

**Operation**  
**and Maintenance Manual**

**CHECK**  
**FLAP**  
**VALVES**

**P/N**  
**6524**

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.

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## 1 TECHNICAL DESCRIPTION

### 1.1 PRODUCT DESIGNATION AND IDENTIFICATION

The subject of this Operation and Maintenance Manual is:

Type 6524 cast iron flanged check flap valve:

- full bore design
- stainless steel flap (closer)
- graphite seal
- valve cover to body bolted with hex head bolts.

### 1.2 USE

The flanged check flap valves are intended for industrial installations and water supply systems, in both hot and cold water circuits. The valves are intended for overground and underground installations as installed in vertical or horizontal pipelines.

### 1.3 TECHNICAL CHARACTERISTICS

The flanged check flap valve are designed to transport potable water, process water and other liquids as approved by the manufacturer.

- Temperature: -10°C to +300°C
- Nominal diameter (dimension) range:
  - DN40 to DN300 [mm]
- Maximum medium flow rate:
  - liquid: max. 4 [m/s]
  - gas: max. 30 [m/s]
- nominal pressure ratings (PN):
  - 1.0 MPa
  - 1.6 MPa
- Closure tightness: PN-EN 12334: 2005:
  - no leaks with soft seats;
  - max. leak rate: 2mm<sup>3</sup>/s x DN with metal seats.

Choose the maximum operating pressure according to the medium temperature:

Pr [MPa]	Temperature [°C]						
	-10 to 120	150	180	200	230	250	300
PN10	10	9	8.4	8	7.4	7	6
PN16	16	14.4	13.4	12.8	11.8	11.2	9.6

The Type 6524 valve connection flange design is acc. to PN-EN 1092-2: 1999 with the sizes compliant with the nominal pressure values.

Installation length of Type 6524 flanged check flap valves:

- PN-EN 558+A1:2012, Series 48.

## 2 DESIGN

### 2.1 DESCRIPTION OF THE VALVE DESIGN

F.A. „JAFAR” S.A. manufactures the Type 6524 check flap valves for industrial installations. The valve features a cast iron body which houses a free-moving flap (the closure) that is mounted on a pivot being the flap rotation axis clear off the flap diameter. The body chamber is closed from the top by a cast-iron cover that is

sealed with a graphite seal and bolted to the body with hex head bolts. The flap in the valve before installation is located in the lowest valve body part, i.e. directly at the sealing seat (or, if the valve installation orientation is horizontal, the flap rests on the valve seat). In the operating conditions, the flap is held at the top position (tilted position) by the dynamic force of the liquid stream, or in the closed position, where it seals off the valve seat under the back pressure. Install the valves according to the direction of flow marked with the arrow on the valve body. Note that the flap rotation axis must be horizontal. All inner and outer cast-iron surfaces of the valve are epoxy powder coated.

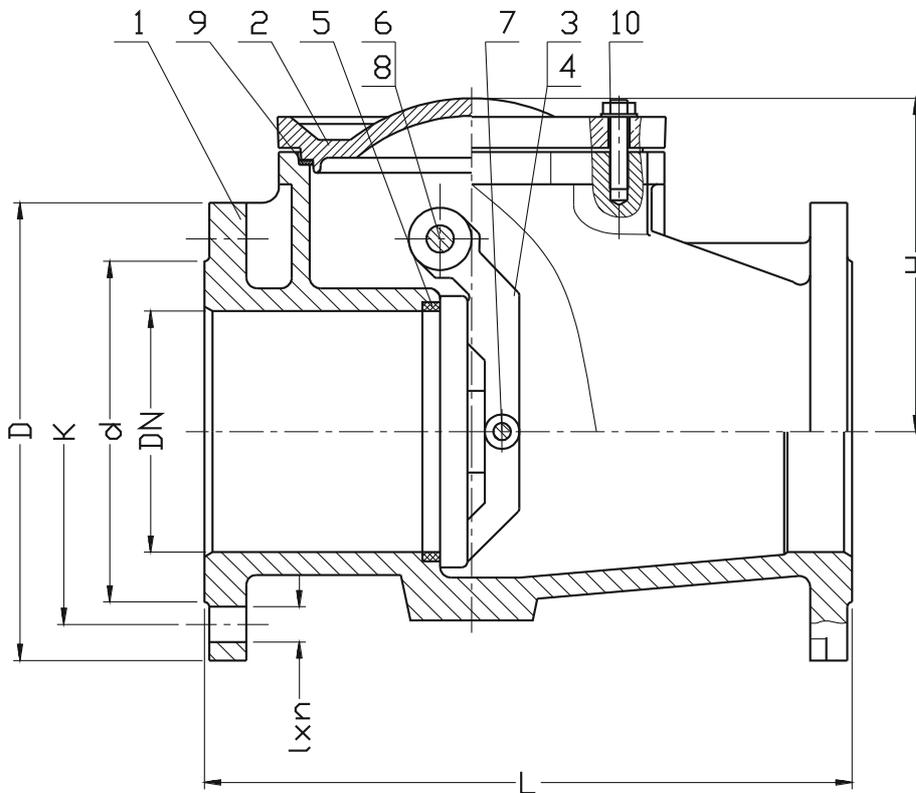
The valve can be custom ordered with a vent valve (B) or a standard cleanout hole (A).

