



CSA products for treated water

Equilibrium ball float valve

Mod. Athena (DN 50-65)

Introduction

This manual will provide you with the information to properly install and maintain CSA float valves ATHENA. The contents and the procedure are intended for technicians in charge of CSA valves only, prior to a theoretical and practical training by CSA qualified or authorized personnel.

Safety

All safety messages in the instruction manual are flagged with the following symbol meaning danger, caution and warning. This means and makes reference to procedures that may lead to equipment and system damage and to severe injury or death for the personnel involved.



WARNING!

Personnel involved in the installation or maintenance of valves should always be alert to potential emission of water and pipeline material, and take the necessary safety precautions. Always wear the suitable protection like helmets, gloves, googles, when dealing and handling hazardous pipelines and valves.

Inspection

Your valve ATHENA has been packaged to provide protection during shipment, however it can be damaged during transport. Please carefully inspect the unit for damages or discrepancies with the order upon arrival and report a claim immediately before unloading the goods.

Parts

Recommended spare parts are listed on the assembly drawing depicted on page 7. These parts should be stocked to minimize delays in case of malfunction. When ordering spare parts please make reference to the assembly drawing and identification plate present on the valve.

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Description

The automatic ATHENA consists of a upstream pressure balanced single seat float valve, piston actuated and equipped with a float sensing the level inside the tank and imparting the movement to the mobile block. The float and its rod, entirely made in stainless steel, are connected to the piston by means of a single lever produced in double galvanized or stainless steel to avoid corrosion. ATHENA automatically interrupts or modulates the water supply, in accordance to the demand out of the tank, in order to maintain the water level within the range of the valve's opening stroke. The special design allows for a globe or angle pattern configuration without changing the valve, whose piston features the exclusive self-cleaning technology to prevent dirt from collecting on the rings thus minimizing the risk of friction and malfunctioning.



WARNING!

Personnel involved in the installation or maintenance of valves should be constantly alert to possible damages caused by an improper handling of the valve.

Handling and Storage

Lifting the valve improperly may damage it. Lift the valve with slings, chains or cables fastened around the valve body or eyebolts if present, or fastened to bolts or rods through bolt holes in the flanges. Do never lift the valve by the levers, pivots. If installation will be delayed, place valve indoors in secure, weather tight storage. If temporary outside storage is unavoidable, make sure a vermin proof rain cover is secured around/over the valve to keep off rain and mud. Skid and set the assembly on a flat, solid, and well drained surface for protection from ground moisture, runoff and pooled rain water. Do not leave the valve exposed to high humidity and excessive temperature conditions.

Fusion/Powder Coated Valves



CAUTION!

Valves with fusion/powder coated exterior paint require flat washers to be installed under the flange nuts when installing the valve to the pipeline flange, to prevent the paint from cracking or chipping.

Installation

The float valve should always be installed in a horizontal position, meaning the axis of the valve versus the ground level. The valve has to be installed between two sectioning devices, one upstream and one downstream to allow for maintenance, with a filter upstream of it to prevent dirt from creating malfunctioning. ATHENA doesn't require any pressure to work, and performances are not affected by the upstream pressure variations thanks to the upstream pressure balanced piston technology.



WARNING!

The difference in pressure generated by the valve when closed or during closing will produce a thrust proportional to the pressure itself.

Anchorage blocks and way of preventing valve's movement or shifting need to be taken into account.

- Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the pipeline.
- Prepare pipe ends and install valves in accordance with the pipe manufacture's instructions for the joint used.
- Tighten the flange bolts or studs in a crisscross pattern and minimum of four stages.
- Place the valve in the right direction following the arrow moulded on the body
- If not included in the order install a pressure gauge upstream to check the maximum static pressure reached during closing and make sure it doesn't exceed the valve's design pressure



WARNING!

During discharge the valve will produce a water outflow proportional to the difference in pressure, when tank outflow is normally under gravity conditions. User should take that into account during sizing and installation.

- **Note to Engineer:** The automatic level float valve ATHENA can work for long time within a small opening % and/or be subject to frequent opening and closing cycles. That depends on the volume of the tank to be controlled and inlet pressure variations. Should the latter exceed 7 bar, both in static and during modulation, we recommend to contact us for further analysis as high pressure ratio and frequent operating cycles may lead to cavitation and consequent damages to the valve's body and internal parts.

Set up

- Before the start-up of the valve make sure the instructions provided on the maintenance section “Installation” on page 5 were properly followed and understood.
- Operate very slowly on the following procedure to avoid stresses on the valve and unexpected pressure surges.
- The valve is initially isolated from the main line by means of the sectioning devices upstream and downstream.
- Open the upstream gate valve by 30%, then open slowly the downstream sectioning device to generate some flow through the valve. Make sure the maximum nominal pressure is not exceeded during this operation
- If possible act manually on the float's arm, to simulate opening and closing, and make sure ATHENA will respond to the movement of the lever without any friction and further issues.
- Open completely the upstream gate valve.
- Let ATHENA work and modulate according to the demand of the tank and the variation of the water level inside of it.
- Allow for enough time for the system to balance, with a pressure gauge upstream make sure that the flow rate doesn't rise above the recommended limit and that the difference in pressure, in static and dynamic conditions, remains below 7 bar.



