

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

**TWO-STAGE**  
**AIR VALVES**  
**FOR SEWAGE**

**P/N**  
**7020, 7025**

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 .....	6
2.4	REFERENCE STANDARDS .....	8
2.5	ORDERING INFORMATION .....	8
2.6	PRODUCTION AND ACCEPTANCE .....	8
2.7	MARKING .....	9
3	PROTECTION, STORAGE & TRANSPORT .....	9
3.1	PROTECTIVE COATINGS .....	9
3.2	PACKAGING .....	9
3.3	STORAGE .....	9
3.4	TRANSPORT .....	9
4	ASSEMBLY AND INSTALLATION .....	10
4.1	ASSEMBLY GUIDELINES .....	10
4.2	ASSEMBLY INSTRUCTIONS .....	11
4.3	OPERATION .....	11
4.3	OPERATION .....	12
4.4	OCCUPATIONAL HEALTH AND SAFETY .....	12
5	WARRANTY TERMS AND CONDITIONS .....	12

## 1 TECHNICAL DESCRIPTION

### 1.1 PRODUCT DESIGNATION AND IDENTIFICATION

The subject of this Operation and Maintenance Manual is:  
the two-stage air valve for sewage:

#### **TYPE 7020**

- carbon steel body and cover with epoxy paint coat as an anti-corrosion protection
- PP or stainless steel float
- nuts, washers and bolts (galvanized) for fastening the body to the cover

#### **TYPE 7025**

- stainless steel body and cover
- stainless steel float
- nuts, washers and bolts (stainless steel) for fastening the body to the cover

All other parts are made of stainless steel on both valve types.

### 1.2 USE

The flanged air valves are intended for venting air from or aeration of sewage pipelines. The valves are intended for overground and underground systems and require to be installed at the highest elevation point of the horizontal pipeline.

The flanged air valves work automatically, and their design allows for partial reduction of hydraulic shocks. The air vent seat is isolated from the sewage medium by an air cushion in the top section of the valve vessel.

### 1.3 TECHNICAL CHARACTERISTICS

The Type 7020 and 7025 steel flanged air valves are intended for aeration and air venting of pipelines.

- Available diameters (dimensions): - DN50 to DN200 [mm]
- Maximum medium flow rate:
  - liquid: max. 4 [m/s]
  - gas: max. 15 [m/s]
- Nominal pressure: PN to 1.6 MPa
- Operating pressure 0.00 to 1.6 MPa
- Medium temperature: 70°C
- Max. aeration/venting rate, stage 1 190 m<sup>3</sup>/h
- Max. venting rate, stage 2 7.5m<sup>3</sup>/h

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

The TYPE 7025 and 7025 flanged valves are as listed in the technical documentation.

The valves are selected for the air intake/exhaust volume, i.e. the pipeline diameter and the vented pipeline length. The maximum flow rate in the valve bore must not exceed 20 m/s to prevent entrainment of the float and isolating the flow through the main valve stage before the air venting ends.

## 2 DESIGN

### 2.1 DESCRIPTION OF THE VALVE DESIGN

F.A. "JAFAR" S.A. is the manufacturer of Type 7020 and 7025 flanged air valves for sewage. The valves feature a steel body which houses a float in the bottom part. The float controls two closing blocks, which are isolated from the sewage due to their positioning in the top part of the valve where gas accumulates to form an air cushion. The main valve is the valve stage 1 (opened at low pressure). The valve stage 1 vents air when the pipeline is primed or feeds air into the pipeline when the pipe is emptied. The valve stage 2 (opens across the entire operating pressure range) vents air when the pipeline is working. The plunger is made either of stainless steel or polypropylene (PP) at a density below the water density, which allows the device to raise when the valve

is primed with sewage. The float density has been selected to have it stay at the valve body bottom when air is vented or lift as the medium level rises when the system is primed, and cut off both stages and air flow. During aeration, the float descends with the falling medium level to open the stages and admit air into the pipeline.

