Installation, Operation & Maintenance

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A.R.I. S-050

Automatic Air Release Valve

The following is a step by step narrated description of the A.R.I. S-050 Automatic Air Release Valve installation, operation and maintenance processes.

A.R.I. S-050 Automatic Air Release Valve releases accumulated air from the system while it is under pressure. Please consult Aquestia for the pressure and temperature framework of this model specifications table and for other products designed for hazardous liquids systems.

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Disclaimer

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1. Safety Instructions

Safety Instructions - General

1. Aquestia products always operate as components in a larger system. It is essential for the system designers, installers, operators and maintenance personnel to comply with all the relevant safety standards.
2. Installation, operation or maintenance of the product should be done only by qualified workers, technicians and/or contractors using only good engineering practices, complying with and observing all conventional safety instructions in order to minimize risk and/or danger and/or hazard to workers, the public or to property in the vicinity in accordance with all relevant local standards.
3. Extra safety considerations should be taken with hot and hazardous liquids or in hazardous environments' applications to avoid bodily/physical harm and damage to public or private property.
4. All individuals installing operating and/or handling the products including all workers should at all times adhere to the occupational safety and health (OSH) instructions and wear safety helmets, goggles, gloves, and any other personal safety equipment required by the local standards and regulations.
5. Use only appropriate standard tools and equipment operated by qualified operators when installing, operating and maintaining the product.
6. Prior to installation, operation, maintenance or any other type of action carried out on the product, read carefully the safety, installation and operation instructions of the product.
7. Please note:
   - Pressurized fluid and/or gas may be discharged from the product without prior warning. Make sure that the product's outlet port is not directed toward electrical elements (pumps) or people.
   - The pressurized fluid and/or gas that can be discharged from the product may create high noise levels. Take this into consideration when installing the product in areas sensitive to noise.
8. Always open and close valves slowly and gradually.
9. Please note that the maximum working pressure indicated at the product's specifications table doesn't include pressure changes caused by water hammer and pressure surge effects. Use the product only according to its designated pressure rate specifications.
10. Use the product only for its intended use as designed by Aquestia. Any misuse of the product may lead to undesired damages and may affect your warranty coverage. Please consult with Aquestia prior to any non-regular use of this product and make no change or modification to the product without a prior written consent to be provided by Aquestia at Aquestia's sole discretion.
11. Please note that Aquestia shall NOT assume any liability with respect to any damage losses and/or expenses caused to any person and/or property whatsoever unless the product has been duly installed and thereafter maintained in strict compliance with its designated maintenance Instructions and/or any other installation and operation manuals provided by Aquestia for the product and/or applicable ordinances and/or codes.

Safety Instructions - Handling

1. Shipping and handling the product must be done in a safe and stable manner and in accordance with the relevant standards and regulations.
2. Storage should be in the original delivery crates or cases. Storage should be off the ground in a clean, dry indoor area.
3. For lifting and positioning the product, use only approved lifting equipment operated by authorized employees and contractors.
4. Prior to the installation visually verify that the product was not damaged during shipment to the installation site.

Safety Instructions - Installation

1. Install the product according to the detailed Installation Instructions provided with it by Aquestia and according to the description given in this manual.
2. The user should install a manual Isolation Valve under the product's inlet port.
3. In all installation sites, the user should enable good visibility and verify that the work and auxiliary equipment used are done in accordance with the relevant local authorized standards. Extra safety considerations should be taken on hazardous environment sites.
4. Check and re-tighten the bolts connecting the product to the pipeline during commissioning and before operating the product for the first time.

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Safety Instructions - Commissioning and Operation

1. Read carefully the operation instructions prior to any attempt to operate the product.
2. Observe the safety stickers on the product and never perform any operation contradicting the instructions given.
3. In order to achieve maximum performance and smooth operation of the product, it is crucial to perform the startup and first operation procedures exactly as described in this manual.
4. In cases where formal commissioning procedure is required, it should be done by an authorized Aquestia technician prior to the first operation of the product.

