Operation and maintenance manual for

AIR VALVES FOR WATER AND SEWAGE SYSTEMS

Catalogue no. 7010, 7040, 7050

Approved for use by

President of Factory, JAFAR S.A.

User's failure to follow the instructions and guidelines included in this operation and maintenance manual exempts the manufacturer of all obligations and warranty.

Due to continuous business development, we reserve the right to introduce modifications and structural changes to the presented product.

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1 TECHNICAL DESCRIPTION

1.1 PRODUCT NAME AND FEATURES

The purpose of this TED are air valves for water systems.

TYPE 7010

-single step cast iron air valve for water systems, flanged
- with a floating ball (closing device) vulcanised in 100% with an elastomer
- with an o-ring cover gasket
- with screws which connect the cover with the body.

TYPE 7040

-single step brass air valve for water systems, threaded
- stainless steel with a floating ball
- with an o-ring cover gasket

TYPE 7050

- two step air valve for water systems which comprises valves 7010 and 7040.

1.2 PURPOSE

Flanged cast iron and brass threaded air valves are intended to deaerate the pipe system when it is filled with water or to aerate the pipe system when it is emptied in potable water systems and industrial systems. They can be used in above ground and underground systems, essentially in the highest point of horizontally placed piping.

1.3 TECHNICAL SPECIFICATION

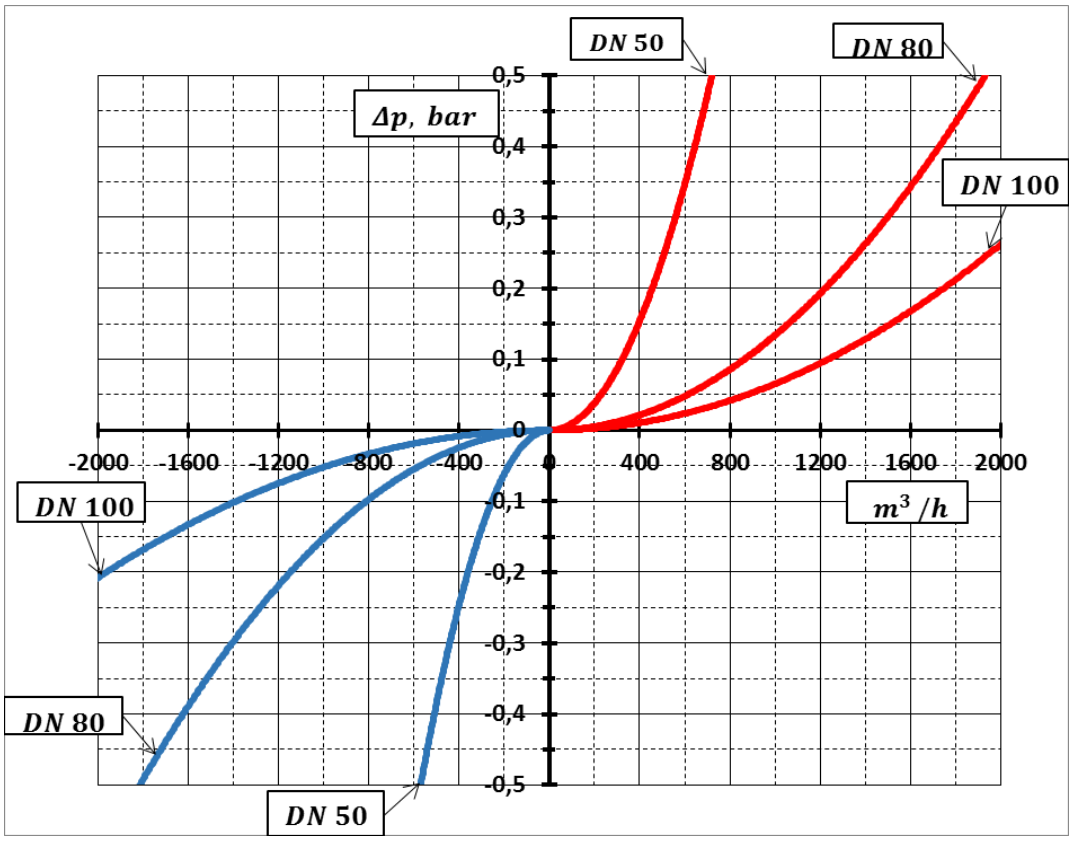
Cast iron air valves TYPE 7010 are intended for purposes of aerating and deaerating systems for potable water and other liquids (obtain agreement from the producer):

