

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

**CHECK**  
**BALL**  
**VALVES**

**P/N**  
**6616**

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.

|  |   |
|--|---|
| 1 TECHNICAL DESCRIPTION .....                    | 3 |
| 1.1 PRODUCT DESIGNATION AND IDENTIFICATION ..... | 3 |
| 1.2 USE .....                                    | 3 |
| 1.3 TECHNICAL CHARACTERISTICS .....              | 3 |
| 2 DESIGN .....                                   | 3 |
| 2.1 DESCRIPTION OF THE VALVE DESIGN .....        | 3 |
| 2.2 MATERIALS .....                              | 4 |
| 2.3 DIMENSIONS .....                             | 5 |
| 2.4 REFERENCE STANDARDS .....                    | 5 |
| 2.5 ORDERING INFORMATION .....                   | 6 |
| 2.6 PRODUCTION AND ACCEPTANCE .....              | 6 |
| 2.7 MARKING .....                                | 6 |
| 3 PROTECTION, STORAGE & TRANSPORT .....          | 6 |
| 3.1 PROTECTIVE COATINGS .....                    | 6 |
| 3.2 PACKAGING .....                              | 7 |
| 3.3 STORAGE .....                                | 7 |
| 3.4 TRANSPORT .....                              | 7 |
| 4 ASSEMBLY AND INSTALLATION .....                | 7 |
| 4.1 ASSEMBLY GUIDELINES .....                    | 7 |
| 4.2 ASSEMBLY INSTRUCTIONS .....                  | 7 |
| 4.3 OPERATION .....                              | 8 |
| 4.4 OCCUPATIONAL HEALTH AND SAFETY .....         | 8 |
| 5 WARRANTY TERMS AND CONDITIONS .....            | 8 |

## 1 TECHNICAL DESCRIPTION

### 1.1 PRODUCT DESIGNATION AND IDENTIFICATION

The subject of this Operation and Maintenance Manual is:

Type 6616 cast iron threaded ends check ball valve

- full bore design
- ball (closure) embedded in 100% pure elastomer
- valve cover o-ring seal
- cover flush-bolted to body

### 1.2 USE

The Type 6616 threaded ends check ball valves are intended for industrial installations, e.g. sewage discharge, or water supply systems, e.g. for potable water. The valves are intended for overground and underground installations as installed in vertical or horizontal pipelines.

**The Type 6616 cast iron threaded ends check ball valves are intended for pumping systems.**

### 1.3 TECHNICAL CHARACTERISTICS

The Type 6616 cast iron threaded ends check ball valve are designed to transport potable water, process water and other liquids as approved by the manufacturer.

- Operating temperature: -10°C to +70°C
- Available diameters (dimensions): - DN25 to DN50 [mm] for Type 6616 valves
- Maximum medium flow rate: - liquid: max. 4 [m/s]
- nominal pressure ratings (PN): - 1.0 MPa  
- 1.6 MPa

Maximum opening break-off pressure at zero back pressure:

|                   |         |           |           |         |
|-------------------|---------|-----------|-----------|---------|
| <b>DN [mm]</b>    | 25 (1") | 32 (1 ¼") | 40 (1 ½") | 50 (2") |
| <b>Pmax [MPa]</b> | 0.01    | 0.01      | 0.01      | 0.01    |

The ends of the type 6616 valves are designed for connection with tapped pipes with the Imperial pipe thread sizes: 1"; 1 ¼"; 1 ½"; 2" ref. PN-EN ISO 228-1: 2005.

Installation length of valves with threaded ends (Type 6616):

- see the size table.

## 2 DESIGN

### 2.1 DESCRIPTION OF THE VALVE DESIGN

F.A. „JAFAR” S.A. manufactures the Type 6616 (threaded ends) check ball valves for **pumping systems**. The valve features a cast iron body that houses a loose ball inside (the closure). The body chamber is closed from the top by a cast-iron cover that is sealed with an o-ring and bolted to the body with hex cap bolts which are flush with the valve cover seats. The ball in the valve before installation is located in the lowest valve body part, i.e. directly at the sealing seat and rests freely on the guides (or, if the valve installation orientation is horizontal, the ball sits in the valve seat). In the operating conditions, the ball is held at the top position (under the valve cover) by the dynamic force of the liquid stream, or in the closed position, where it seals off the valve seat under the back pressure. All inner and outer cast-iron surfaces of the valve are epoxy powder coated.

The check ball valves for **pumping systems** have the ball density higher than water.

The valve can be custom ordered with a cleaning valve (B)

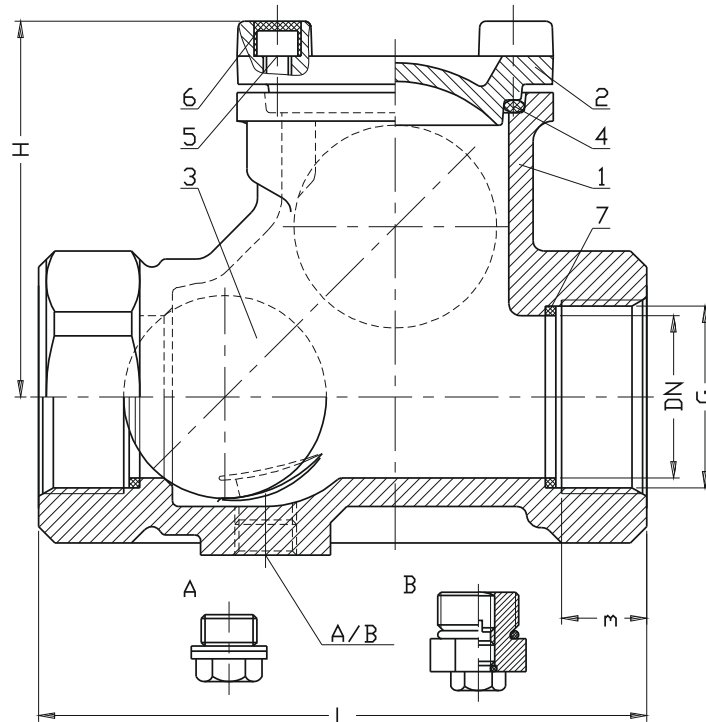
or a standard cleanout hole (A).