## 2.2 MATERIALS

The table below lists the structural materials of the check flap valves.

Item	Part designation	Material	Reference standard
1	Body	Cast-iron, EN-GJL-250	PN-EN 1561: 2012
2	Cover	Cast-iron, EN-GJL-250	PN-EN 1561: 2012
3	Flap arm	Spheroidal cast-iron, EN-GJS-500-7	PN-EN 1563: 2012
4	Flap	Stainless steel, 1.4027 or bronze, G-CuSn10-B	PN-EN 10088-1: 2014 PN-EN-1982: 2010
5	Casing ring	Stainless steel, 1.4006 or bronze, G-CuSn10-B	PN-EN 10088-1: 2014 PN-EN-1982: 2010
6	Shaft	Stainless steel, 1.4021 or brass, CuZnPb2	PN-EN 10088-1: 2014 PN-EN-1982: 2010
7	Flap pivot	Stainless steel, 1.4021 or brass, CuZnPb2	PN-EN 10088-1: 2014 PN-EN-1982: 2010
8	Shaft bush	Bronze, G-CuSn10-B	PN-EN-1982: 2010
9	Gasket	Graphite w/steel insert, CrNiSt (or EPDM)	PN-ISO 1629: 2005
10	Hex head bolt	Acc. to reference standards	PN-EN ISO 4014: 2004

### 2.3 DIMENSIONS



DN	PN	L	H	D	d	K	l x n	Weight
[mm]	[bar]	[mm]						[kg]
40	16	180	119	150	88	110	19x4	9
50	16	200	120	165	102	125	19x4	11
65	16	240	141	185	122	145	19x4	15
80	16	260	168	200	138	160	19x8/(4)*	21
100	16	300	175	220	158	180	19x8	32
125	16	350	199	250	188	210	19x8	46
150	16	400	217	285	212	240	23x8	60
200	16	500	277	340	268	295	23x8(12)*	120
250	16	600	337	405	320	355	28x12	180
300	16	700	374	460	370	410	28x12	250

\*) - 10 bar

## 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 1074-3: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Check valves.
PN-89/H-02650	Valves and pipelines. Pressure and temperature ratings.
PN-EN 12334: 2005	Industrial valves. Cast iron check valves.
PN-EN 1092-2: 1999	Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges.
PN-EN 19: 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 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-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	ISO general purpose metric screw threads. Tolerances. Principles and basic data.
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 paint 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 process water);

and:

- nominal diameter, acc. to PN-EN ISO 6708: 1998
- nominal pressure, acc. to PN-89/H-02650;
- body material type, acc. to PN-EN 1561: 2000
- maximum operating temperature, acc. to PN-89/H-02650.

## 2.6 PRODUCTION AND ACCEPTANCE

The flanged check flap valves are accepted and produced in accordance with PN-EN 12334:2005 (Industrial valves. Cast iron check valves) and PN-EN 12266-1:2007 (Industrial fittings. Testing of valves). All valves are leak tested (100%). The tests include external body tightness and closing tightness at high and low pressure values.

## **2.7 MARKING**

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 neck. 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 250µm.

The casting surface is pre-treated for epoxy coating in accordance with the relevant technical documentation and PN-EN ISO 12944-5: 2001.