- operation temperature ranges from	-10°C to +70°C.
- range of used diameters (dimensions):	- DN50 –DN200[mm];
- max flow speed of medium	- liquid up to 4[m/s];
	- gas up to 15[m/s];
- nominal pressure value:	- PN: - 1,6 MPa;
- operational pressure range:	- 0,02 – 1,6MPa;

Flanges at valves TYPE 7010 are made according to PN-EN 1092-2 1999 with dimensions appropriate to the assumed nominal pressures.

Dimensions of flanged air valves TYPE 7010 comply with the technical documentation. Choice of TYPE 7010 valves is carried out regarding the amount of supplied (returned) air, which involves the pipeline diameter and the length of the deaerated section. When filling the pipeline, maximum flow speed in an unobstructed cross-section should not exceed 20 m/s, so that the ball is not carried away and the flow is not closed before the deaerating process is finished.

When filling the pipeline, the whole of deaerating cross-section of a valve is available.



Zawór 7010 DN50, DN80, DN100

Przepływ maksymalny zaworu 7010

DN	Q_{max}, m^3/h
50	1182
80	2498
100	5601

2 STRUCTURE

2.1 FITTING STRUCTURE DESCRIPTION

F.A. „JAFAR" S.A manufactures cast iron, flanged air valves TYPE 7010 for potable water and industrial systems. They have a cast iron body which houses a loose ball, which is a closing component (float). The ball is made of metal insert fully covered with a rubber layer. The ball is able to float when the valve is filled with water because it has lower density than water. Ball density is chosen so that during air release via the valve, the ball is positioned in the lower part of the body, and during water filling raised together with the water level. After the chamber has been filled with water, the ball is positioned in the valve nest in its upper part and closes the flow.

However, during the aerating the ball, as the water level in the valve chamber decreases, initially assumes position at the ledges in the lower part, not closing the air flow to the pipeline.

The body chamber is covered with a cast iron cover, caulked with an o-ring gasket, connected with the body with hex head screws screwed into the body. All the internal and external cast iron

surfaces of the valve are covered with powder epoxy paint.
In the cover flange opening there is an access plug with a ¾" thread, which makes it possible to twist the TYPE 7040 deaerating valve, which is intended to release small quantities of air.

TYPE 7040 valve is a single step valve for water systems, which is made of a brass body 1 and cover 2 connected with a thread by means of an o-ring gasket 10. A metal ball – a float 3 with density lower than water is suspended from a stainless steel lever 6. The lever has a movable joint 7 with a bolt 8, which is a lever spin axis mounted to the lower cover surface. Ball density is especially chosen so that during air release via the valve, the ball is positioned in the lower position (descended lever) and during water filling raised together with the water level. Filling the chamber with water causes a simultaneous movement of the lever according to spin axis until it reaches the upper position, where gasket 4 closes the output hole of a nozzle 5.

However, during the aerating the ball, as the water level in the valve chamber decreases, the nozzle output hole opens and assumes the lower position in the position of descended lever.

During work with a TYPE 7010 valve, the TYPE 7040 valve is a second stage of deaerating when the ball performs repetitive up and down movements, releasing small amounts of air, which builds up in the chamber through the half-open nozzle, with 7010 valve still closed and filled with water (under pressure).

It is recommended to install the air valve in vertical position in the highest point of the pipeline or in its inflection points.

