the gate valves in sheltered rooms.

3.4 TRANSPORT

Transport the gate valves on sheltered vehicles. Heavy gate valves (DN350 and larger) shall be handled with the integrated handling pieces made of eye bolts; the gate valves from DN40 to DN300 shall be handled on slings. Never suspend the valve by its pneumatic actuator when handling.



4 ASSEMBLY AND INSTALLATION

4.1 ASSEMBLY GUIDELINES

Type 2901 and 2903 flange-to-flange wedge gate valves with soft seals and a pneumatic linear actuator can be installed in underground or overground pipelines both in horizontal or vertical orientation. The listed products are suitable for joining with the flanged ends of pipelines with the size equal to that of the valve flanges. Note that the system must not expose the valve to bending or tensile stress from loading with the unsupported pipeline sections.

It is recommended to perform installation works considering pipeline compensation due to temperature and pressure. The valve assembled and adjusted by the manufacturer is ready for installation. Any dismantling of the valve components may result in loss of seal. When installing the gate valve with its actuator, follow the OHS requirements specified in the actuator operation and maintenance manuals.

4.2 ASSEMBLY INSTRUCTIONS

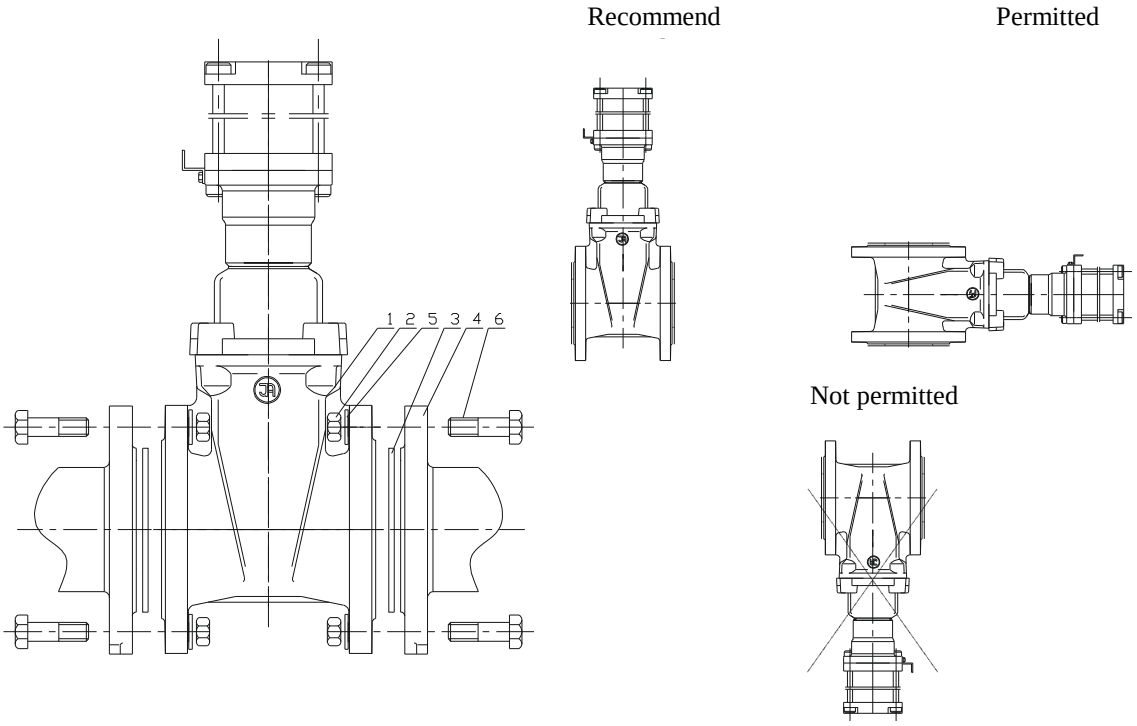
Before attempting to install the valve, check the technical and commercial documents delivered with the product to verify that the media and pipeline operating parameters comply with the manufacturer's declaration. Any change in the operating conditions must be consulted with the valve manufacturer beforehand.

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.

CAUTION! If mechanical damage is found on the product, do not install it in the pipeline.

Before commissioning the gate valve equipped with an actuator, check during the connection and adjustment of the actuator that the joints of the air supply system and electrocution protection features have been installed according to the manual from the actuator manufacturer.

The figure below shows the method for coupling the gate valve with its pneumatic actuator and the valve orientation diagrams:



1. Valve; 2. Nut; 3. Gasket; 4. Pipeline flange; 5. Washer; 6. Fastening bolt

4.3 OPERATION

The 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 knife 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 covered by the suretyship granted by the manufacturer.

4.4 GENERAL

This Manual applies to all Group 2000 products designed for equipping with actuators (i.e. gate valves of various connection end types) and manufactured by FA. JAFAR S.A.:

- Cast iron flange-to-flange wedge gate valves with soft seals
- Gate valves with soft seals with threaded connection ends
- Gate valves with soft seals and ferrule connection ends
- Cast iron flange-to-flange wedge gate valves with soft seals for natural gas systems
- Cast iron annular wedge gate valves

4.5 OCCUPATIONAL HEALTH AND SAFETY

The 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.