Operation and maintenance manual for

METAL SEATED FLANGED GATE VALVES

P/N 2110 2910

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.

CONTENTS

1 TECHNICAL DESCRIPTION

1.1 PRODUCT DESIGNATION AND IDENTIFICATION

The subject of this Operation and Maintenance Manual is**:**
Type 2110 and 2910 metal seated cast-iron wedge gate valves
- bore with recess underneath the wedge
- wedge (closure) with metal sealing rings made of non-ferrous material
- non-rising spindle
- valve cover o-ring seals

1.2 USE

The Type 2110 and 2910 metal seated wedge gate valves are intended for industrial, heating and water systems, as well as other systems with chemically inert, non-aggressive media. The valves can be used in surface and underground systems and must be installed in horizontal pipelines.

1.3 TECHNICAL SPECIFICATION

The metal seated wedge gate valves with hard seals are intended for transporting potable or industrial water and other liquids (if approved by the manufacturer).

- temperature range: -20°C to +120°C
- Nominal diameter (dimension) range: DN40 to DN200 [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
Mmax [Nm]	55		80			100		

- 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 valve connection flange design is acc. to PN-EN 1092-2: 1999
- with the sizes compliant with the nominal pressure values.
- The installation length and its tolerance is acc. to PN-EN 558: 2012 Series 14
- Nominal pressure PN values: 0.6 MPa
  1.0 MPa
  1.6 MPa

2 DESIGN

2.1 DESCRIPTION OF THE VALVE DESIGN

Type 2110 and 2910 metal seated wedge gate valves manufactured by F.A. "JAFAR" S.A. feature a bore with a recess underneath the wedge, a non-rising stem, and an O-ring stem seal installed in a head-type valve cover. The stem is guided by a bushing in the valve cover neck and a sealing plug. The stem seal is provided by the plug sealing assembly, which is a system of O-rings. The valve closure is a wedge with metal seats which act as the closure seal (pressed flush into the wedge and the valve body seats. The wedge has a replaceable stem nut located within the wedge lug. The stem is equipped with an interlocking collar installed by necking. From the bottom the stem collar rests on a seat in the head via a bushing which acts as a sealed bearing. The plug is

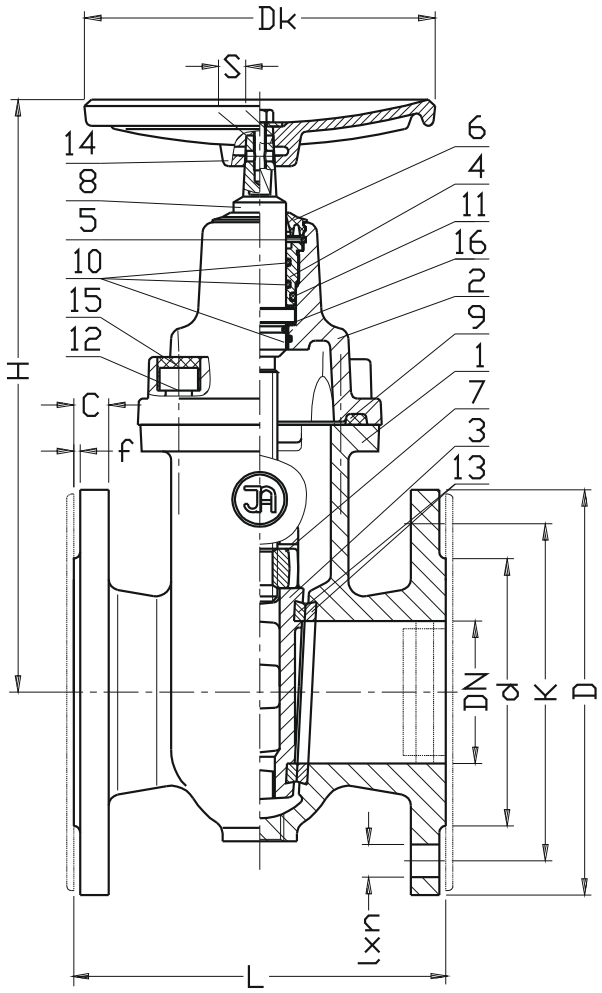
secured against unscrewing using a wire spring ring installed above the flange. The valve cover to body joint is made with hexagon socket head cap screws mounted flush with the valve cover and secured with paraffin compound. The valve cover to body seal is a rubber gasket which also seals the bolts to prevent any leaks from their openings. All inner and outer cast-iron surfaces of the valve are polyvinyl coated. The stem may be operated manually using a hand wheel, a drive actuator (available on Type 2910) or, in case of gate valves located underground, through a hood and gate valve casing, using a T socket.