2.2 MATERIALS

Tables below show a list of materials used in the production of air valves.

TYPE 7010

No.	Part name	Material	Standard
1	Body	Ductile cast iron EN-GJS-400-15	PN-EN 1563: 2012
2	Cover	Ductile cast iron EN-GJS-400-15	PN-EN 1563: 2012
3	Vulcanised ball	Aluminium alloy covered with rubber: EPDM (or NBR)	PN-EN 1706: 2011 PN-ISO 1629: 2005
4	Caulk ring	Rubber: EPDM (or NBR)	PN-ISO 1629: 2005
5	Caulk ring	Rubber: EPDM (or NBR)	PN-ISO 1629: 2005
6	Hex head screw M16x40	Acc. to subject matter standards	PN-EN ISO 4017: 2011
7	Rootstock 17	Acc. to subject matter standards	PN-EN ISO 7091: 2003
8	Plug ¾"	Brass/chrome plated	acc. to the producer's Technological Guidelines

TYPE 7040

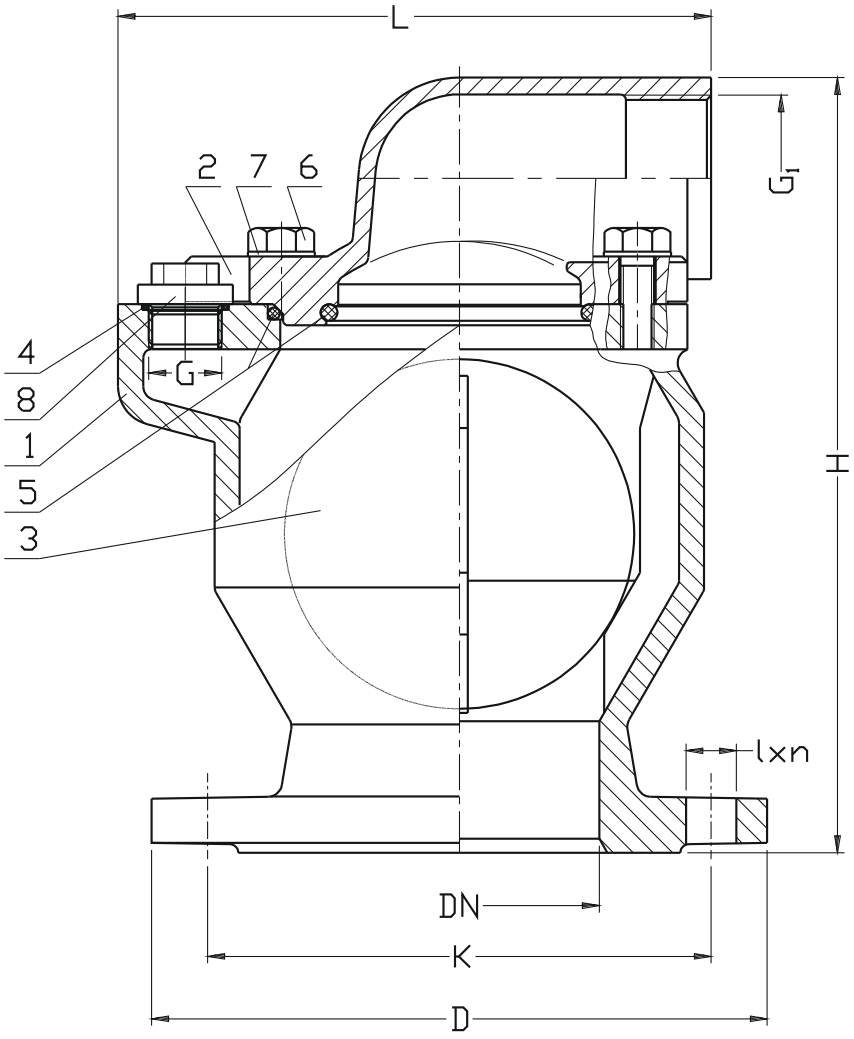
No.	Part name	Material	Standard
1	Body	Brass CuZn39Pb1Al-B	PN-EN 1982: 2010
2	Cover	Brass CuZn39Pb1Al-B	PN-EN 1982: 2010
3	Float	Stainless steel 1.4301	PN-EN 10088-1: 2014
4	Gasket	Rubber EPDM/NBR	PN-ISO1629: 2005
5	Nozzle	Stainless steel 1.4301	PN-EN 10088-1: 2014
6	Lower lever	Stainless steel 1.4021	PN-EN 10088-1: 2014
7	Top Lever	Stainless steel 1.4021	PN-EN 10088-1: 2014
8	Bolt	Stainless steel 1.4301	PN-EN 10088-1: 2014
9	Caulk ring	Rubber EPDM/NBR	PN-ISO1629: 2005
10	Screw	Stainless steel	PN-EN ISO 4017: 2011

