Operation and maintenance manual for

SEWAGE AIR VALVES

P/N 7090

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 structural changes to the presented product.

CONTENTS

1 TECHNICAL DESCRIPTION

1.1 PRODUCT DESIGNATION AND IDENTIFICATION

The subject of this Operation and Maintenance Manual is**:**
the air valve for sewage: **TYPE 7090**, comprising:
– type 7020 valve: carbon steel valve body and cover with epoxy paint coat as an anti-corrosion protection; type 7025: full stainless steel design,
– PP or stainless steel float,
– nuts, washers and bolts (stainless steel) for fastening the body to the cover,
– complete valve well.

1.2 USE

The flanged air valves are intended for venting air from / air intake to sewage pipelines during priming/draining. The valves are intended for underground systems (direct buried installation) and must be installed at the highest elevation point of the horizontal pipeline.

1.3 TECHNICAL SPECIFICATION

The **TYPE 7090** flanged steel air valves are intended for aeration and air venting of pipelines.

– Available diameters (dimensions):	– DN80 [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:	70ºC
– Max. aeration/venting rate, stage 1	190 m^3/h
– Max. venting rate, stage 2	7.5 m^3/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 7080** flanged air 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 vale 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 7090** flanged air valves for sewage.

The essential part of the valve assembly is the Type 7020 or 7025 valve. The valve features 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 pipeline draining, 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.

The **TYPE 7090** valve is housed in a well secured by an access cover on its top.

