Installation, Operation & Maintenance

Aquestia
Directing the Flow

ELIPTIX R-30 MF 10-14”

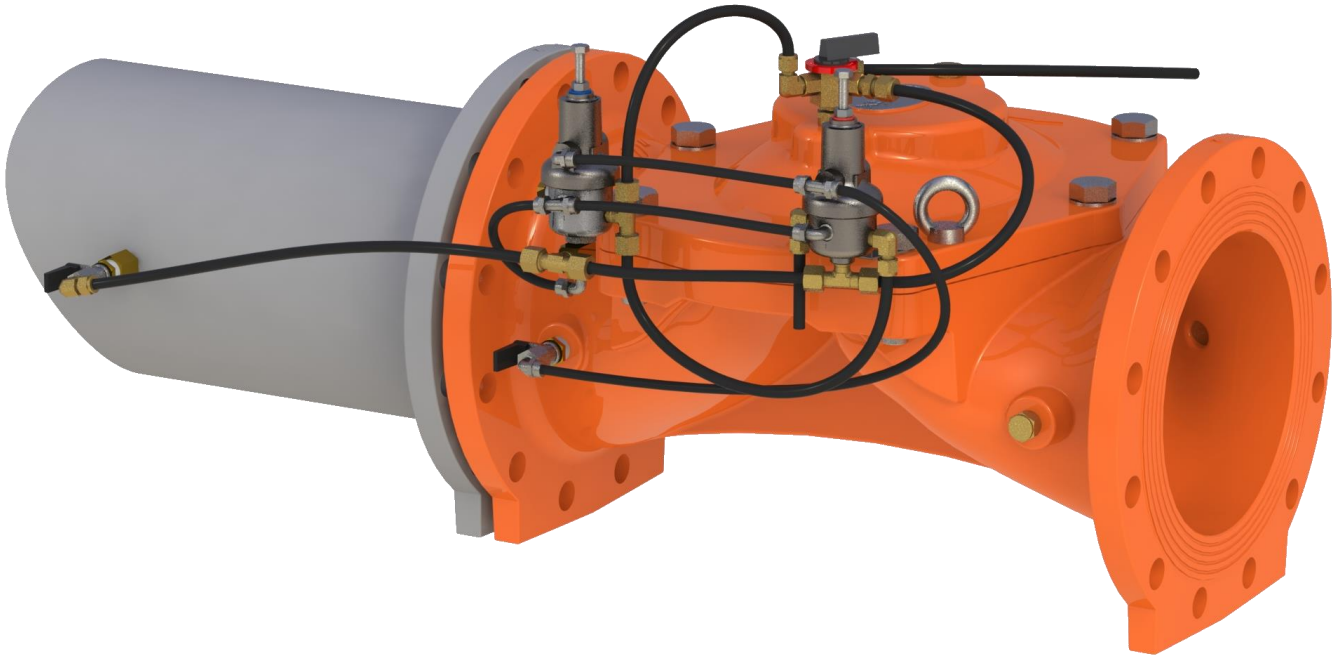
Flow Control Valve

3 Way

The following is a step-by-step narrated description of the Eliptix R-30 MF 3W Flow Control Valve installation, operation and maintenance processes.

The Eliptix R-30 Series is a line of metal, diaphragm-operated, hydraulic control valves.
The valves are suitable for installation in agriculture, water transmission and waterworks systems for irrigation, landscape and infrastructure applications.

The Eliptix R-30 MF Flow Control Valve is activated by the line pressure and partly open to allow a preset constant flow-rate. The flow-rate is determined by an orifice plate where the head-loss across the orifice is proportional to the actual flow-rate. With increasing head loss, the control valve automatically closes, with decreasing head loss, it opens. The combined operation of the orifice plate and the pilot maintains a constant flow rate, regardless of line pressure fluctuations.



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Disclaimer

1. 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 with 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.

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. For lifting and positioning the product, use only approved lifting equipment operated by authorized employees and contractors.
3. Prior to the installation visually verify that the product was not damaged during shipment to the installation site.

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.

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.

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's 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 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 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.

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.

2. Installation

2.1. Pre-Installation Requisites

1. **Important**: Before performing any work on the 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. Before installing the valve, flush the pipeline to remove scale, dirt and other particles that might affect the valve performance.
3. Carefully remove the valve from the shipping package. Unload all valves carefully to a sturdy and leveled surface taking care not to drop them.
4. Valves fitted with hoist rings should only be lifted and conveyed using these hoist rings.
5. It is recommended that the valve be easily accessible and clearly marked to prevent damage.
6. Prepare a threaded 1/4" outlet on the upstream pipeline for the upstream pressure sensing connection of the control valve.

