

Operation and maintenance
manual for

FLANGE-TO-FLANGE BUTTERFLY
CHECK VALVES

P/N
6535

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 design changes to the presented product.

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1 TECHNICAL DESCRIPTION

1.1 PRODUCT DESIGNATION AND IDENTIFICATION

The subject of this Operation and Maintenance Manual is:

TYPE 6535 flange-to-flange butterfly check valve, standard cast-iron version.

- simple compact design
- elastomer seal in the body
- maintenance-free
- stainless steel butterfly wafers
- backflow (against the direction arrow on the body) closes the valve

1.2 USE

The Type 6535 valves are intended for industrial and water supply systems. The valves can be operated both in underground and overground installations as installed in vertical or horizontal pipelines.

The check valves are available in various material versions and installed in water supply systems and industrial processing installations.

Check valves are designed to protect the upstream installation from back flow (i.e. the movement against the proper flow direction, marked with an arrow on the valve body, depending on the sealing material).

1.3 TECHNICAL SPECIFICATION

Available manufactured dimensions: DN40 - DN400.

- Nominal pressure: max. 1.6 MPa
- Operating temperature range: -10°C to +110°C
- Maximum flow rate: liquid: 4m/s

Performance requirements:

A properly installed valve should work automatically. When the medium flows back, the flap wafer is closed with the assistance of a spring.

The valve ends for installation between pipeline flanges are designed acc. to PN-EN 1092-2: 1999, with appropriate dimensions for the assumed nominal pressures.

2 DESIGN

2.1 DESCRIPTION OF THE VALVE DESIGN

MANUFACTURE AND ACCEPTANCE

The butterfly check valves are manufactured and accepted in accordance with PN-EN 1074-3:2005 and PN-EN12266-1:2003. The check valves are tested with water for body strength and tightness and closure tightness. Other operating conditions, e.g. temperatures and media, must be consulted with the valve manufacturer beforehand. The butterfly check valves feature a closure in the form of a wafer flap (2) which is split and freely mounted on the shank (3). The closing action is assisted by the spring (4) which presses the wafers against the seat. The list of material versions for the DN40 to DN400 valves is given in the table.

2.2 MATERIALS

The following lists the components of the butterfly check valve and their reference standards. Other versions are available on custom order agreed with the manufacturer.

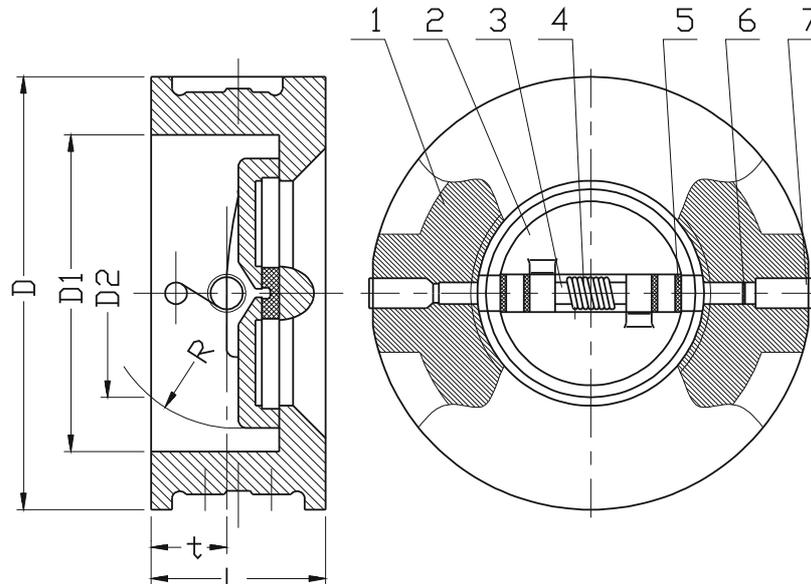
NOTE:

The normal operating life is limited by the ageing time of the elastomer of the shaft and closure as follows:
 - 5 years with EPDM seals.

The specified operating life is given for properly operated valves and during which the durability will be maintained to water and other non-aggressive media at operating temperatures at $\leq 110^{\circ}\text{C}$.