Safety Instructions - Maintenance

Before any maintenance or non-regular operation, please read the following:

1. Servicing the product should be done only by qualified technicians for this type of work.
2. Make sure that you know the exact type of the system fluid. Act accordingly and comply with all the relevant standards and regulations set for handling this type of fluid.
3. Before disconnecting the product from the system and before releasing the residual pressure do NOT:
   - loosen or unscrew the product bolts;
   - remove any protection cover;
   - open any service port.
4. Before any maintenance or non-regular operation, shut off the Isolation valve and release the residual pressure:
   A. For air valves with a pressure release outlet, slowly open the pressure release plug or the ball valve and make sure that all pressure is released. Please note that some air release valves, especially the waste water models, may contain a significant volume of compressed gas with accumulated energy!
   B. For air valves without a pressure release outlet, slowly unscrew the flange bolts until all the pressure is released from the valve.
5. Make sure the air valve is empty of all liquid prior to commencing maintenance.
6. Remove the product from the line only after ensuring that internal pressure has been released.
7. Place warning signs around the work area as required by the local standards and procedures.
8. Inspect the product's safety stickers and replace any damaged or faded sticker.
9. Manual cleaning of the product and/or its components using high water pressure or steam should be performed in accordance with its specific cleaning instructions, the local standards and regulations and without endangering the operator or the vicinity
10. Manual cleaning of product and/or its components using acid or other chemical agents should be performed in accordance with the specific cleaning instructions, the relevant safety instructions for using that chemical as given by its supplier, the local standards and regulations and without endangering the operator or his vicinity.
11. For products used in potable water systems, if it is required to disinfect the product, do so according to the local water authority standards and regulations before putting the product into service.

Safety Instructions - Before returning to regular operation

1. Re-assemble any protection covers or protection mechanisms removed during service or maintenance operations.
2. Make sure that all the tools, ladders, lifting devices, etc. used during the maintenance procedures are taken away from the product area and stored.
3. Remove grease and fat material residues in order to avoid slipping.
4. In order to return the product to regular operation, follow the First Start-up Operation instructions as detailed in your user manual.

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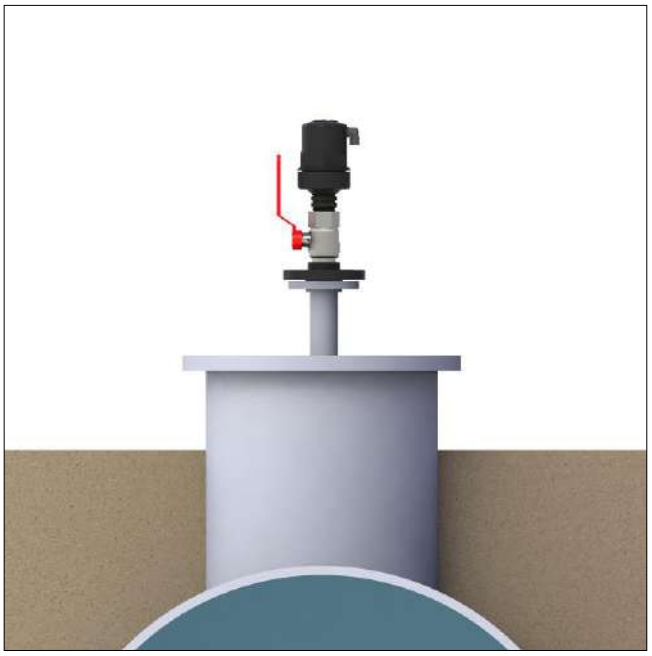
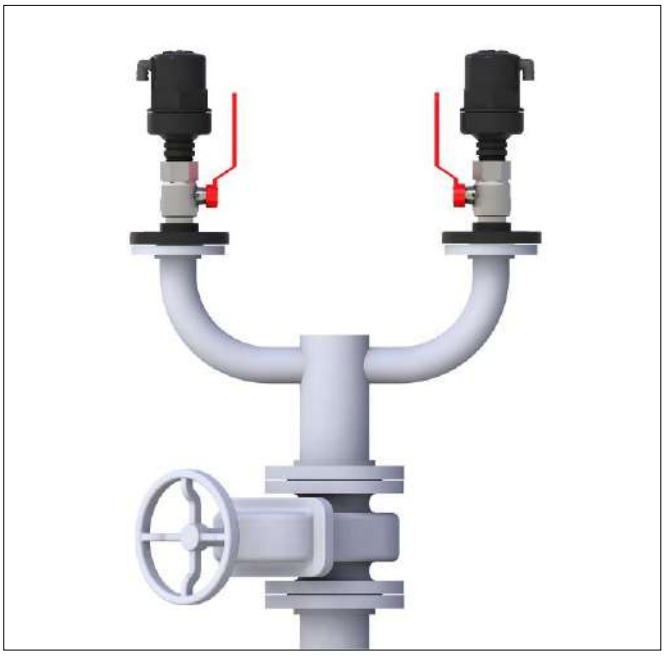
2. Installation