The body chamber is covered by the main valve seat and sealed with an o-ring which is pressed by the cover bolted down to the body.

**Install the air valve in the vertical orientation at the highest elevation of the pipeline or at its bends.**

## 2.2 MATERIALS

The following tables list the materials used for the air valves.

### TYPE 7020

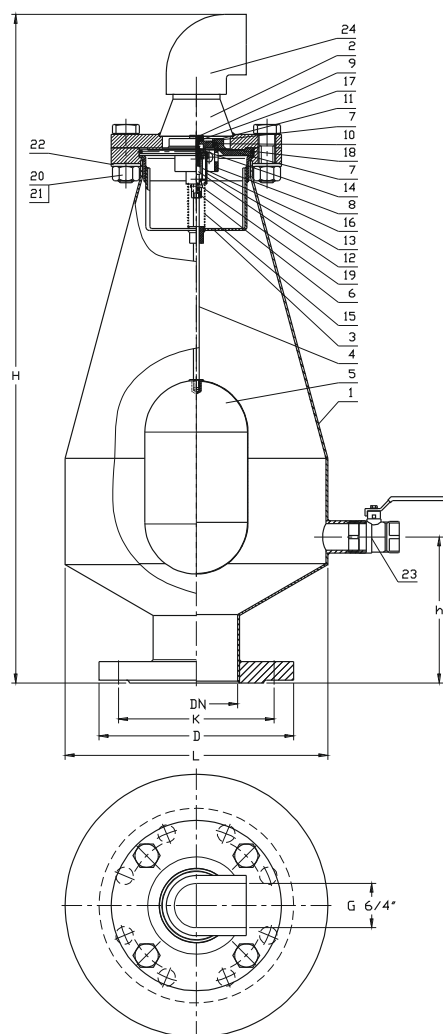
Item	Part designation	Material	Reference standard
1	Body assembly	Steel, S235JR	PN-EN 10025-2: 2007
2	Cover	Steel, S235JR	PN-EN 10025-2: 2007
3	Cage assembly	Stainless steel 1.4301	PN-EN 10088-1: 2014
4	Lever	Stainless steel 1.4301	PN-EN 10088-1: 2014
5	Float	Polyethylene Stainless steel 1.4301	PN-EN ISO 1872-1:2000 PN-EN 10088-1: 2014
6	Link	Stainless steel 1.4301	PN-EN 10088-1: 2014
7	Seat	Stainless steel 1.4301	PN-EN 10088-1: 2014
8	Cage	Stainless steel 1.4301	PN-EN 10088-1: 2014
9	Nozzle	Stainless steel 1.4301	PN-EN 10088-1: 2014
10	Mushroom seal	NBR	PN-ISO 1629: 2005
11	Mushroom	Stainless steel 1.4301	PN-EN 10088-1: 2014
12	Plunger	Stainless steel 1.4301	PN-EN 10088-1: 2014
13	Plunger holder	Stainless steel 1.4301	PN-EN 10088-1: 2014
14	Valve seal	NBR	PN-ISO 1629: 2005
15	Spring	Stainless steel 1.4301	PN-EN 10088-1: 2014
16	Valve spring	Stainless steel 1.4301	PN-EN 10088-1: 2014
17	Gasket	NBR	PN-ISO 1629: 2005
18	O-ring seal	NBR	PN-ISO 1629: 2005
19	Bolt, M3x10-A2	Stainless steel	PN-EN ISO 10642: 2006
20	Bolt, M16x50-8.8-A-Fe/Zn5	Stainless steel	PN-EN ISO 4017: 2011
21	Nut	Stainless steel	PN-EN ISO 4017: 2011
22	Washer	Stainless steel	PN-EN ISO 7091: 2003
23	Ball cock, DN25 PN16		Manufacturer's catalogue
24	Elbow, PVC 6/4"		Manufacturer's catalogue