2.2 MATERIALS

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

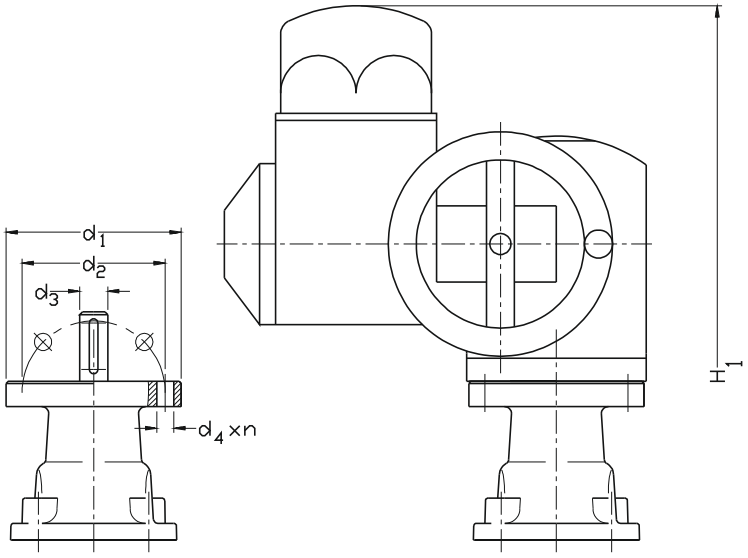
Item	Part designation	Material	Reference standard
1	Body	Grey cast iron, EN-GJL 250	PN-EN 1561: 2012
2	Cover	Grey cast iron, EN-GJS 250	PN-EN 1561: 2012
3	Wedge	Grey cast iron, EN-GJS 250	PN-EN 1561: 2012
4	Sealing plug	Brass	PN-EN 1982: 2010
5	Safety ring	Steel grade 1.1260	PN-74/H-84032
6	Cleaning seal	EPDM	PN-ISO 1629: 2005
7	Spindle nut	Brass	PN-EN 1982:2010
8	Spindle	Steel grade 1.4021	PN-EN 10088-1: 2014
9	Valve cover gasket	EPDM	PN-ISO 1629: 2005
10 11	O-ring	EPDM	PN-ISO 1629:2005
12	Bolt	Steel, Fe/Zn5	PN-EN ISO 4762: 2006
13	Metal ring	Brass	PN-EN 1982:2010
14	Handwheel	Grey cast iron, EN-GJS 250	PN-EN 1561: 2012
15	Bolt plug	Paraffin	
16	Washer	Polyamide PA6	PN-EN ISO 1874-1: 2010

2.3 DIMENSIONS



Version

Drive-ready: TYPE 2110 With electric drive actuator: TYPE 2910



DN	PN	L	H	H1	d	D	K	C	f	l	n	d1	d2	d3	d4	S	Dk	LH thread	Drive	No. of turns	Mass
[mm]	[bar]	[mm]															[mm]		-	-	[kg]
40	PN10 / 16	140	230	461	84	150	110	18	3	22	4	90	70	20	9x4	14	200	Tr16x4	SA 7.6 F7	15	11
50		150	250	481	99	165	125	20	3	22	4					14	200	Tr16x4		18	13
65		170	280	507	118	185	145	20	3	22	4	125	102		11x4	17	200	Tr16x4	SA 10.2 F10	20	18
80		180	310	530	132	200	160	22	3	22	8					17	200	Tr16x4		26	21
100		190	350	563	156	220	180	24	3	23	8					19	250	Tr20x4		30	30
125		200	395	604	184	250	210	26	3	25	8					19	250	Tr24x5		29	42
150		210	450	675	211	285	240	26	3	26	8					19	250	Tr24x5		36	54
200		230	510	750	266	340	295	30	3	29	12					24	320	Tr24x5		46	80