Important: Before performing any work on the air valve make sure that all workers on site are familiar with the safety instructions and the relevant local and general safety instructions and work regulations.

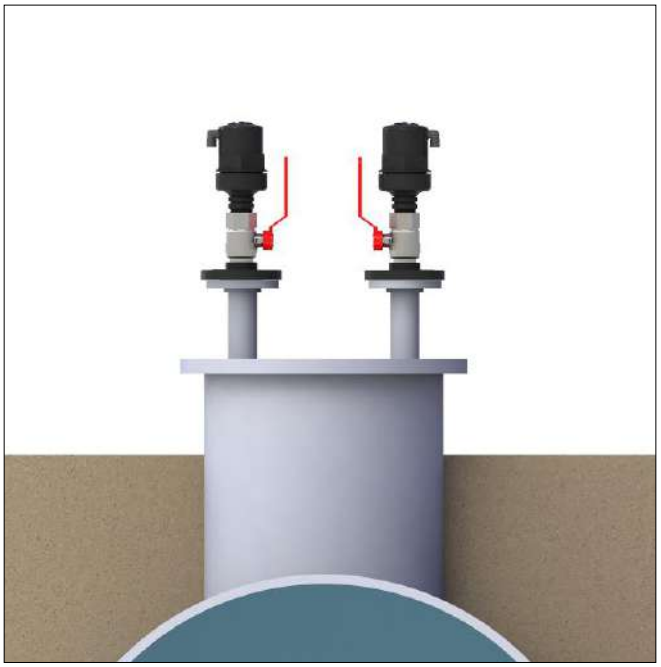
2.1. Installation Recommendations



Single Air Valve on an Isolating Valve at 45° to Air Valve outlet



Two Air Valves on a shared Isolating Valve. Air Valves outlets face outward and the Isolating Valve at 45° to Air Valve outlets



Two Air Valves on an Air Trap with separate Isolating Valves. Air Valve outlets face outward and the Isolating Valves at 45° to Air Valve outlets

Underground Installations

- Underground installations require a venting pipe from the manhole
- Use an angular installation to bypass an obstacle directly above the pipeline.

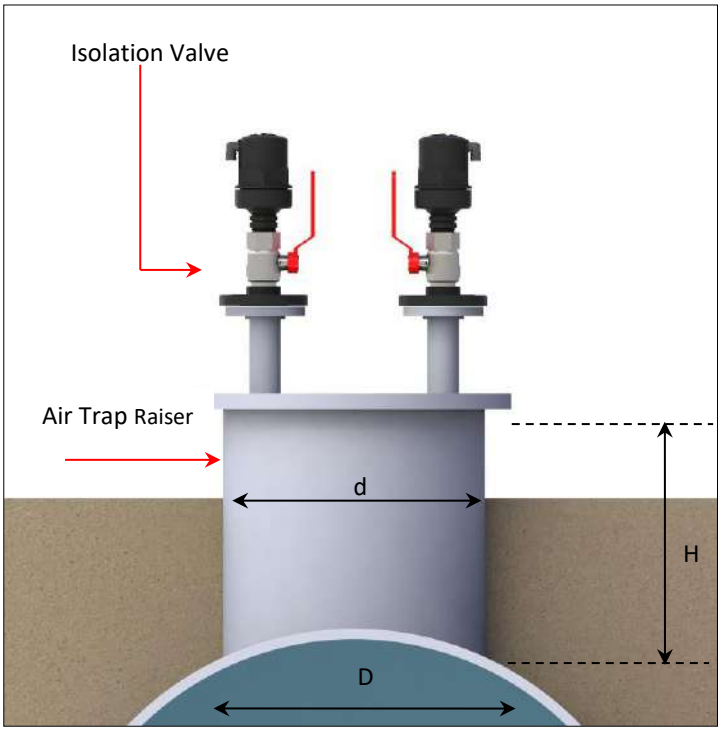
2.2. Conventions and Measurements

This paragraph presents and explains the terms and measurements used for the Installation process.