WARNING!

When the valve opens, in response to the variation of water level inside the tank, the water discharged and the pressure variation of the supply line can be substantial. In case of high differential pressure and flow rate values operate slowly if acting manually on the levers, this is to avoid water hammer phenomena. Same thing applies in case of small tanks when the water level variations occurs rapidly.

Maintenance

The float valve ATHENA is sturdy and reliable, and it was designed to minimize maintenance. A semi-annual visual inspection for the proper movement of the levers and movement of the piston is recommended. A routine maintenance for gasket, control, rings and if needed replacements is recommended every 4 years and explained on page 7 (ref. picture 1 on page 8). A possible malfunction can be identified by a leakage through the seat, normally caused by dirt accumulated inside the body, unwanted opening or closing in case of friction affecting the proper movement of levers and mobile block.

Disassembly

In order to carry out the proper maintenance of ATHENA proceed as follows, ref picture 1 on page 7, for further info consult spare parts breakdown on page :

1. slowly close the upstream and downstream gate valves;
2. if ATHENA is installed on top of the riser, or in a location not suitable for maintenance, please remove it from the pipe;

3. remove the screw (10) and take out the float and its rod (11 and 9) from the lever 7
4. keeping the shaft pivot (6) fixed unscrew the nut (12) below it
5. remove the pivots with elastic pins (8) connecting the levers to the shaft pivot (6) and upper coupling (5) then take out the lever (7)
6. remove the upper coupling (5) and unscrew the shaft pivot (6) and do not remove, unless strictly required, the lower coupling (4) set tight to the cap (2) by means of a screw (3)
7. extract the cap (2) including upper coupling (4)
8. keeping the nut (33) set tight unscrew the lower tightening or locking nut (23)
9. extract from the top the piston with shaft (18 and 16), check the status of the o-ring (18) between the shaft and the piston, remaining of water on the upper part of the piston where the nut (33) is located may indicate damages to the o-ring, and check the guiding ring (25). The latter has only the purpose of adding an extra guiding point to the piston's movement and doesn't involve any water tight seal
10. extract from below or from the downstream side the obturator block (19-20-21)), check for the o-ring (31) and if needed replace it
11. check the plane gasket (20) and make sure there are not visible signs of erosion, wearing, incisions. Replace it if necessary
12. check the surface of the sealing seat (22) to make sure there are not visible signs of wearing, incision, erosion. Replace it if necessary
check the surface of the guiding bush 817) for possible layers of dirt, accumulations, as well as the proper status of the lip gasket (24)
13. The water tightness between the body (1) and the guiding bush (20) is ensured by means of an o-ring (30)
14. Should we need to take out the guiding bush (20) the valve has to be rotated with the cover facing downwards, by means of a plastic rubber or round corners wooden wedge exert some force to pull it out paying attention not to damage any surface, components and gaskets.