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-EN 1171: 2007	Industrial valves. Cast iron gate valves.
PN-89/H-02650	Valves and pipelines. Pressure and temperature ratings.
PN-EN 1171: 2007	Industrial valves. Cast iron gate valves.
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 and centre-to-face dimensions of metal valves for use in flanged pipe systems. PN-designated valves.
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 1370: 2012	Founding. Surface roughness inspection by visual tactile comparators.
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	Metallic products. Types of inspection documents.
PN-ISO 1629: 2005	Rubbers and latices. Nomenclature.
PN-EN ISO 1872-1: 2000	Plastics. Polyethylene (PE) moulding and extrusion materials. Designation system and basis for specifications.
PN-EN ISO 1873-1: 2000	Plastics. Polypropylene (PP) moulding and extrusion materials. Designation system and basis for specifications.
PN-EN ISO 1874-1: 2010	Plastics. Polyamide (PA) moulding and extrusion materials. Designation system and basis for specification.
PN-EN ISO 12944-5: 2009	Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Protective painting systems.

2.5 ORDERING INFORMATION

Water supply system valves are specific purpose industrial valves, 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
- maximum operating temperature, acc. to PN-89/H-02650.

2.6 PRODUCTION AND ACCEPTANCE

TYPE 2110 and TYPE 2910 metal seated wedge gate valves are accepted and produced 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 valves). All gate valves are leak tested (100%). The tests include external body tightness and closing tightness.

2.7 MARKINGS

The gate valve marking meets the following standards: PN-EN-19: 2005, PN-EN-1171: 2007

The gate 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 surfaces are protected with grey polyvinyl coat.
The anti-corrosion coating layer minimum thickness is 100µm.
The casting surface is pre-treated for polyvinyl coating in accordance with the relevant technical documentation and PN-EN ISO 12944-5: 2009.
The screws connecting the body and the cover are manufactured as stainless, grade 1.4301 or Fe/Zn5 (galvanised steel).