D = Diameter of pipeline

d = diameter of riser

H = Height of riser on the pipeline
(Measured from crown of pipeline)



- For pipelines up to 12" (300mm) in diameter (D), the Air Trap diameter (d) should be the same as the pipeline diameter.
- For larger pipelines of up to 60" (1500mm) in diameter (D), the Air Trap diameter (d) should be 60% of the pipeline diameter.
- For larger than 60" (1500mm) pipelines (D), the Air Trap diameter (d) should be 35% of the pipeline diameter.
- The Air Trap length (H) should allow easy access to the air valve from below and should be at least 6" (150mm).

2.3. Installation Instructions

1. Flush the system before installing the air valve to avoid any debris or sharp objects getting into the air valve.
2. Carefully remove the air valve from the shipping package. Unload all air valves carefully to a sturdy level surface taking care not to drop them.
3. Install an isolating valve below the air valve, connected by a riser to the crown of the pipe.
4. A.R.I. S-050 automatic air release valve should be installed vertically on a riser on the crown of the pipeline.

3. Operation

The A.R.I. S-050 Automatic Air Release Valve releases accumulated air from the system while it is under pressure. The air release component is designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

4. Troubleshooting

Symptom	Possible Causes	Solution
Discharge Outlet Elbow is broken.	Valve was hit or mishandled.	Easy to replace: gently pry off the Elbow with screwdriver Pressure insert the replacement part using a plastic hammer. Replacement part can be ordered from Aquestia Note: The part is not mandatory for the function of the valve.
Outlet thread size needed in order to attach a vent/ drain pipe	End user needs to connect a vent/drain pipe from the discharge outlet.	1/2", 3/4", 1" S-050 has 1/8” female thread. End of pipe must be left open in order for valve to function.
Valve spits water.	This is normal at start up and during pressure test. Could be debris stuck to the sealing mechanism.	Perform steps for BASIC MAINTENANCE
Valve is continuously leaking.	Line pressure issues (inadequate pressure) or debris lodged in seal or O-rings.	Check line pressure. It needs at least 0.2bar (3 psi) to seal tight. Is the valve on a booster pump? Can be an installation issue if the valve is level with the water level in a tank - there is no pressure to seal. Perform steps for BASIC MAINTENANCE
Valve leaks from threads.	Damaged O-ring Plastic threads stripped.	Replace the Base O-ring Check for cross-threading. Replace Base. Offer to replace with a metal Base.

5. Periodic Maintenance

Please note that the periodic maintenance of the air valve is an integral part of the proper pipeline maintenance regime; it should be maintained at least once a year in accordance with the quality and composition of the fluid in the system.

Important: Before performing any work on the air valve, make sure that all workers on site are familiar with the section of safety instructions in this document and with all the relevant local and general safety instructions, standards and work regulations.

5.1. Preparation

5.1.1. Required tools and materials:

- Small bowl with kitchen type liquid soap
- 4.5mm roll pin punch

5.2. First Stage Maintenance

Perform when a small leak is detected from the Discharge Outlet and clogging or debris in the sealing mechanism is suspected

5.2.1. Releasing Pressure

- Shut the isolating valve located on the riser under the air valve
- Carefully release the pressure and drain the air valve
- Important: Discard liquid to comply with local regulations

5.2.2 Removal of the Air Valve Body

- Slowly turn the Body (1) counterclockwise, and remove it [2]

1

2

5.2.3. Cleaning of the Air Valve

- Thoroughly wash and clean the air valve components under clean running water to remove all grime; Pay special attention to the internal parts.