## TYPE 7025

Item	Part designation	Material	Reference standard
1	Body assembly	Stainless steel 1.4301	PN-EN 10088-1: 2014
2	Cover	Stainless steel 1.4301	PN-EN 10088-1: 2014
3	Cage assembly	Stainless steel 1.4301	PN-EN 10088-1: 2014
4	Lever	Stainless steel 1.4301	PN-EN 10088-1: 2014
5	Float	Stainless steel 1.4301	PN-EN 10088-1: 2014
6	Link	Stainless steel 1.4301	PN-EN 10088-1: 2014
7	Seat	Stainless steel 1.4301	PN-EN 10088-1: 2014
8	Cage	Stainless steel 1.4301	PN-EN 10088-1: 2014
9	Nozzle	Stainless steel 1.4301	PN-EN 10088-1: 2014
10	Mushroom seal	NBR	PN-ISO 1629: 2005
11	Mushroom	Stainless steel 1.4301	PN-EN 10088-1: 2014
12	Plunger	Stainless steel 1.4301	PN-EN 10088-1: 2014
13	Plunger holder	Stainless steel 1.4301	PN-EN 10088-1: 2014
14	Valve seal	NBR	PN-ISO 1629: 2005
15	Spring	Stainless steel 1.4301	PN-EN 10088-1: 2014
16	Valve spring	Stainless steel 1.4301	PN-EN 10088-1: 2014
17	Gasket	NBR	PN-ISO 1629: 2005
18	O-ring seal	NBR	PN-ISO 1629: 2005
19	Bolt, M3x10-A2	Stainless steel	PN-EN ISO 10642: 2006
20	Bolt, M16x50-A2	Stainless steel	PN-EN ISO 4017: 2011
21	Nut	Stainless steel	PN-EN ISO 4017: 2011
22	Washer	Stainless steel	PN-EN ISO 7091: 2003
23	Ball cock, DN25 PN16		Manufacturer's catalogue
24	Elbow, PVC 6/4"		Manufacturer's catalogue

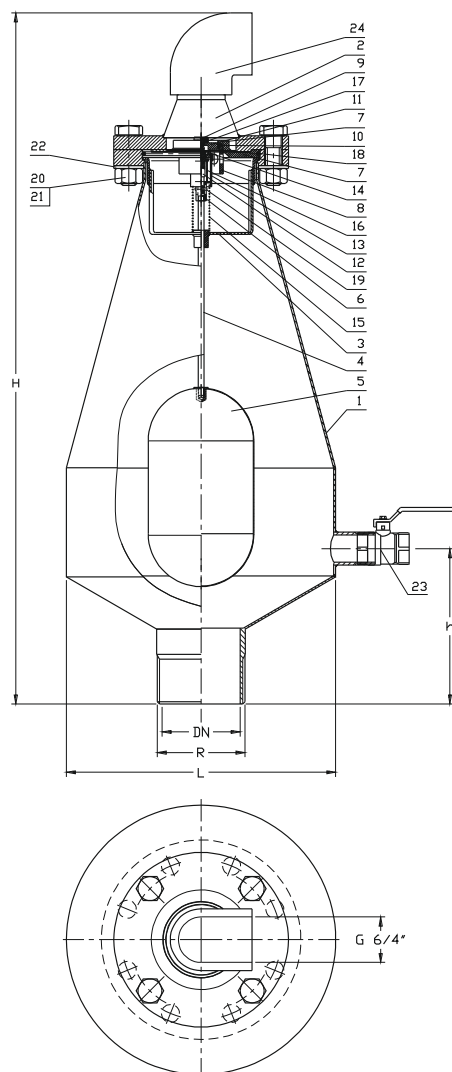
## 2.3 DIMENSIONS

TYPE 7020 – 7025, flanged connection



DN	H	h	L	D	K	Weight
mm						kg
50	690	150	270	165	125	16,0
80				200	160	17,0
100				220	180	18,0
150				285	240	21,0
200				340	295	23,0

