CSA products for treated water

Equilibrium float valve

Mod. Athena (DN 250-300)

Rev. 2 – 3/2015

Introduction

This manual will provide you with the information to properly install and maintain CSA float valves ATHENA DN 250/300. 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. Spare parts breakdown is on page 12.These parts should be stocked to minimize delays in case of malfunction. All CSA products and spare parts can be supplied by CSA official distributors or directly from CSA. When ordering spare parts please make reference to the assembly drawing and indentification plate present on the valve.

CSA Service

CSA service personnel are highly qualified to maintain and repair all CSA products, CSA also offers customized training program and consultation services.
For more information please contact CSA or visit the web site www.csasrl.it constantly updated.

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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 levers 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 of CSA 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 CSA as high pressure ratio and frequent operating cycles may lead to cavitation and consequent damages to the valve's body and internal parts and therefore a pressure reduction system could be recommended.
- Always use a stilling tank if available or a conveyance pipe to avoid turbulence and splashing on the float during discharge.

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 (10) ref picture 1 on page 7. 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.

Set up

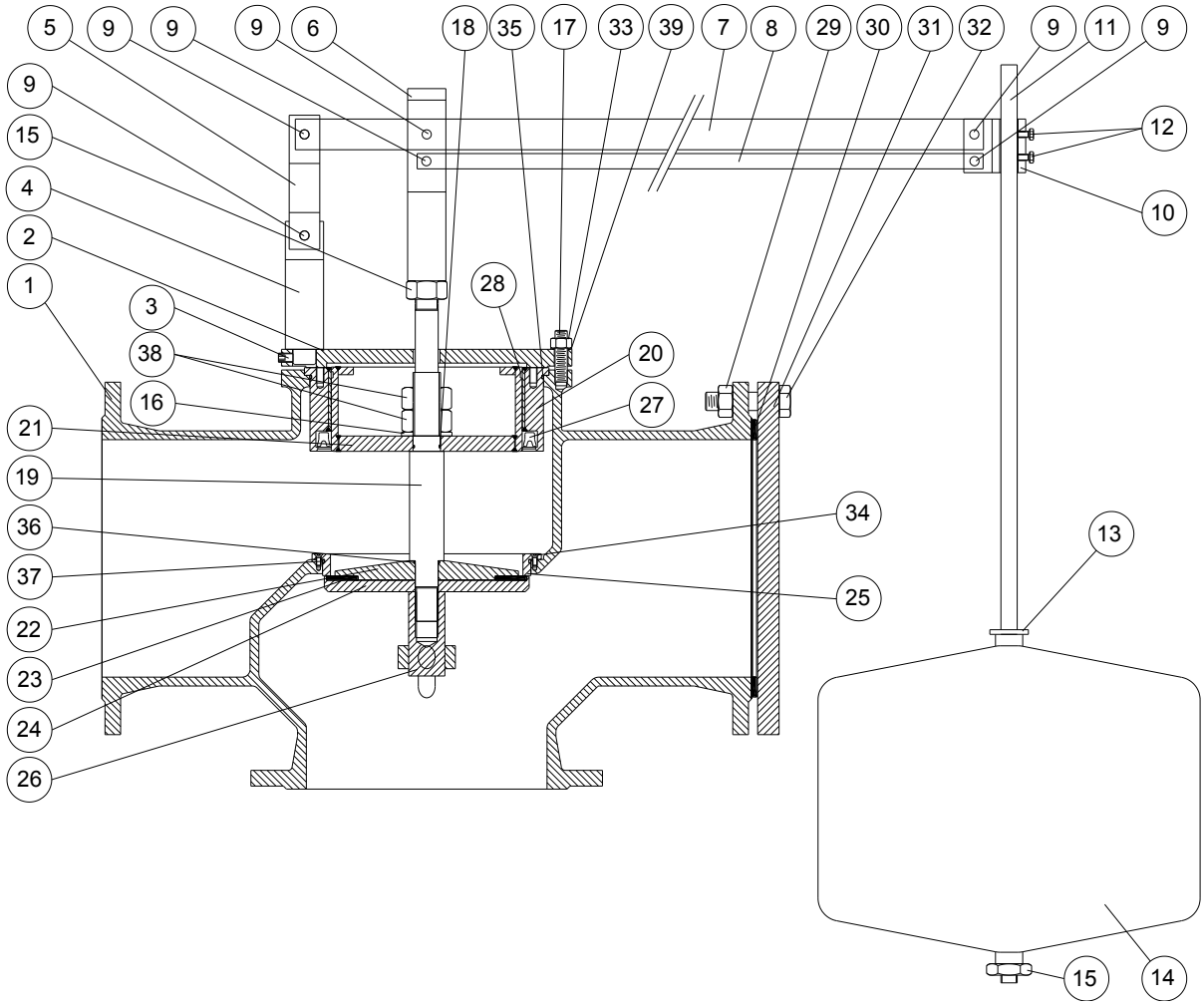
- Before the start-up of the valve make sure the instructions provided on the maintenance section “Installation” on page 5 were properly followed and understood.
- Operate very slowly on the following procedure to avoid stresses on the valve and unexpected pressure surges.
- The valve is initially isolated 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, to simulate opening and closing, and make sure ATHENA will respond with a smooth movements of levers 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 both the flow rate and difference in pressure in static and dynamic condition doesn’t go above the recommended limit for cavitation damage(7 bar) and maximum recommended flow rate. Should the static pressure be excessive pressure reducers are advised and contact CSA for further support.