Item	Part designation	Material	Reference standard
1.	Body	Grey cast iron EN-GJL 250	PN-EN 1561:2012
2.	Wafer	Stainless steel, 1.4571	PN-EN10088-1:2014
3.	Spindle	Stainless steel, 1.4571	PN-EN10088-1:2014
4.	Spring	Stainless steel, 1.4571	PN-EN10088-1:2014
5.	Washer	PTFE	Manufacturer's catalogue
6.	O-ring	EPDM	PN-ISO 1629:2005
7.	Nut	Stainless steel, 1.4571	PN-EN10088-1:2014

2.3 DIMENSIONS



DN	D	D1	D2	L	R	t	Weight
[mm]							[kg]
40	92	55	37	43	23	17,5	0,75
50	107	65	40	43	27	18,4	1,5
65	127	80	60	46	35	19,8	2,1
80	142	94	70	64	42	27,7	3,3
100	162	117	88	64	50	27,7	4,0
125	192	145	115	70	64	30,3	7,0
150	218	171	134	76	77	31,6	9,0
200	273	224	182	89	102,5	32,9	15,0
250	328	265	220	114	125	50,5	26,0
300	378	310	260	114	146	43,3	37,0
350	443	356	356	140	167	45,5	55,0
400	448	410	410	184	190	52	80,0

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.
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	General purpose ISO metric 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)
- 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

The Type 6535 butterfly check valves are manufactured and accepted 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 metallic valves). All valves are leak tested (100%). The tests include external body tightness and closure tightness.

2.7 MARKINGS

The valve marking is defined in the following standards: PN-EN 19: 2005, PN-EN-1074-1: 2002. The valve body features markings on the front and back walls of the body chamber. The marking contains the following data:

- valve type (as defined by a product standard number)
- nominal diameter
- nominal pressure
- body material type
- manufacturer's 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
- Polish Construction Mark "B" and/or the CE mark (as applicable)
- product type.

3 PROTECTION, STORAGE & TRANSPORT

3.1 PROTECTIVE COATINGS

All inner and outer gate valve surfaces are protected with electro-deposited epoxy coat, or with other coatings, as agreed. The paint is approved for contact with food products.

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 standard PN-EN ISO 12944-5: 2009.

3.2 PACKAGING

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

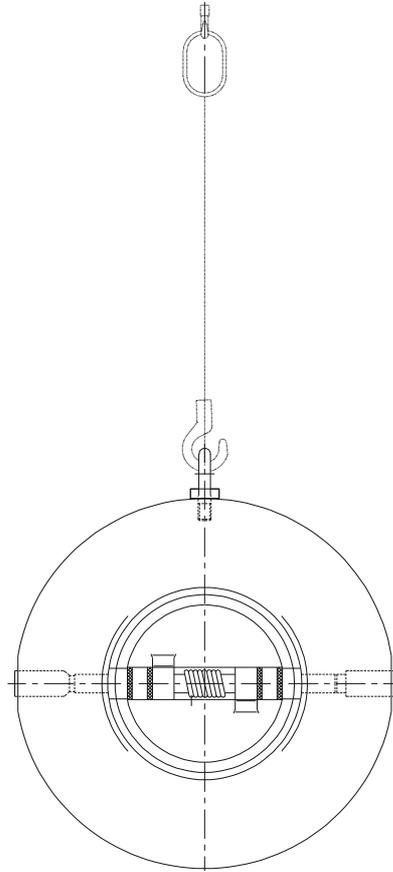
3.3 STORAGE

Store the butterfly check ball valves in sheltered rooms.