TYPE 7050

No.	Part name	Material	Standard
1	7010 valve	Like in the table for 7010	Like in the table for 7010
2	7040 valve	Like in the table for 7040	Like in the table for 7040

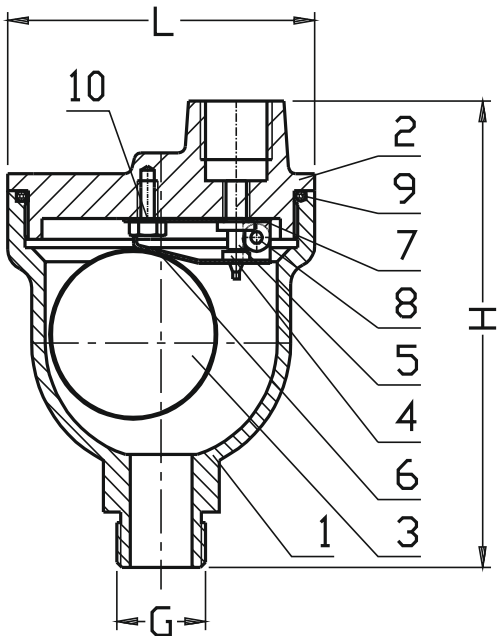
2.3 DIMENSIONS

TYPE 7010



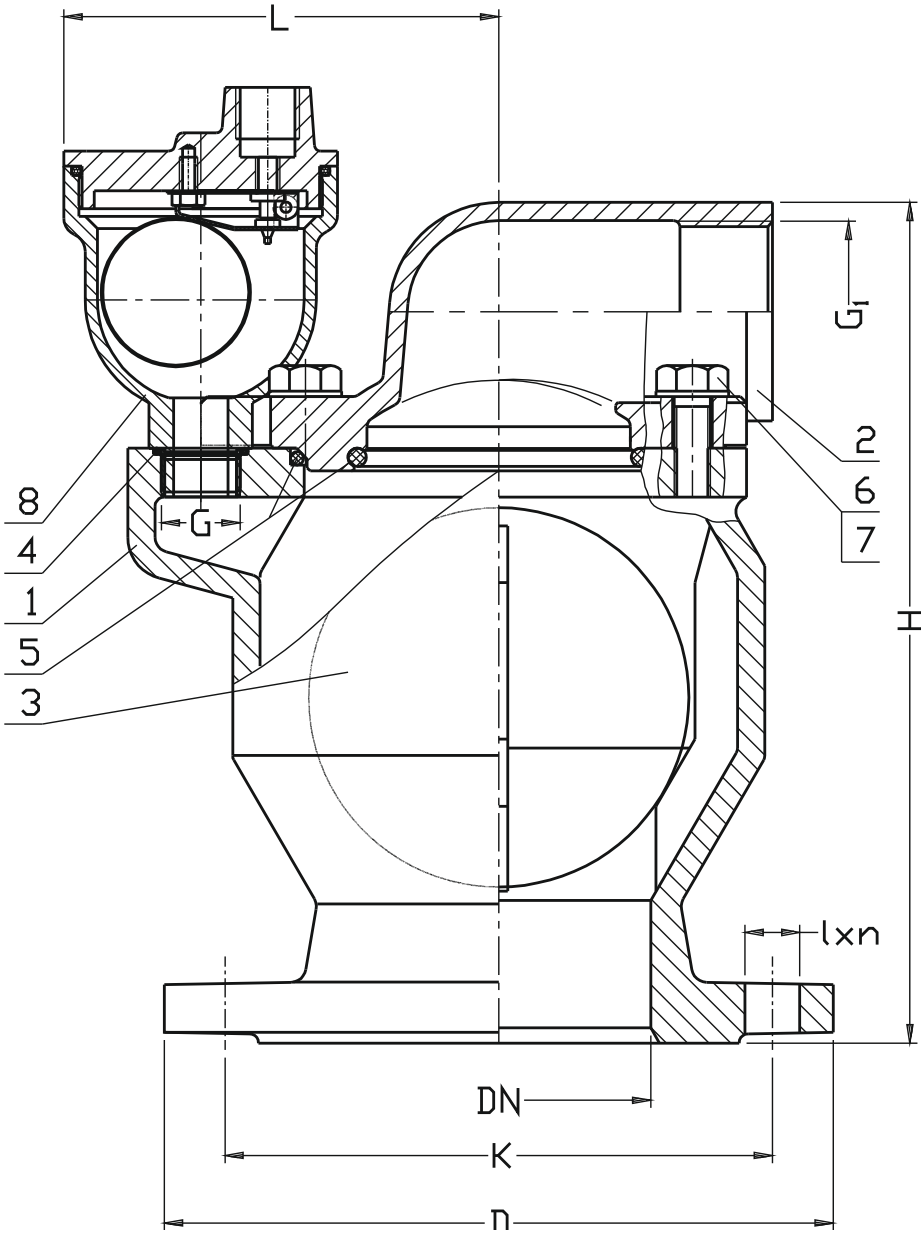
DN	H	L	D	K	l x n	G	G_1	Masa
[mm]						[cal]		[kg]
50 / GW 2"	187	156	165	125	19x4	3/4"	5/4"	7
80	242	195	200	160	19x8(4)*		2"	14
100	319	195	220	180	19x8		2"	18
150	350	265	285	240	23x8		3"	33
200	350	270	340	295	23x8(12)*		3"	34

TYPE 7040



G	H	L	Masa
[cal]	[mm]		[kg]
3/4"	135	85	1,6
1"			1,7
5/4"			1,7
6/4"			1,8

TYPE 7050



DN	H	L	D	K	l x n	G	G_1	Masa
[mm]						[cal]		[kg]
50 / GW 2"	250	108	165	125	19x4	3/4"	5/4"	8,5
80	280	128	200	160	19x8(4)*		2"	15,5
100	316	141	220	180	19x8		2"	19,5
150	355	173	285	240	23x8		2"	34,5
200	355	173	340	295	23x8(12)*		3"	35,6

2.4 STANDARDS

PN-ISO 1629: 2005	Rubbers latex Nomenclature.
PN-89/H-02650	Fittings and pipelines. Pressures and temperatures.
PN-EN ISO 228-1: 2005	Pipe threads where pressure-tight joints are not made on the threads Dimensions, tolerances and designation.
PN-EN 10226-1: 2006	Pipe threads where pressure-tight joints are made on the threads. Dimensions, tolerances and designation.
PN-EN ISO 6708: 1998	Definition and selection of DN /nominal size/
PN-EN 1092-2: 1999	Flanges and their joints circular flanges for pipes, valves, fittings and accessories Cast iron flanges.
PN-EN 1561: 2012	Founding. Grey cast iron.
PN-EN 1563: 2012	Founding. Nodular cast iron
PN-EN 1074-1: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. General requirements.
PN-EN 1074-4: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Part 4 Air valves.
PN-EN 1706: 2001	Aluminium and aluminium alloys. Castings. Chemical composition and mechanical properties.
PN-EN 12266-1: 2003	Industrial valves Testing of valves.
PN-EN 10088-1: 2007	Stainless steels. List of stainless steels.
PN-EN ISO 12944-5: 2001	Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Protective paint systems
PN-EN 19: 2005	Industrial valves. Marking of metallic valves.
PN-EN ISO 4017: 2011	Hexagon head screws. Product grades A and B

