

Operation
and Maintenance Manual

**CHECK
BALL
VALVES**

**P/N
6516**

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 6516 cast iron flanged 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 6516 flanged 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 6516 cast iron flanged check ball valves are intended for pumping systems.

1.3 TECHNICAL CHARACTERISTICS

The Type 6516 cast iron flanged check ball valve are designed to transport potable water, process water (sewage) and other liquids as approved by the manufacturer.

- Operating temperature: -10°C to $+70^{\circ}\text{C}$
- Available diameters (dimensions): - DN50 to DN500 [mm] for Type 6516 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:

DN [mm]	50	65	80	100	125	150	200	250	300	350	400	500
Pmax [MPa]	0.01		0.02			0.03		0.04			0.05	

The Type 6516 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 6516) flange valves is acc. to PN-EN 558+A1: 2012, series 48.

2 DESIGN

2.1 DESCRIPTION OF THE VALVE DESIGN

F.A. „JAFAR” S.A. manufactures the Type 6516 (flanged) 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.

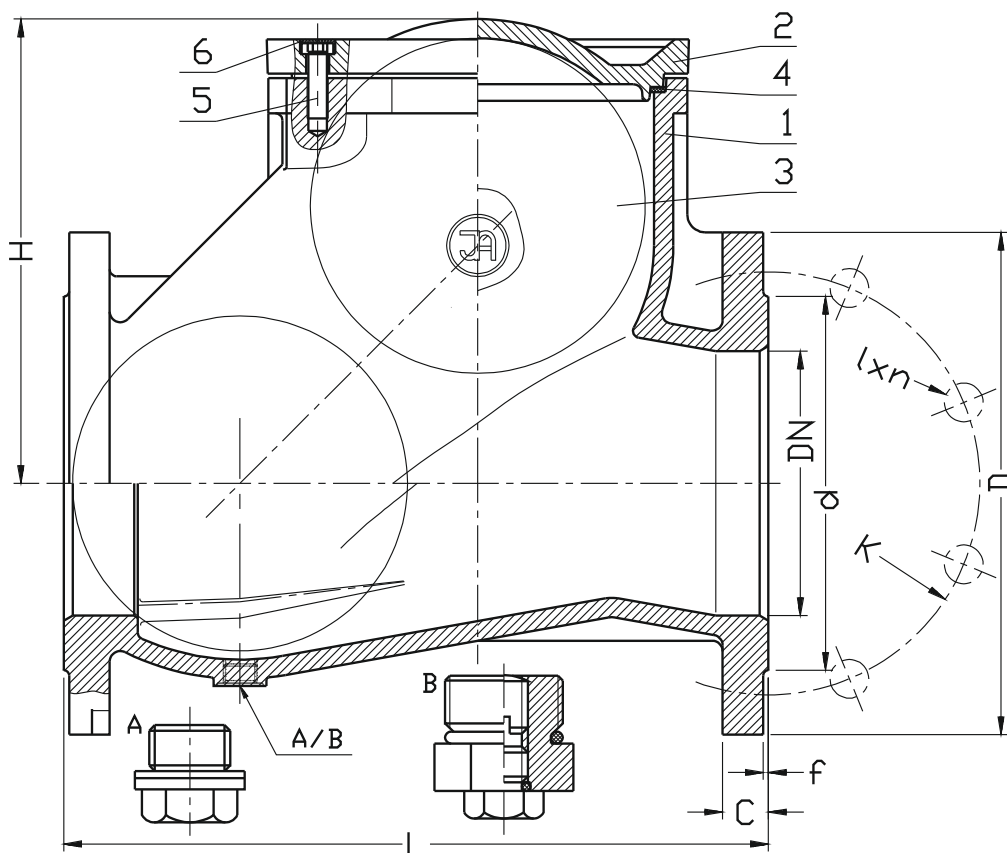
The valve can be custom ordered with a cleaning valve (B) or a standard cleanout hole (A).