- Using the roll pin punch [1], push the Inlet Filter out of the Base [2], [3]. Thoroughly wash and clean it, then reassemble it [4], [5]. Make sure that the Filter is seated correctly in the Base [6].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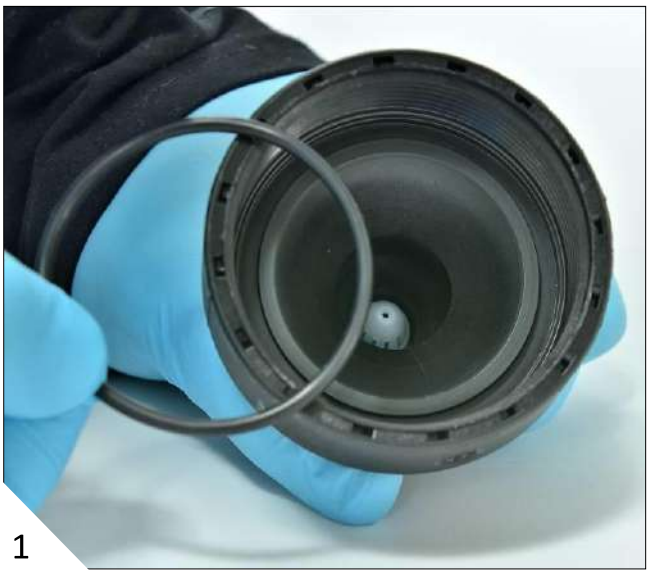
- Thoroughly clean the O-ring (replace it if needed [1]. Make sure that the O-ring is correctly seated in its designated groove [2].



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5.2.4. Assembly and Testing for Leaks

- Reassemble the air valve in reverse order of paragraphs 5.2.3 and 5.2.2.
- Slowly open the isolating valve located on the riser under the air valve.
- Look for leaks in the Outlet Discharge Elbow.

- If the air valve still leaks, proceed to Second Stage Maintenance

5.3. Second Stage Maintenance

Perform if the first stage doesn't solve the leak, if one of the seals or inner parts need replacement or for periodic maintenance to thoroughly clean the valve.

5.3.1. Releasing Pressure

- Shut the isolating valve located on the riser under the air valve
- Carefully release the pressure and drain the air valve
- Important: Discard liquid to comply with local regulations

5.3.2. Removal of the Air Valve Body

- Slowly turn the Body (1) counterclockwise, and remove it [2]

1

2

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5.3.3. Cleaning and inspecting the Inlet Filter

- Using the roll pin punch [1], push the Inlet Filter out of the Base [2], [3].
- Thoroughly wash and clean it, check for any damage and if needed, replace it.
- Reassemble the filter [4], [5] and make sure that it is seated correctly in the Base [6].


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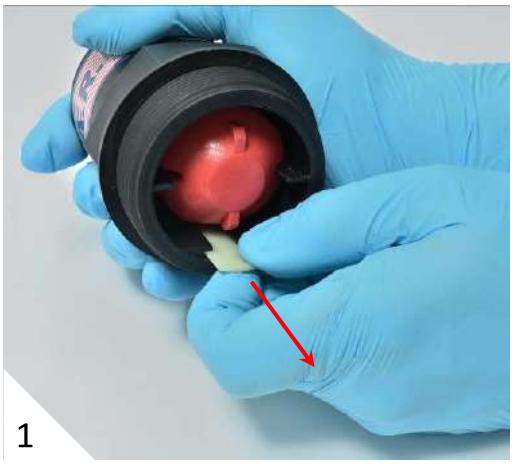
5.3.4. Disassembly of the Float

- Hold the Body, turn it to the side [1] and remove the Clamping Stem [2] and the Float [3] (together with the Rolling Seal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5.3.5. Cleaning and inspecting the components

- Thoroughly but gently wash and clean all the components under clean running water. Pay attention to the sealing area inside the Body.
- Visually check the condition of the Rolling Seal [1] & [2]. If any cracks or tears are found remove it from the Float and replace it.