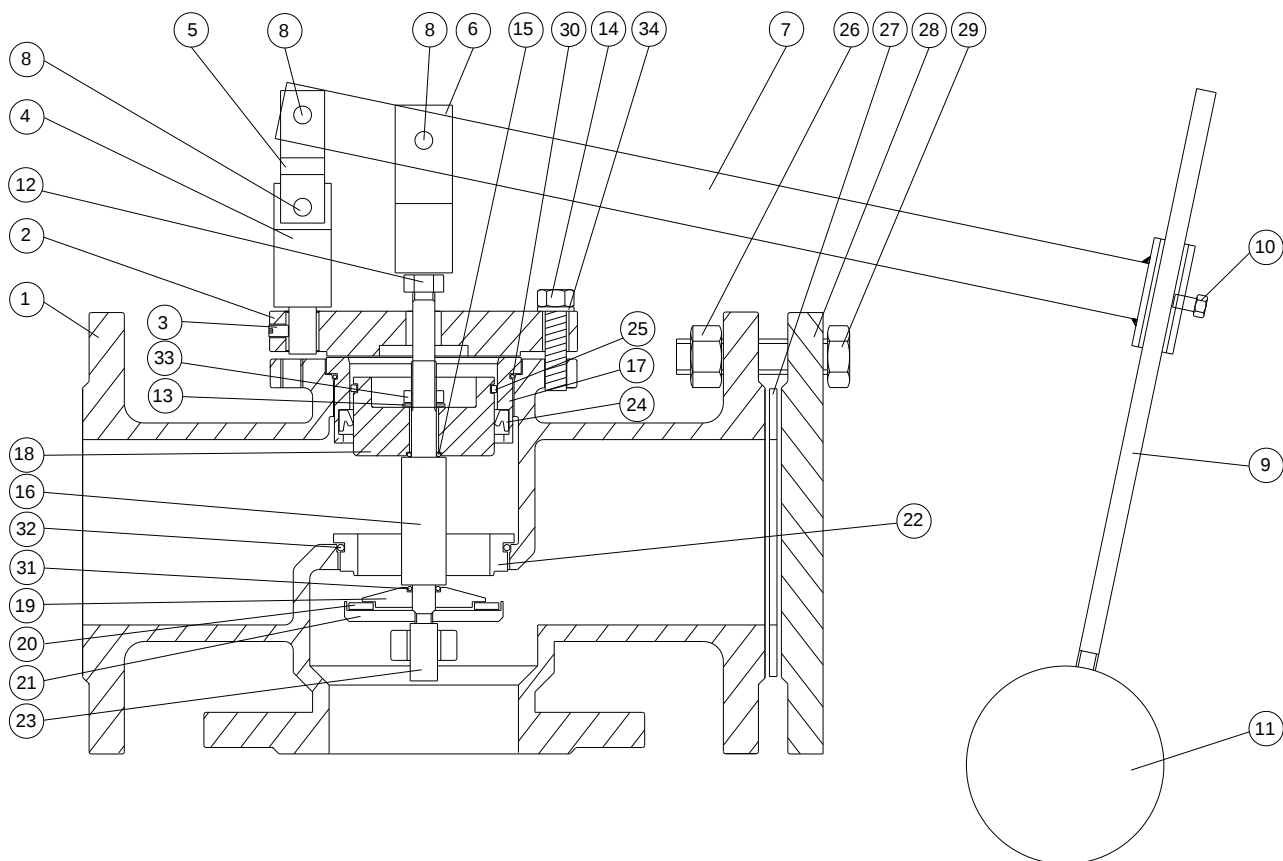
Reassembly

In order to carry out the proper reassembly of ATHENA follow the instruction explained above on in reverse order paying attention to:

- 1) use a proper grease on the guiding bush, o-ring, lip gaskets to allow for the proper movement of the mobile block.
- 2) when connecting the mobile block (composed of piston and shaft) to the tightening nut (26) do it unscrewing the latter using an average Loctite (normally 50) and not too strong.
- 3) make sure when setting the nut (15) that the ATHENA has the levers aligned horizontally in the closed position

Contact us for further assistance.

Drawings



N.	Component	Material	N.	Component	Material
1	Body	GJS 500-7 or GJS 450-10	18	Piston	AISI 303/AISI 316
2	Cap	painted steel	19	Counter-seat	AISI 303/AISI 304/AISI 316
3	Screw	AISI 304/AISI 316	20	Plane gasket	NBR/polyurethane
4	Lower coupling	zinc-plated steel/AISI 316	21	Obturator	AISI 303/AISI 316
5	Upper coupling	zinc-plated steel/AISI 316	22	Seat	AISI 304/AISI 316
6	Shaft pivot	zinc-plated steel/AISI 316	23	Tightening nut	AISI 303/AISI 316
7	Lever	zinc-plated steel/AISI 316	24	DI gasket	NBR/EPDM/Viton
8	Pivots with pins	AISI 303	25	Guiding ring	PTFE
9	Float rod	AISI 304/AISI 316	26	Nuts	AISI 304/AISI 316
10	TE screw	AISI 304/AISI 316	27	Plane gasket	Nylon reinforced rubber
11	Float	AISI 304/AISI 316	28	Blind flange	painted steel
12	Nut	AISI 304/AISI 316	29	TE screws	AISI 304/AISI 316
13	Washer	AISI 304/AISI 316	30	O-ring	NBR/EPDM/Viton
14	Screws	AISI 304/AISI 316	31	O-ring	NBR/EPDM/Viton
15	O-ring	NBR/EPDM/Viton	32	O-ring	NBR/EPDM/Viton
16	Shaft	AISI 303/AISI 316	33	Nut	AISI 304/AISI 316
17	Guiding bushing	bronze/AISI 304/AISI 316	34	Washers	AISI 304/AISI 316
Spare parts: 15-20-24-25-27-30-31-32					

Problems solving

Problem	Cause	Solution
Valve leaks at flange joint	Loose flange bolting.	Tighten flange bolting.
	Blown flange gasket.	Replace flange gasket.
	Miss-alignment or damage to field piping and supports.	Adjust miss-alignment or repair piping or supports.
	Damaged flange face/s or improper flange connections.	Repair flange, replace valve body or adjust flange connections.
The valve doesn't close	The water level hasn't reached the max level	Check if the water level inside the tank
	There is dirt accumulated between the obturator and the seat	Remove the valve and clean it inside to remove dirt
	There is dirt causing friction to the lever during their movement	Check the movement of the lever on the pivots and coupling
	The plane gasket of the obturator/ seat and / body is damaged due cavitation and the valve can't assure a watertight sealing any more	Check the difference in pressure, operating cycles of the valve, flow rate. Make sure they don't exceed the advised values from our technical literature
	The float is corroded and filled with water, causing the loss of buoyancy	Check for the presence of sea water and aggressive substances and contact us, float and other internals components can be manufactured in different materials
The valve doesn't open	The water level hasn't dropped below the max level	Check if there is demand out of the tank and the water level inside
	There is dirt accumulated between the obturator and the body	Remove the valve and clean it inside to remove dirt
	There is dirt causing friction to the lever during their movement	Check the movement of the lever on the pivots and coupling



We reserve the right to incorporate our latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only.

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