2.2 MATERIALS

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

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

2.3 DIMENSIONS



DN	PN	L Series 48	H	d	D	K	I	C	f	n	Weight
[mm]	[bar]				[mm]					-	[kg]
50	PN16	200	113	102	165	125	19	20	3	4	8
65		240	126	122	185	145	19	20	3	4	13
80		260	162	138	200	160	19	22	3	8	17
100		300	194	158	220	180	19	24	3	8	24
125		350	214	188	250	210	19	22	3	8	34
150		400	260	212	285	240	23	26	3	8	52
200		500	320	268	340	295	23	22	3	12	83
250		600	365	320	405	350	23	30	3	12	136
300	PN10	700	427	378	460	400	23	30	4	12	229
350		800	427	429	520	460	23	32	4	16	260
400		900	537	480	580	515	28	32	4	16	395
500		1100	650	582	670	620	28	34	4	20	560

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 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-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

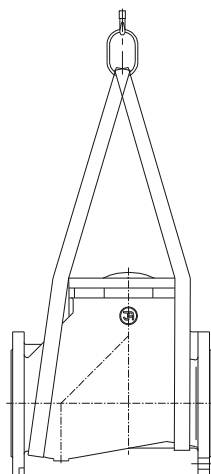
The flanged check ball valves are packed on EURO pallets (1200x800) and protected with heat-shrunk film.

3.3 STORAGE

Store the check ball valves in sheltered rooms.

3.4 TRANSPORT

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



The ball valves from DN100 to DN5000 shall be installed and handled with slings.

4 ASSEMBLY AND INSTALLATION

4.1 ASSEMBLY GUIDELINES

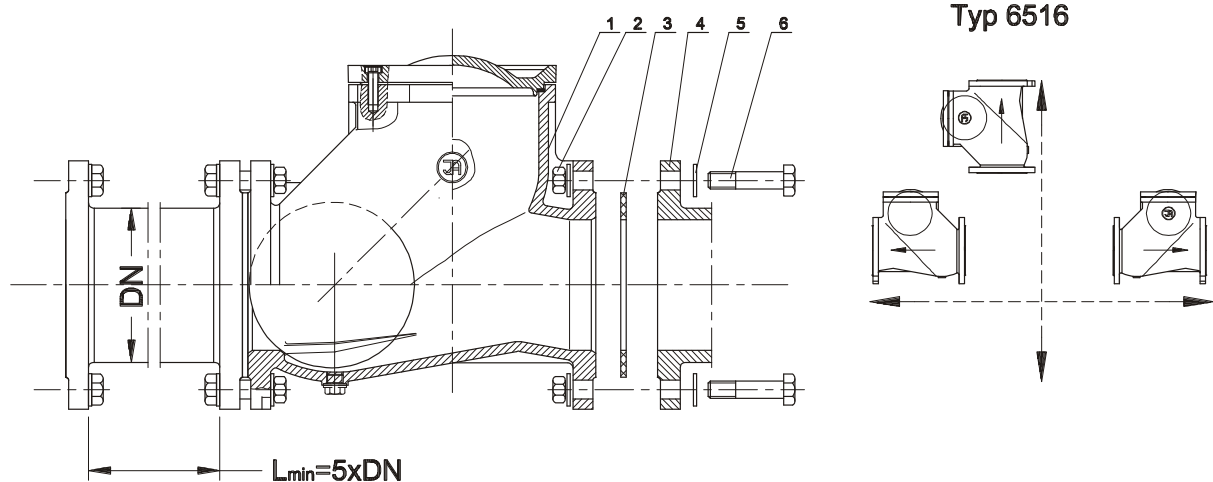
The Type 6516 check ball valves can be installed in underground or overground pipelines both in horizontal or vertical orientation as shown in the following figure. The flanged valves are suitable for joining with the flanged ends of pipelines with the size equal to that of the valve flanges. Note that 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.

4.3 OPERATION

The flanged 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.