WARNING!

When the valve opens, in response to the variation of water level inside the tank, the water discharged 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.

Drawings

Picture 1 ATHENA DN 250/300



N.	Component	Material	N.	Component	Material
1	Body	GJS 500-7/GJS 450-10	21	Piston	AISI 303/AISI 316
2	Cap	painted steel Fe 37	22	Counter-seat	painted steel Fe 37
3	Screw	AISI 304/AISI 316	23	Plane gasket	NBR/polyurethane
4	Lower coupling	zinc-plated Fe 37/AISI 316	24	Obturator	AISI 304/AISI 316
5	Upper coupling	zinc-plated Fe 37/AISI 316	25	Seat	AISI 304/AISI 316
6	Shaft pivot	zinc-plated Fe 37/AISI 316	26	Tightnening nut	AISI 303/AISI 316
7	Upper lever	zinc-plated Fe 37/AISI 316	27	DI gasket	NBR/EPDM/Viton
8	Lower lever	zinc-plated Fe 37/AISI 316	28	Guiding ring	PTFE
9	Pivots with pins	AISI 303	29	Nut	AISI 304/AISI 316
10	Float coupling	zinc-plated Fe 37/AISI 316	30	Plane gasket	Nylon reinforced rubber
11	Float rod	AISI 304/AISI 316	31	Blind flange	painted steel Fe 37
12	TE screw	AISI 304/AISI 316	32	TE screw	AISI 304/AISI 316
13	Elastic pin	AISI 304/AISI 316	33	Nut	AISI 304/AISI 316
14	Float	AISI 304/AISI 316	34	TPSEI screw	AISI 304/AISI 316
15	Nut	AISI 304/AISI 316	35	O-ring	NBR/EPDM/Viton
16	Washer	AISI 304/AISI 316	36	O-ring	NBR/EPDM/Viton
17	Studs	AISI 304/AISI 316	37	O-ring	NBR/EPDM/Viton
18	O-ring	NBR/EPDM/Viton	38	Nuts	AISI 304/AISI 316
19	Shaft	AISI 303/AISI 316	39	Washer	AISI 304/AISI 316
20	Guiding bushing	painted steel Fe 37/AISI 316	Spare parts: 18-23-27-30-35-36-37		

Spare parts: n. 18-23-27-28-30.

Troubleshooting

Condition	Possible Cause	Corrective Action
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.

Problems solving (ref drawing 1 on page 7)

Problem	Cause	Solution
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 (24) and the seat (25)	Remove the valve and clean it inside to remove dirt
	There is dirt causing friction to the levers during their movement	Check the movement of the levers on the pivots and coupling manually, make sure no dirt or foreign material has gathered on the sliding surfaces
	The plane gasket of the obturator (23) 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 CSA technical literature
	The float(14) is corroded and filled with water, causing the loss of buoyancy	Check for the presence of sea water and aggressive substances and contact CSA, float and other internals components can be manufactured in different materials
The valve doesn't open	The water level hasn't reached the minimum level	Check if there is demand out of the tank and the water level inside
	There is dirt accumulated between the obturator (24) and the body in particular on the lower guidance point (26)	Remove the valve and clean it inside to remove dirt
	There is dirt causing friction to the levers during their movement	Check the movement of the levers on the pivots and coupling