TYPE 7020 – 7025, threaded connection



DN	H	h	L	R	Weight
mm					kg
50	690	150	270	2"	15,0
80				3"	16,0

## 2.4 REFERENCE STANDARDS

PN-EN 1074-1: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. General requirements
PN-89/H-02650	Valves and pipelines. Pressure and temperature ratings.
PN-EN 1074-2: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Isolating valves.
PN-EN 1074-4: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Part 4. Air 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 ISO 6708: 1998	Pipework components. Definition and selection of DN (nominal size).
PN-EN 1563: 2012	Founding. Spheroidal graphite cast irons.
PN-EN 1370: 2012	Founding. Surface roughness inspection by visual tactile comparators.
PN-EN ISO 4762: 2006	Hexagon socket head cap screws.
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.
PN-EN 1706: 2011	Aluminium and aluminium alloys. Castings. Chemical composition and mechanical properties.
PN-EN ISO 228-1: 2005	Pipe threads; where pressure-tight joints are not made on the threads. Dimensions, tolerances and designation.
PN-EN ISO 4017: 2011	Hexagon head screws. Product grades A and B.
PN-EN ISO 1872-1:2000	Plastics. Polyethylene (PE) moulding and extrusion materials. Designation system and basis for specifications.
PN-EN 10088-1: 2007	Stainless steels. List of stainless steels.

## 2.5 ORDERING INFORMATION

Type 7020 and 7025 flanged air valves for sewage, 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

Type 7020 and 7025 flanged air valves for sewage, therefore orders must include: are accepted and produced in accordance with PN-EN 1074-4: 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 steel 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**

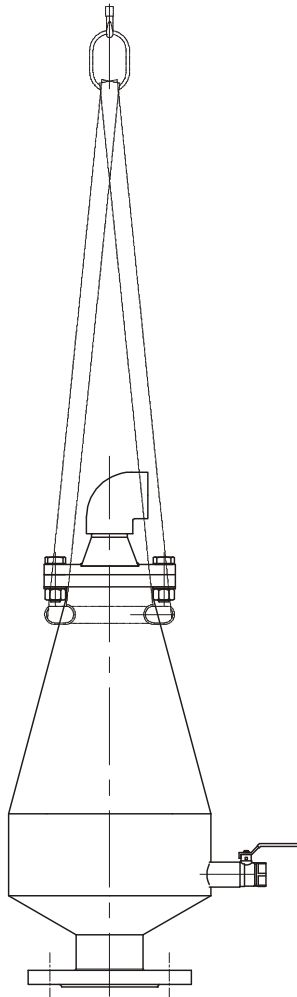
The valve marking is regulated by the following are packed on EURO pallets (1200x800) and protected with heat-shrunk film.

### **3.3 STORAGE**

Store the valve is regulated in sheltered rooms.

### **3.4 TRANSPORT**

Transport The valve is regulated on sheltered vehicles. The following diagram shows an example of vertical handling on belt slings.



The manufacturer recommends slings for transport and installation of valves with the bore size from DN50 to DN200.

## **4 ASSEMBLY AND INSTALLATION**

### **4.1 ASSEMBLY GUIDELINES**

The TYPE 7020 and 7025 flanged steel air valves and can be installed in underground/buried or overground pipelines in horizontal system arrangement. The flanged valves are suitable for joining with the flanged ends of pipelines with the size equal to that of the valve flanges. The DN50 valves also feature a port for threaded connection. Note that the system must not expose the valve to bending or tensile stress from loading with the unsupported pipeline sections. Assemble with consideration to pressure and temperature compensation of the pipeline. Install the valve in an readily accessible location to enable periodic inspections. The threaded outlet opening in the cover is terminated with a 6/4 PVC elbow. The system design must allow openings of sizes which assure unobstructed inlet and outlet of air. Install a protective mesh screen on the outlet tip to prevent ingress of contaminants or insects.