2.5 ORDERING PRINCIPLES

Cast iron flange valves Type 7110, typ 7050 and threded Typ 7040 for special purposes, which is why the following details should be provided in the order:

- catalogue no. (constitutes product type),
- intended use, e.g. potable water,

additionally

- nominal diameter acc. to PN-EN ISO 6708: 1998;
- nominal pressure acc. to PN-89/H – 02650;
- body material type – e.g. grey cast iron acc. to PN-EN 1561: 2012;
- max operational temperature acc. to PN-89/H – 02650;

2.6 MANUFACTURE AND ACCEPTANCE

Cast iron flange valves Type 7110, typ 7050 and threded Typ 7040 are manufactured and commissioned 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: 2003 (Industrial valves. Testing of valves). All valves (100%) are tested for sealability. Outer body sealability is tested and closed sealability in low and high pressure.

2.7 MARKING

Valve marking is governed by standards: PN-EN-19: 2005, PN-EN-1074-1: 2002.

Valve bodies have markings placed on the front and back wall of the chamber body, which include the following data:

- nominal diameter
- nominal pressure
- type of body material
- producer trade mark

and a ledge to include an identification mark (e.g. series no.)

3 PROTECTION — STORAGE — TRANSPORTATION

3.1 PROTECTIVE COATINGS

All internal and external cast iron surfaces are protected with epoxy paint, applied electrostatically. The paint is approved for contact with food products.

The thickness of the anti-corrosion coating layer is min. 250 μm.

Mould surface is prepared for the application of the epoxy coating in accordance with the technical documentation and PN-EN ISO 12944-5: 2009.

The screws connecting the body and the cover are manufactured as stainless, grade OH18N9 or Fe/Zn5 (galvanised steel).

3.2 PACKAGING

Cast iron flange valves TYPE 7010, TYPE 7050 and threaded TYPE 7040 are packaged on EURO pallets (1200x800) and secured with a heat shrinked hood.

3.3 STORAGE

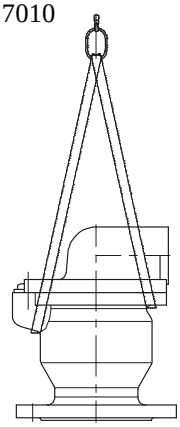
Cast iron flange valves TYPE 7010, TYPE 7050 and threaded TYPE 7040 should be stored indoors.

3.4 TRANSPORTATION

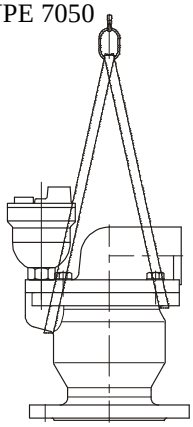
Cast iron flange valves TYPE 7010, TYPE 7050 and threaded TYPE 7040 should be transported by covered means of transport.

The producer recommends using a lifting sling from DN100 to DN200.