3.2 PACKAGING

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

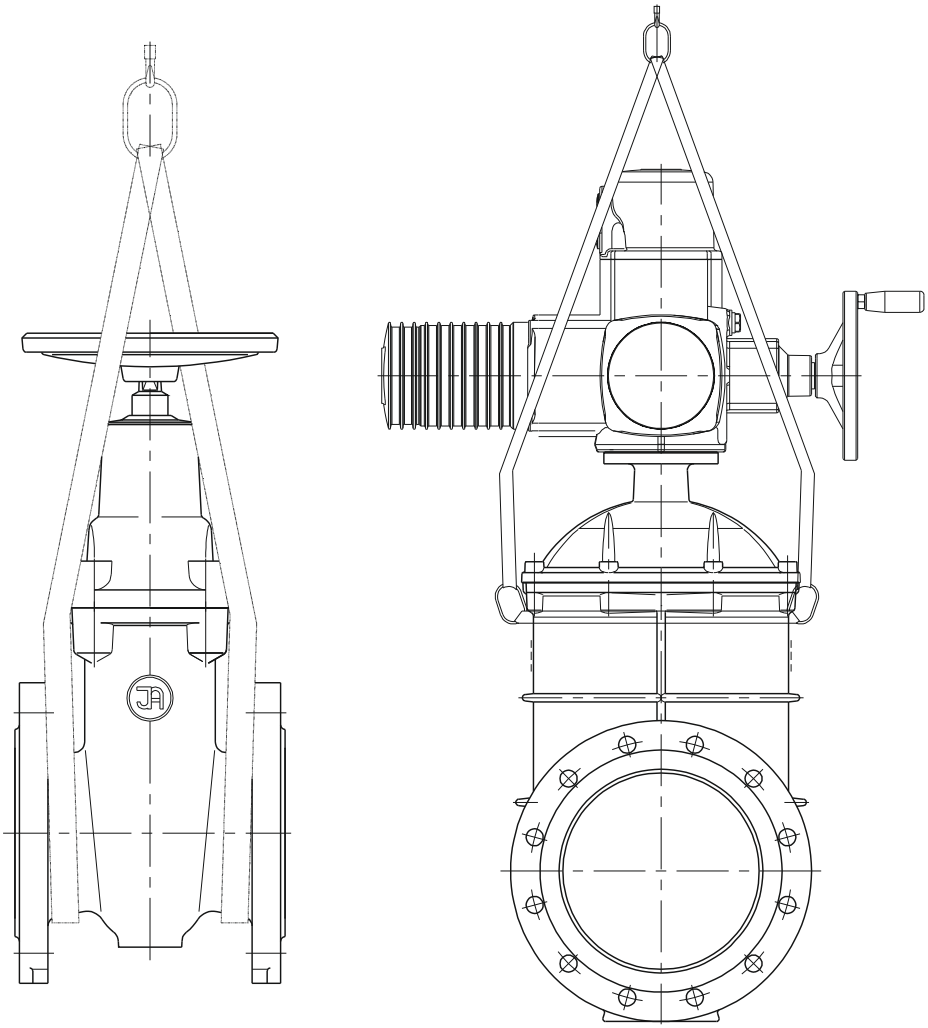
3.3 STORAGE

Store the gate valves in sheltered rooms.

3.4 TRANSPORT

Transport the gate valves on sheltered vehicles.
Never suspend the valve by its drive actuator when handling.

TYPE 2110 TYPE 2910



It is recommended use belt slings as shown in the diagram above
for handling and installation of the gate valves from DN65 to DN200.

4 ASSEMBLY AND INSTALLATION

4.1 ASSEMBLY GUIDELINES

The TYPE 2110 and TYPE 2910 metal seated flanged gate valves can be installed in underground or surface 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 (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.

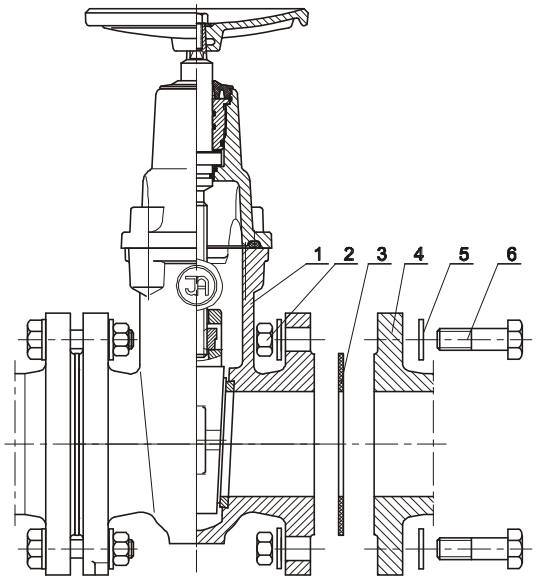
4.2 ASSEMBLY INSTRUCTIONS

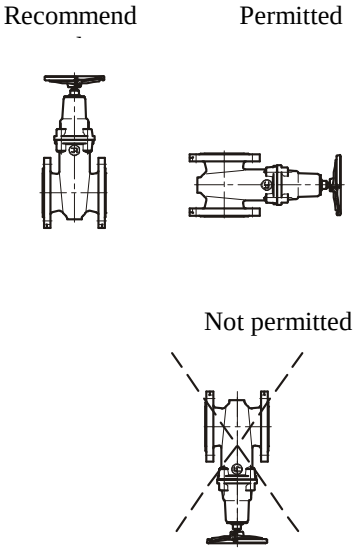
Before attempting to install the valve, check the technical and commercial documents delivered with the product to verify that the media and pipeline operating parameters comply with the manufacturer's declaration. Any change in the operating conditions must be consulted with the valve manufacturer beforehand.

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.

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

The figure below shows the method for coupling the gate valve 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 gate valve partially opened (or closed) may result in seal failure. To ensure full performance, switch the 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 OCCUPATIONAL HEALTH AND SAFETY

The metal seated flanged 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 conditions and period of the warranty is specified in the warranty sheet.