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

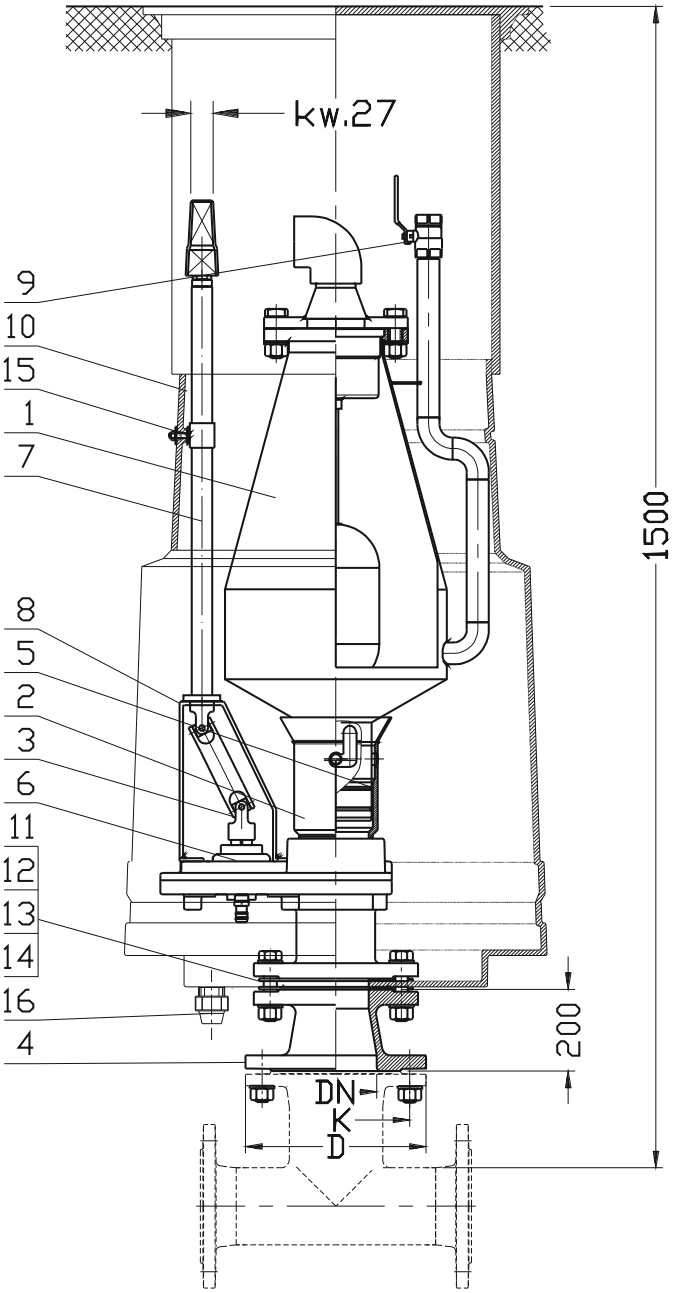
2.2 MATERIALS

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

Item	Part designation	Material	Reference standard
1	Valve, 7020 / 7025	Steel grade 1.0037 Stainless steel, 1.4301	PN-EN 10025-2: 2007 PN-EN 10088-1: 2014
2	Quick-release coupling flange	Steel grade 1.0037 Stainless steel, 1.4301	PN-EN 10088-1: 2014 PN-EN 10025-2: 2007
3	Coupling	Stainless steel, 1.4301	PN-EN 10088-1: 2014
4	Two-flange reducer, FFR, TYPE 9212		Manufacturer's catalogue
5	O-ring seal, 80x4	NBR	PN-ISO 1629: 2005
6	Plate gate		Manufacturer's catalogue
7	Fixed housing, TYPE 9010		Manufacturer's catalogue
8	Coupling rig	Steel grade 1.0037	PN-EN 10025-2: 2007
9	Ball valve, 1"		Manufacturer's catalogue
10	Complete valve well		Manufacturer's catalogue
11	Bolt	Galvanized steel, Fe/Zn5	PN-EN ISO 4017: 2011
12	Nut	Galvanized steel, Fe/Zn5	PN-EN ISO 4017: 2011
13	Washer	Galvanized steel, Fe/Zn5	PN-EN ISO 7091: 2003
14	Flange rubber gasket	NBR	PN-ISO 1629: 2005
15	Handle		Manufacturer's catalogue
16	Plastic connector		Manufacturer's catalogue
17	Adapter and cover, B75		Manufacturer's catalogue

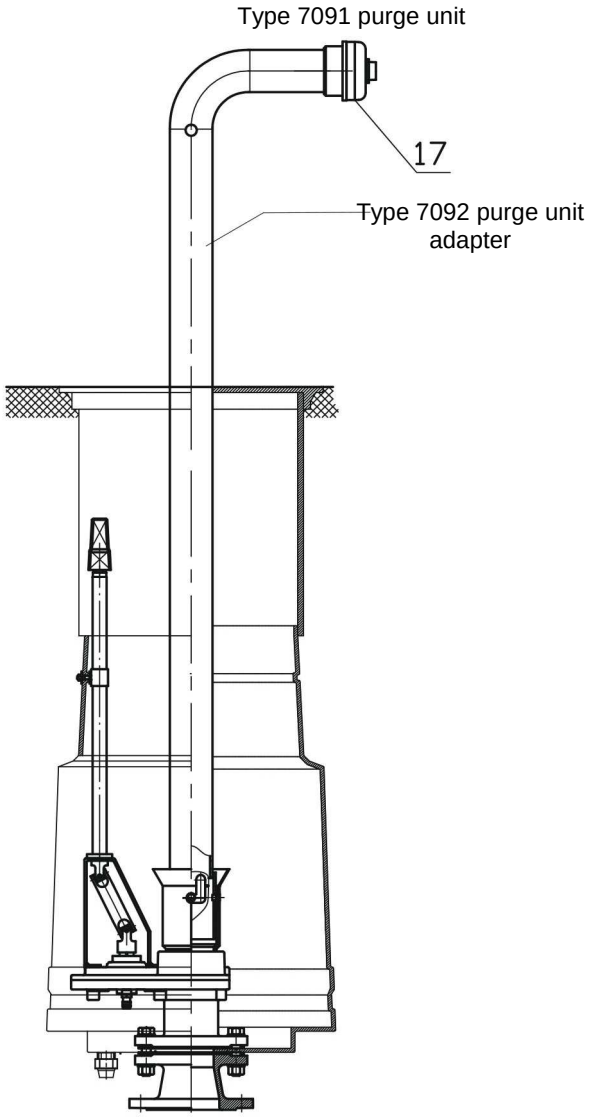
2.3 DIMENSIONS

TYPE 7090 AIR VALVE CONFIGURATION



DN	K	D	Weight
[mm]			[kg]
50	125	165	~60.0
65	145	186	
80	160	200	
100	180	220	
150	240	285	

The system for flushing the installation with the purge unit is shown in the figure below. (The unit is available from the Jafar Product Range.)



Using the purge unit: replace the Type 7020/7025 valve from the **TYPE 7090** air valve with the purge unit.