The cover-to-body fastening bolts are grade OH18N9 (stainless steel) or Fe/Zn5 (galvanized steel).

### **3.2 PACKAGING**

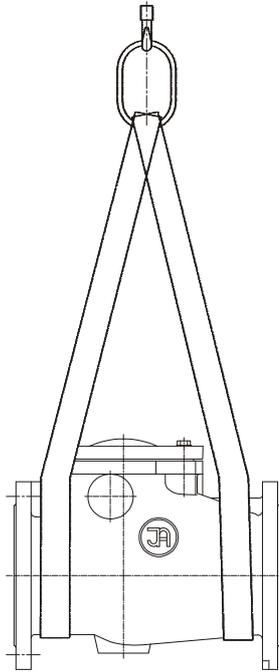
The flanged check flap valves are packed on EURO pallets (1200x800) and protected with heat-shrunk film.

### **3.3 STORAGE**

Store the check flap valves in sheltered rooms.

### 3.4 TRANSPORT

Transport the check flap valves on sheltered vehicles. The following diagram shows an example of vertical handling on belt slings.



## 4 ASSEMBLY AND INSTALLATION

### 4.1 ASSEMBLY GUIDELINES

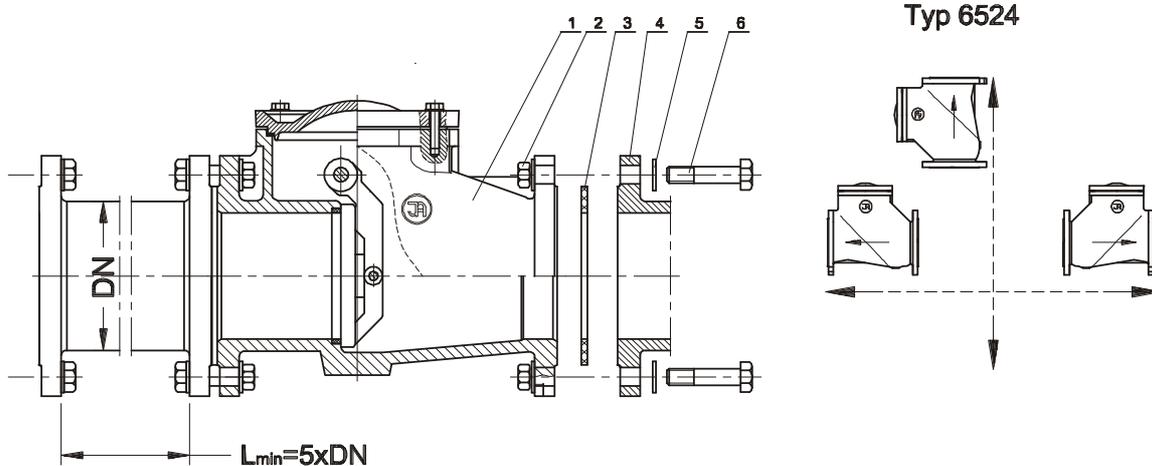
The Type 6524 flanged check flap valves can be installed in underground or overground pipelines both in horizontal or vertical orientation as shown in the following figure. The flanged valves are suitable for joining with the flanged ends of pipelines with the size equal to that of the valve flanges. Note that the system must not expose the valve to bending or tensile stress from loading with the unsupported pipeline sections. The valve assembled and delivered by the manufacturer is ready for installation. Disassembly of the valve components without proper care may result in loss of integrity.

### 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.

The assembly method is shown in the following figure:



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

#### CAUTION!

**Install the valve downstream of a straight pipeline the length of which is at least 5 times the pipeline nominal diameter. The straight pipeline runs upstream and downstream of the valve must stabilise the flow stream. Excessive flow rates may result in turbulence and noisy valve performance.**

#### 4.3 OPERATION

The flanged check flap valves shall be operated according to the requirements for check valves, i.e. in the orientation shown in the permitted orientation diagram. The check flap valve has a self-cleaning action. However, it is recommended to periodically purge the valve with fresh water (once a year) to assure full performance. Hard solids with the size above 5 mm should be filtered out of the transmitted medium to prevent seizure of the flap inside the body. If the flap is stuck, start the installation pump for a few seconds. If the problem persists, stop all installation pumps, isolate the medium flow on the valve's pressure side, open the valve cover and free the flap.

#### 4.4 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.