TYPE 7010



TYPE 7050



4 ASSEMBLY AND INSTALLATION

4.1 INSTALLATION GUIDELINES

Cast iron flange valves TYPE 7010, TYPE 7050 and threaded TYPE 7040 can be built over in underground pipelines and above ground vertical systems. Flange valves are adapted to be fitted with pipeline stub pipe flanges with dimensions corresponding with the valve flanges. Valves sized DN50 additionally have a terminal which enables a threaded connection. During fitting, make sure that the installation in progress does not cause the fittings (valve) to be stressed with bending or stretching force resulting from mass of an unsupported pipeline. It is recommended to carry out installation works taking into account pipeline compensation for temperature and pressure. Valves should be installed in easily accessible places which enable regular controls with scheduled frequency. Correctly sized holes should be provided in the installation design to ensure uninterrupted air flow in both sides. As small amounts of water may escape with the air, a method of its drainage should be provided as well (e.g. sewage grate). Threaded G_1 output hole in the cover enables the installation of a bend or a pipe which makes it possible to direct water spatter in the direction of a sink. It is recommended to put a security net on the output end to prevent the entry of contamination or small insects.

The valve, after assembly and delivery by the producer is ready to be installed in the system. Works connected with disassembly of valve elements carried out without due care may cause it to lose its sealability.

4.2 INSTALLATION INSTRUCTION

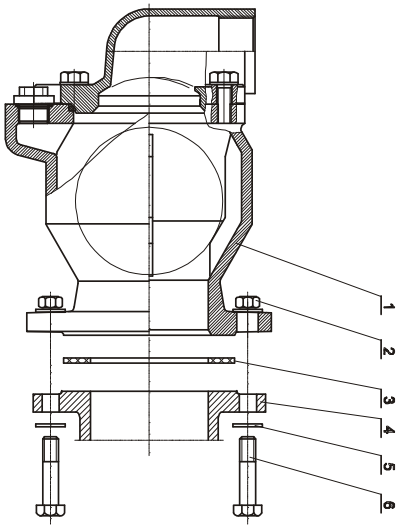
When attempting installation of fittings, one should check the technical and commercial documentation, that is the compliance of installed valve with the order and its intended use for media and the working parameters of the pipeline it is to be installed. Each change of operation conditions requires consultation with the fittings' producer.

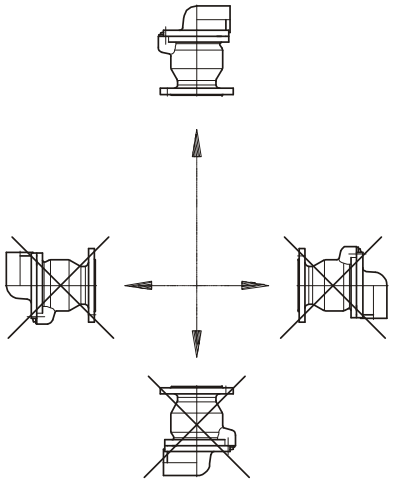
Before attempting the installation, pipe stoppers should be removed from the main tunnel, state of external surfaces should be checked and, if necessary, rinse them thoroughly with water.

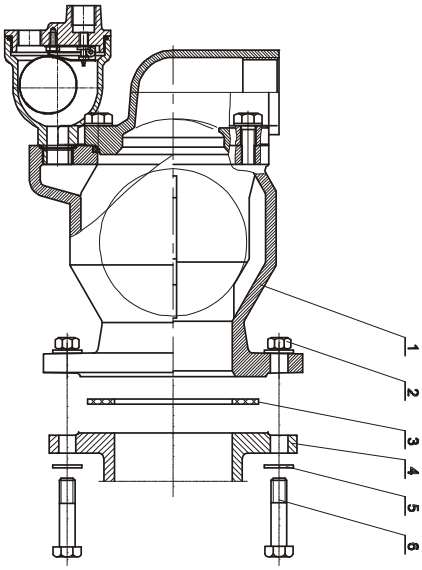
Attention! In case of mechanical damage, the device should not be installed on the pipeline.

The picture below shows how to install the valve.