## 2.2 MATERIALS

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

| <b>Item</b> | <b>Part designation</b> | <b>Material</b>                                     | <b>Reference standard</b>                      |
|-------------|-------------------------|---|--|
| 1           | Body                    | Spheroidal cast iron<br>EN-GJS-400-15               | PN-EN 1563: 2012                               |
| 2           | Cover                   | Spheroidal cast iron<br>EN-GJS-400-15               | PN-EN 1563: 2012                               |
| 3           | Rubber-embedded ball    | Aluminium alloy<br>in rubber coating: NBR (or EPDM) | PN-EN 1706: 2010<br>PN-ISO 1629: 2005          |
| 4           | Valve cover gasket      | Rubber: NBR (or EPDM)                               | PN-ISO 1629: 2005                              |
| 5           | Bolt, cap,<br>hex       | Acc. to reference standards                         | PN-EN ISO 4762: 2006                           |
| 6           | Bolt plug               | Paraffin  | acc. to manufacturer's Technical<br>Guidelines |
| 7           | Gasket                  | Rubber: NBR (or EPDM)                               | PN-ISO 1629: 2005                              |

## 2.3 DIMENSIONS



| DN   | G    | L    | m  | H   | Weight |
|------|------|------|----|-----|--------|
| [mm] | [in] | [mm] |    |     | [kg]   |
| 25   | 1"   | 120  | 18 | 75  | 1.7    |
| 32   | 5/4" | 140  | 18 | 75  | 2.2    |
| 40   | 6/4" | 150  | 20 | 89  | 3.1    |
| 50   | 2"   | 220  | 35 | 113 | 5.0    |

## 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. 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-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.   |
| DIN 6912: 2006          | Hexagon socket low 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 sewage;
- 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 1563: 2012
- maximum operating temperature, acc. to PN-89/H-02650.

## 2.6 PRODUCTION AND ACCEPTANCE

The check ball valves are accepted and produced in accordance with PN-EN 1074-3: 2002 (Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Check valves) and PN-EN 12266-1: 2007 (Industrial valves. 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 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 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 cover-to-body fastening bolts are grade OH18N9 (stainless steel) or Fe/Zn5 (galvanized steel).

### 3.2 PACKAGING

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

### 3.3 STORAGE

Store the check ball valves in sheltered rooms.

### 3.4 TRANSPORT

Transport the check ball valves on sheltered vehicles.

## 4 ASSEMBLY AND INSTALLATION

### 4.1 ASSEMBLY GUIDELINES

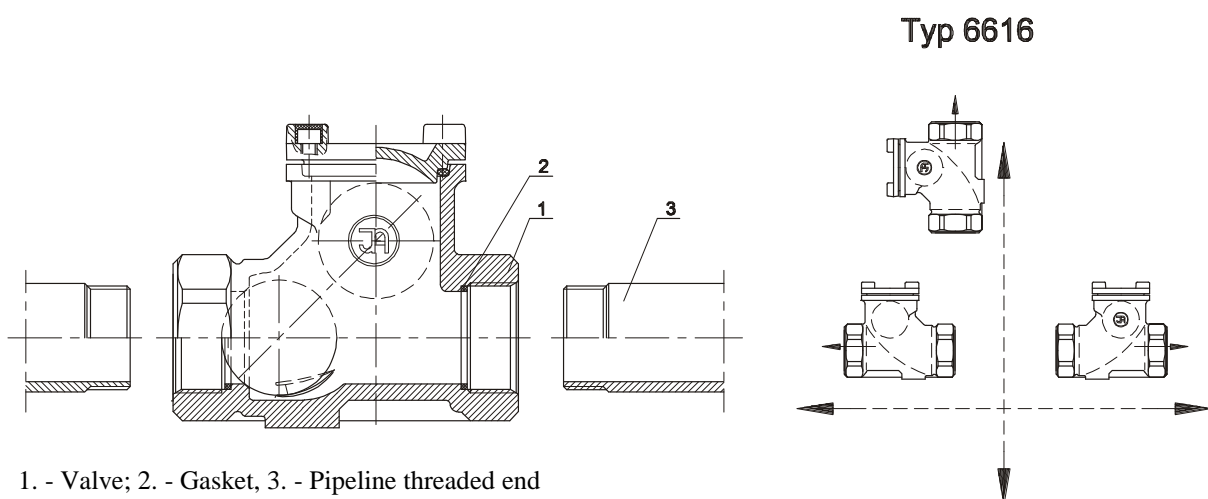
The Type 6616 threaded ends check ball valves can be installed in underground or overground pipelines both in horizontal or vertical orientation as shown in the following figure. The valves with threaded ends feature a threaded connection port for the discharge pipe. Note that the system must not expose 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. - Gasket, 3. - Pipeline threaded end

#### CAUTION!

**Install the valve downstream of a straight pipeline the length of which is at least 5 times the pipeline nominal diameter.**

### **4.3 OPERATION**

The threaded ends check ball valves shall be operated according to the requirements for check valves, i.e. in the orientation shown in the permitted orientation diagram. The check ball 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 ball inside the body and damage to the rubber ball coat. If the ball 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 ball.

### **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.