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 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 1561: 2012	Founding. Grey cast irons.
PN-EN 1562: 2012	Founding. Malleable cast iron.
PN-EN 1563: 2012	Founding. Spheroidal graphite cast irons.
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 1706: 2011	Aluminium and aluminium alloys. Castings. Chemical composition and mechanical properties.
PN-ISO 1629: 2005	Rubbers and latices. Nomenclature.
PN-EN 1092-2: 1999	Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges.
PN-EN 10226-1: 2006	Pipe threads where pressure tight joints are made on the threads – Part 1: Taper external threads and parallel internal threads.
PN-EN ISO 4017: 2011	Hexagon head screws. Product grades A and B.
PN-EN ISO 4762: 2006	Hexagon socket head cap screws.
PN-EN ISO 1873-1:2000	Plastics. Polypropylene (PP) moulding and extrusion materials. Designation system and basis for specifications.
PN-EN ISO 1874-1: 2004	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 and sewage valves are special purpose valves; please specify the following in your order:
– part number (P/N, equal to the product type)
– intended use , e.g. for water supply (or sewage) 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
– maximum operating temperature, acc. to PN-89/H-02650

2.6 PRODUCTION AND ACCEPTANCE

The **TYPE 7090** air valves are manufactured and accepted according to PN-EN 1074-4: 2002 (Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Part 4. Air valves) and PN-EN 12266-1: 2012 (Industrial valves. Testing of valves). All valves (100%) are subject to tightness testing. The test includes the outer body integrity and the valve closure integrity at low and high pressures, and valve operation efficiency.

2.7 MARKINGS

The valve marking is regulated by the following standards: PN-EN 19: 2005, PN-EN-1074-1: 2002.

The valve bodies have markings placed on the front and rear chamber walls which include the following data:
– nominal diameter
– nominal pressure
– body material type
– manufacturer's brand mark

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,

– construction mark "B" and/or mark "CE" (as applicable),
– product type.

3 PROTECTION, STORAGE & TRANSPORT

3.1 PROTECTIVE COATINGS

All inner and outer carbon 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 250 μm.
The part surfaces are 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 1.4301 (stainless steel) or Fe/Zn5 (galvanized steel).

3.2 PACKAGING

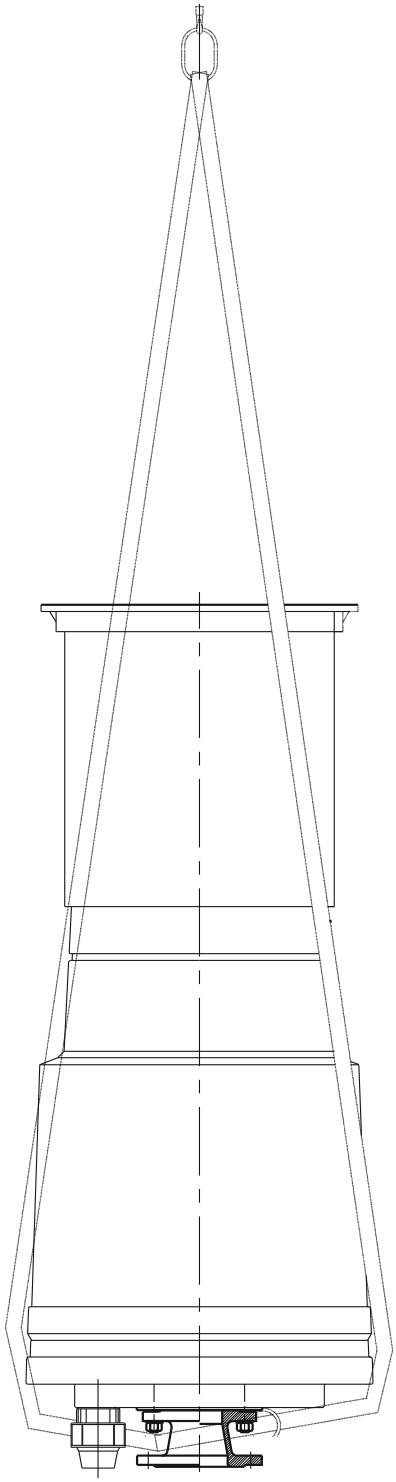
TYPE 7090 flanged air valves are packed on EURO pallets (1200x800) and protected with heat-shrunk film.

3.3 STORAGE

Store the **TYPE 7090** flanged air valves in sheltered rooms.

3.4 TRANSPORT

Transport the **TYPE 7090** flanged air valves
on sheltered vehicles.