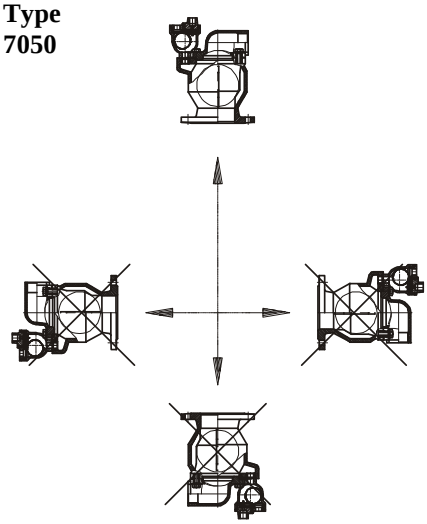
Type7010





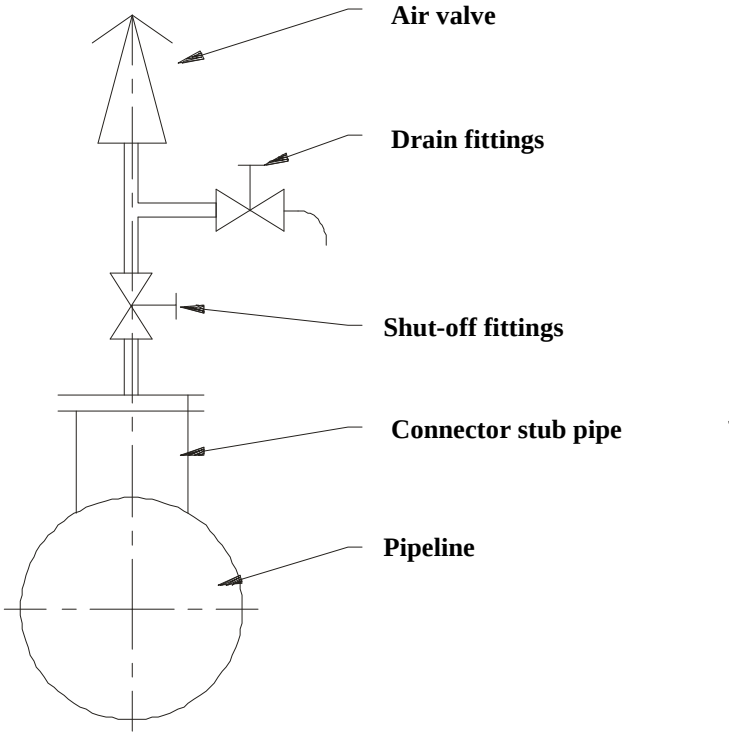


Type 7050



1.-valve, 2.-nut, 3.-gasket, 4.-pipeline flange, 5.-washer 6.-assembly screw

Recommended method of connecting the air valve is presented in the diagram below.



Terminal diameter (tower) should be large enough and correspond at least to the air valve size. The terminal should be positioned vertically. The drain valve is used to manually aerate and deaerate as well as to reduce pressure (by release) before the maintenance works begin. Shut-off fittings make it possible to install and disassemble the air valve as well as the drain valve.

During the system pressure test, the shut-off fittings should remain closed.

Before installing the air valve, the system should be rinsed.

4.3 OPERATION

Cast iron flange valves TYPE 7010, TYPE 7050 and threaded TYPE 7040 should be operated according to the requirements regarding the air fittings, i.e. oriented as shown in the diagram of possible orientations. In order to provide full operational efficiency, rinsing valves with clean water is recommended (once a year). In order to protect the ball (floater) from blocking inside the body or damaging the ball rubber cover, it is recommended to separate hard solid particles larger than 5mm from the medium.

4.4 H&S REGULATIONS

Guidelines and recommendation from the OHS regulations apply, regarding the pipeline systems and devices installed in pipeline stations, heat power stations, water treatment plants, sewage treatment plants, pumping stations and other objects, as well as the ordinance regarding general OHS regulations (using hand protection, leg protection, head protection and protective clothing), especially when working exposed to low or high temperatures.

Product operation out of their intended use is not allowed.

5 WARRANTY CONDITIONS

The manufacturer grants warranty for the product being installed and operated according to this OMM. The conditions and period of the warranty is specified in the warranty sheet.