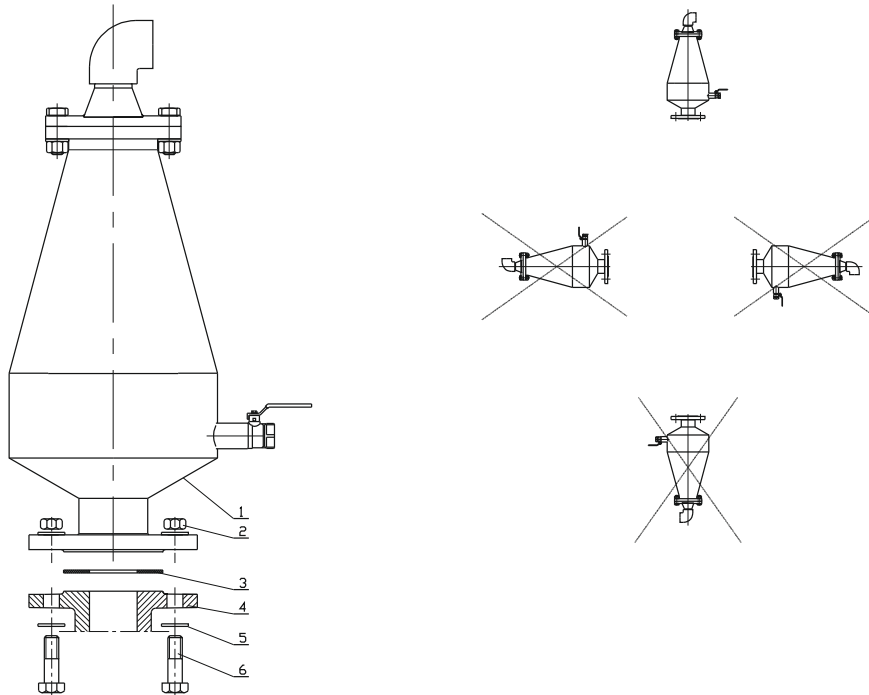
The valve assembled and delivered by the manufacturer is ready for installation. Disassembly of the valve components without proper care may result in loss of integrity.

## 4.2 ASSEMBLY INSTRUCTIONS

Before attempting to install The TYPE 7020 and 7025 flanged steel air valves 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:



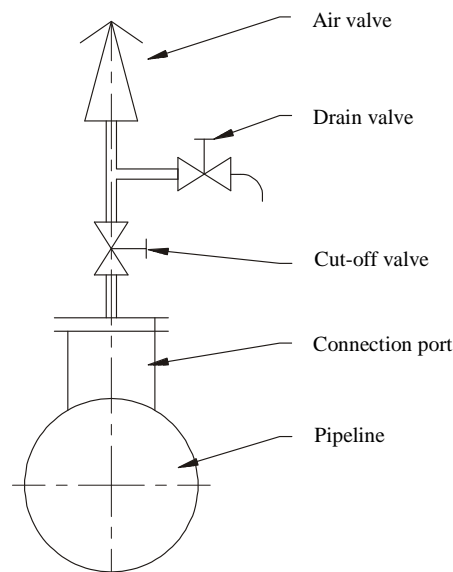
1. Valve; 2. Nut; 3. Gasket; 4. Pipeline flange; 5. Washer; 6. Fastening bolt

The recommended connection method for the air valve is shown in the diagram below.

### 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 connection port (turret) diameter must be adequately large and be at least the size of the air valve. The connection port orientation shall be vertical. The drain valve is intended for manual air relief or aeration, and for depressurizing (by draining) prior to maintenance work. The cut-off valve allows installing and removing the air valve and the drain valve.

**Keep the cut-off valve closed during the system pressure test.**

Flush the system thoroughly before installing the air valve.

#### **4.3 OPERATION**

The TYPE 7020 and 7025 flanged steel air valves shall be operated according to the requirements for air valves, i.e. in the orientation shown in the permitted orientation diagram. It is recommended to periodically purge the valve with fresh water (every three months) to assure full performance. It is also recommended to prevent jamming of the flange and valve stages in the body.

**Caution! The manufacturer highly recommends periodic inspection and maintenance of the air valve (by flusing the unit), which requires decommissioning the product.**

#### **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.