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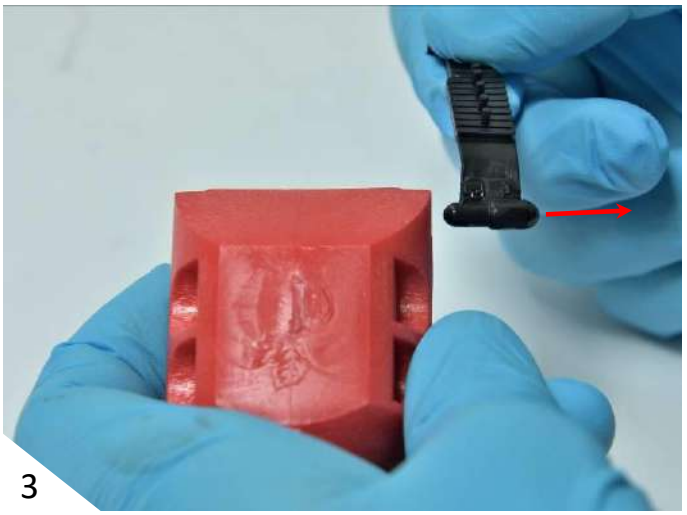
- If replacement is necessary, slide out and remove the Rolling Seal Assembly [3]
- Take a new Rolling Seal Assembly and dip the tail end into the liquid soap solution [4]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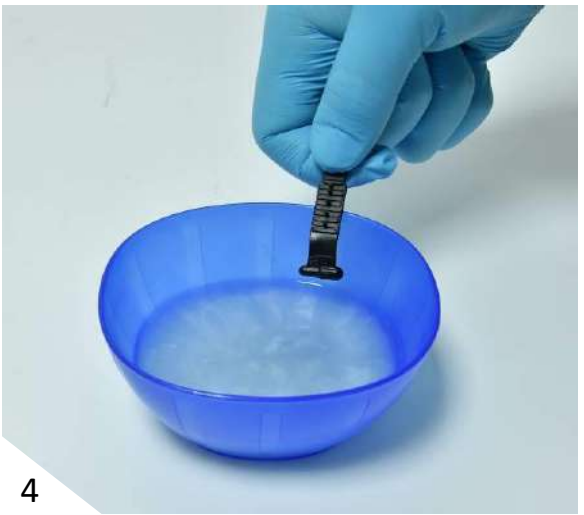
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- Pay attention to the correct position and direction and insert the tail end of the Rolling Seal Assembly into the groove on the Float [5].

- Gently pull the Rolling Seal Assembly until it is partially inserted into the Float grove. Use the 4.5mm Roll Pin Punch to push the Rolling Seal Assembly to the middle of the Float [6] and align the middle of the Rolling Seal Assembly tail with the midline of the Float [7].

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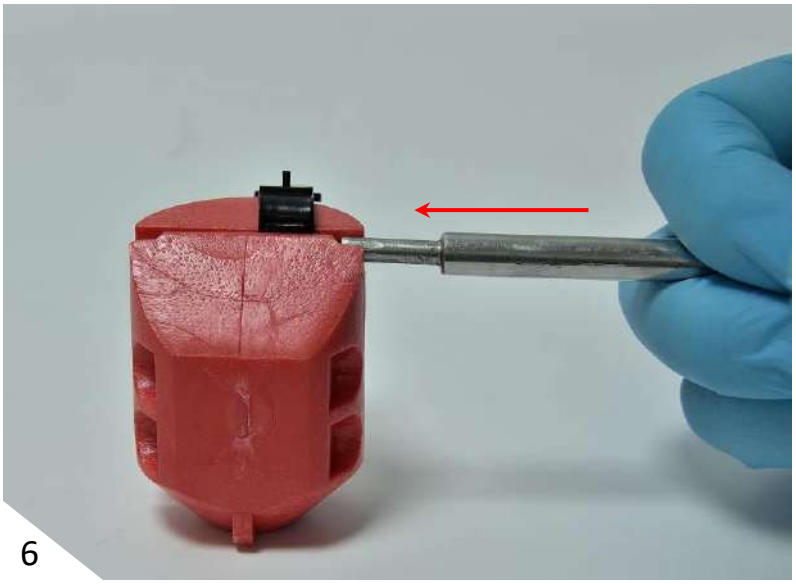