1) Disassembly

In order to carry out the proper maintenance of ATHENA proceed as follows, ref drawing picture 1 on page 7:

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 screws (12) and take out the float and its rod (11 and 14) from the levers (do not separate the float from the rod unless it is strictly necessary);
4. inspect the float surface (14) looking for possible signs of erosion, deformations
5. keeping the shaft pivot (6) firmly secured unscrew the nut (15) underneath
6. remove the cotter pins on each pivots (9) and pull out the levers (7 and 8)
7. remove the shaft pivot (6) , and the upper coupling (5)
8. do not remove, unless strictly required, the lower coupling (4) set tight to the cap (2) by means of a screw (3)
9. remove the nuts (33) and washers (39)
10. pull out the cap (2) including the lower coupling (4)
11. keeping the nut (15) set tight unscrew the lower tightening or locking nut (26)
12. remove the nuts (38) and inspect the status of the o.ring (18)
13. extract from the top the piston with shaft (21 and 19)
14. remove the guiding bush (20) , in case of difficulties exert some vibrations by means of a plastic or rubber coated hammer or the upper surface, paying attention not to create any damage or deformations to the components and gaskets (35)
15. check the status of the lip gasket (27) and the guiding ring (28)
16. the lip gasket (27) is extremely important both for the water tightness and self cleaning system preventing dirt from gathering during working conditions, the guiding ring in PTFE will deform in response to variation in temperature and will guarantee for the proper movement of the piston
17. extract the obturator block (22-23-24) and check the plane gasket (23) making sure there are not visible signs of erosion, wearing, incisions. Pay attention not to damage the o.ring (36) Replace it if necessary
18. Check the surface of the sealing seat (25) to avoid possible wearing, incision, erosion. Replace it if necessary

1) Reassembly

In order to carry out the proper reassembly of ATHENA follow the instruction explained on page 10 in reverse. Pay attention to:

1) use am insoluble grease in water on the guiding bush, o-ring, lip gaskets to allow for the proper movement of the moving parts
2) When connecting the mobile block (composed of piston and shaft) to the tightening nut (26) use a thread locker with average resistance (CSA is using LOCTITE 50)
3) Make sure when setting the nut (15) that ATHENA has the levers aligned horizontally in the closed position

Contact CSA for further assistance

Guarantee

Products, auxiliaries and parts thereof of CSA srl manufacture are warranted to the original purchaser for a period of twelve (12) months from date of shipment from factory, against defective workmanship and material, but only if properly installed, operated and serviced in accordance with CSA srl recommendations. Repair or replacement, at our option, for items of CSA srl manufacture will be made free of charge, (FOB) our facility with removal, transportation and installation at your cost, if proved to be defective within such time, and this is your sole remedy with respect to such products. No claim for transportation, labor or special or consequential damages or any other loss, cost or damage shall be allowed. You shall be solely responsible for determining suitability for use and in no event shall CSA srl. be liable in this respect. CSA srl does not guarantee resistance to corrosion, erosion, abrasion or other sources of failure, nor does CSA srl guarantee a minimum length of service. Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than CSA srl. or its authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to install and operate said products and parts according to instructions furnished by CSA srl or misuse, modification, abuse or alteration of such product, accident, fire, flood or other Act of God, or failure to pay entire contract price when due shall be a waiver by you of all rights under this warranty.

The foregoing guarantee shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to, an actuator is attached to the item by anyone other than CSA srl. factory Service personnel. All orders accepted shall be deemed accepted subject to CSA srl warranty terms and conditions.

Limitation of liability

LIMITATION OF LIABILITY: IN NO EVENT SHALL CSA srl BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, AND CSA srl LIABILITY, UNDER NO CIRCUMSTANCES, WILL EXCEED THE CONTRACT PRICE FOR THE GOODS AND/OR SERVICES FOR WHICH LIABILITY IS CLAIMED. ANY ACTION BY YOU FOR BREACH OF CONTRACT MUST BE COMMENCED WITHIN 12 MONTHS AFTER THE DATE OF SALE.

Sales and Service

For information about our service, approvals, certifications:

Web site: www.csasrl.it E-Mail : info@csasrl.it

CSA srl Inc. reserves 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.