The manufacturer recommends slings for installation of the **TYPE 7090** valve.

4 ASSEMBLY AND INSTALLATION

4.1 ASSEMBLY GUIDELINES

The **TYPE 7090** air valves are installed in underground horizontal pipelines.

The **TYPE 7090** 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.

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.

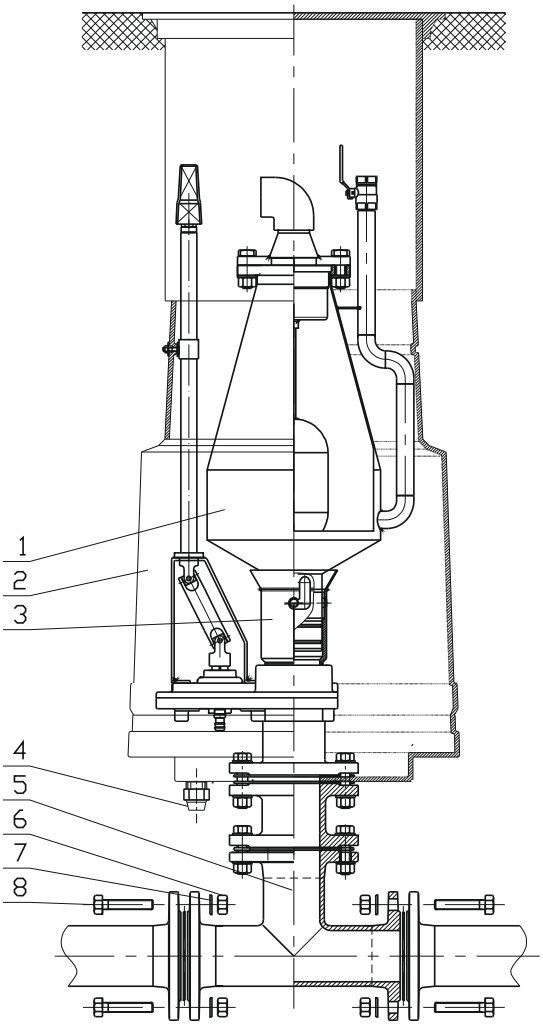
4.2 ASSEMBLY INSTRUCTIONS

Before attempting to assemble the valve, check the technical and commercial documents for compliance of the valve with order and its intended medium and operating parameters of the pipeline in which the valve is to be installed. 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.

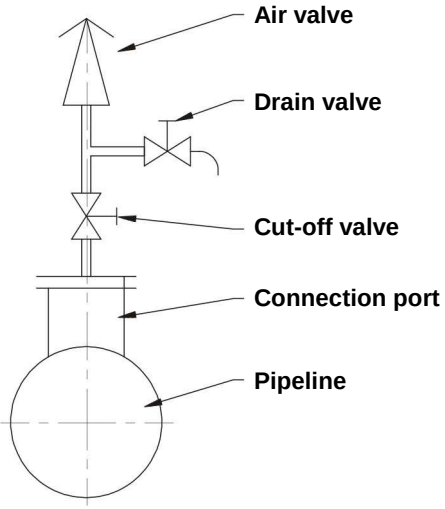
Caution! If the product has mechanical damage, do not install it in the pipeline.

The assembly method is shown in the following figure:



1. – Valve, type 7020 (or 7025); 2. – Well; 3. – QR coupling flange; 4. – Plastic connector; 5. – Tee; 6. – Nut; 7. – Washer; 8. – Bolt.

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



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 7090** 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 and to prevent jamming of the float and the component valves inside the air valve body.

Caution! The manufacturer highly recommends periodic inspection and maintenance of the air valve. This requires removing the valve from service.
Flush the valves periodically with clean water.
Flushing procedure:

1. Close the cut-off valves
2. Open the drain valves
3. Turn the valve counter-clockwise
4. Pull the valve up from the quick-release coupling
5. Attach a water supply hose to the valve outlet port
6. Flush the valve with clean water
7. Prepare the valve for reassembly in the shielding pipe
8. New o-ring seals (5) are recommended for reassembly
9. Lubricate the o-ring seals with e.g. petrolatum before assembly
10. Insert the valve into the quick-release coupling
11. Turn the valve clockwise
12. Close the drain valves
13. Open the cut-off valves

4.4 OCCUPATIONAL HEALTH AND SAFETY

The Type 7090 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 conditions and period of the warranty is specified in the warranty sheet.