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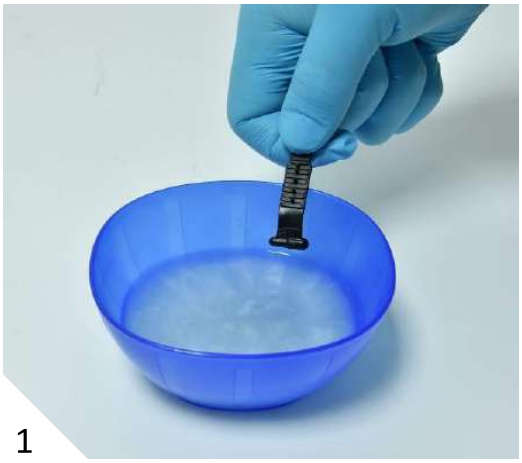
5.3.6. Reassembling the Operating Valve

- Dip the head end of the Rolling Seal into the liquid soap solution [1]



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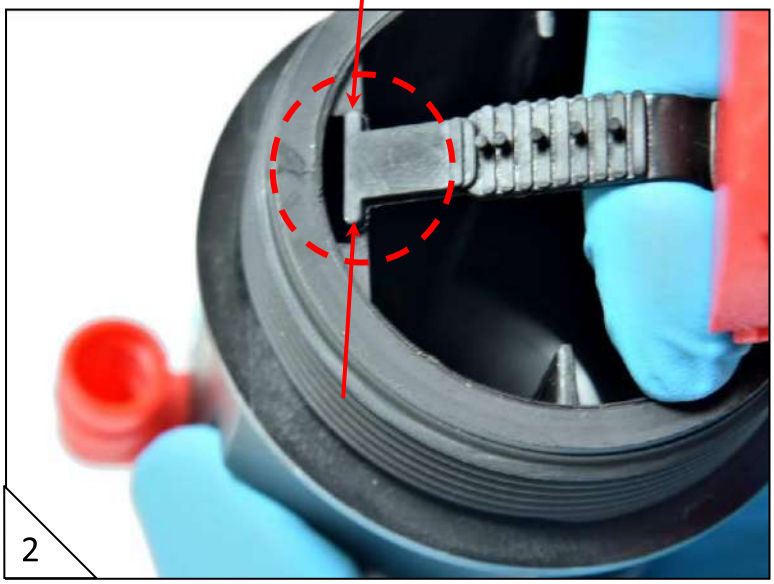
- Reassemble the Operating Valve by inserting the loose end of the Rolling Seal into its designated groove in the Body, making sure that the end of the seal and the insertion are in the direction of the arrows [2], [3].



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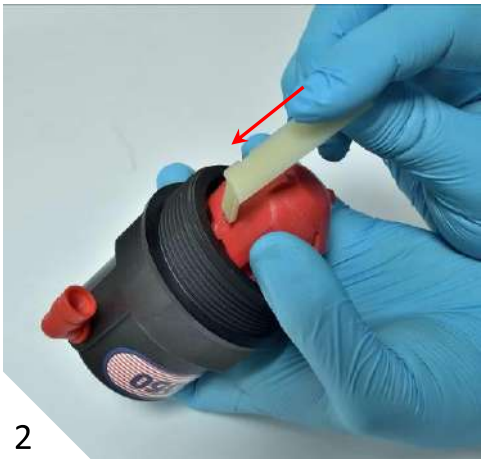
- Insert the Float halfway into the Body [1], insert the Clamping Stem into the Rolling Seal groove of the Body; make sure that it is inserted in the direction of the arrow [2]. Push the Float and the Clamping Stem together downwards into the Body until they are locked [3].

1



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5.3.7. Assembly and Testing for Leaks

- Reassemble the air valve in reverse order of chapter 5.2.
- Slowly open the isolating valve located on the riser under the air valve.
- Look for leaks in the Outlet Discharge Elbow.

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6. Assembly BOM Table and Drawing

1	Body
2	Discharge Outlet Elbow
3	Rolling Seal Assembly
4	Float
5	Clamping Stem
6	O-ring
7	Base