3.4 TRANSPORT

Transport the Type 6535 check valves on sheltered vehicles. Prior to transport, the valves are secured against weather with a protective coat, preservatives and lubricated, and the closures are set in the closed

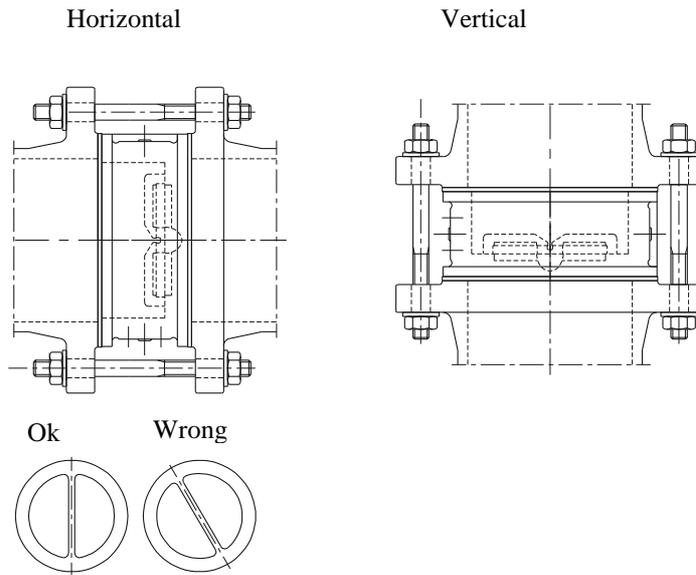
position. Depending on the valve diameter, the valves are transported collectively in crates or unit packages, or on special purpose racks. If transported on racks, the valve inlet and outlet ports are stopped. When installing the valves on the pipeline, handle the DN200 to DN400 products with lifting handles. **DO NOT** attach the lifting equipment to the inner parts of the shank or the body.



4 ASSEMBLY AND INSTALLATION

4.1 ASSEMBLY GUIDELINES

The Type 6535 flange-to-flange butterfly check valves can be installed in underground or overground pipelines both in horizontal or vertical orientation. The valves are suitable for joining with the flanged ends of pipelines with the size equal to the installation length. 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.

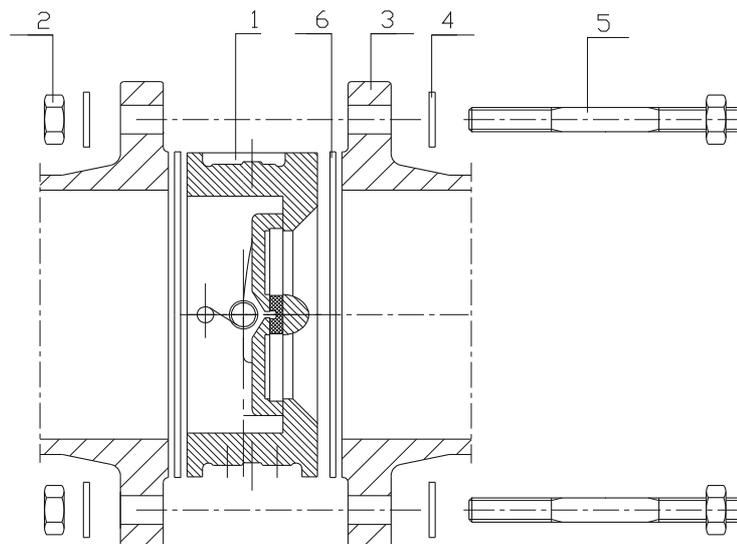
Before attempting to assemble the valve, remove the main bore plugs, check the inner surfaces of the valve and thoroughly flush with water, if necessary.

When installing a flange-to-flange butterfly check valve in a pipeline, first remove all transport preservation from the surfaces, thoroughly clean the flange faces, install the seals, and bolt down with bolts long enough to tighten the adjacent flanges of the pipeline together. The tightening torque of the bolt nuts is specified in the standard PN-63/M-82056.

Caution! If the product has mechanical damage, do not install it in the pipeline.

The installation and design of the butterfly check valve is shown in the following figure:

Pipeline installation diagram



1. Butterfly check valve; 2. Nut; 3. Pipeline flange; 4. Washer; 5. Fastening bolt; 6. Flange seal.

4.3 OPERATION

The check valves shall be operated according to the requirements for check valves, i.e. in the orientation shown in the diagram above. The check valve is maintenance free. Exceeding the operating limits of the valve may result in damage that will not be covered by the warranty or the suretyship granted by the manufacturer.

4.4 OCCUPATIONAL HEALTH AND SAFETY

The check 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 the products 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.