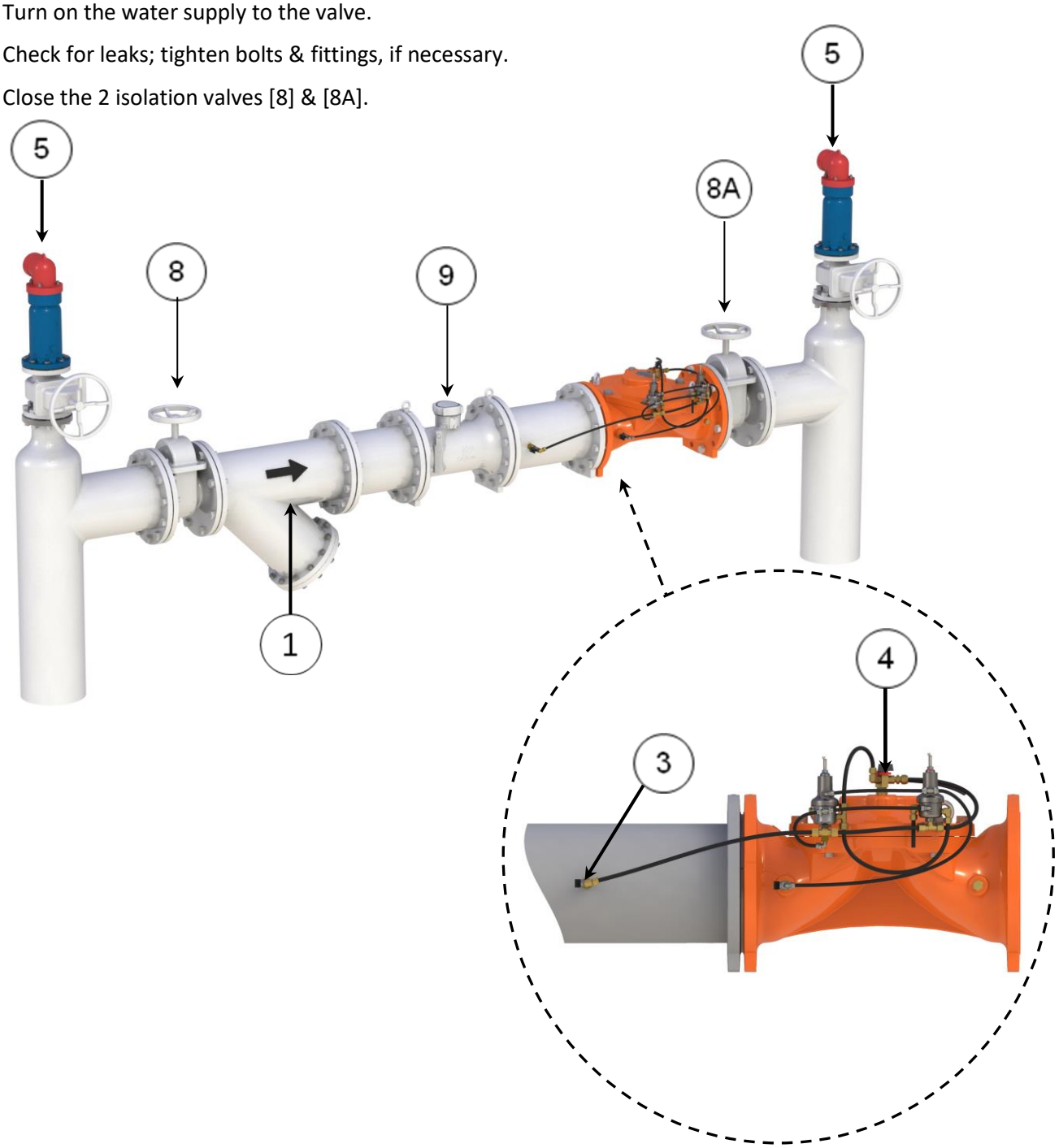
2.2. Installation Procedure

1. Install the valve as indicated by the arrow on the valve bonnet, indicating flow direction [1].
2. Install the orifice plate that is supplied with the control valve between the flanges upstream of the control valve. Install surface seals on both sides of the orifice.
3. Connect the filter and the ball valve [3] (supplied with the valve) to the 1/4" outlet on the upstream pipeline.
4. Connect the outlet of the ball valve [3] to the pilot's port #1 [2] with a control tube.
5. In addition to the control valve, it is recommended to install the following valves:

   Isolation valves upstream and downstream of the control valve [8] & [8A].

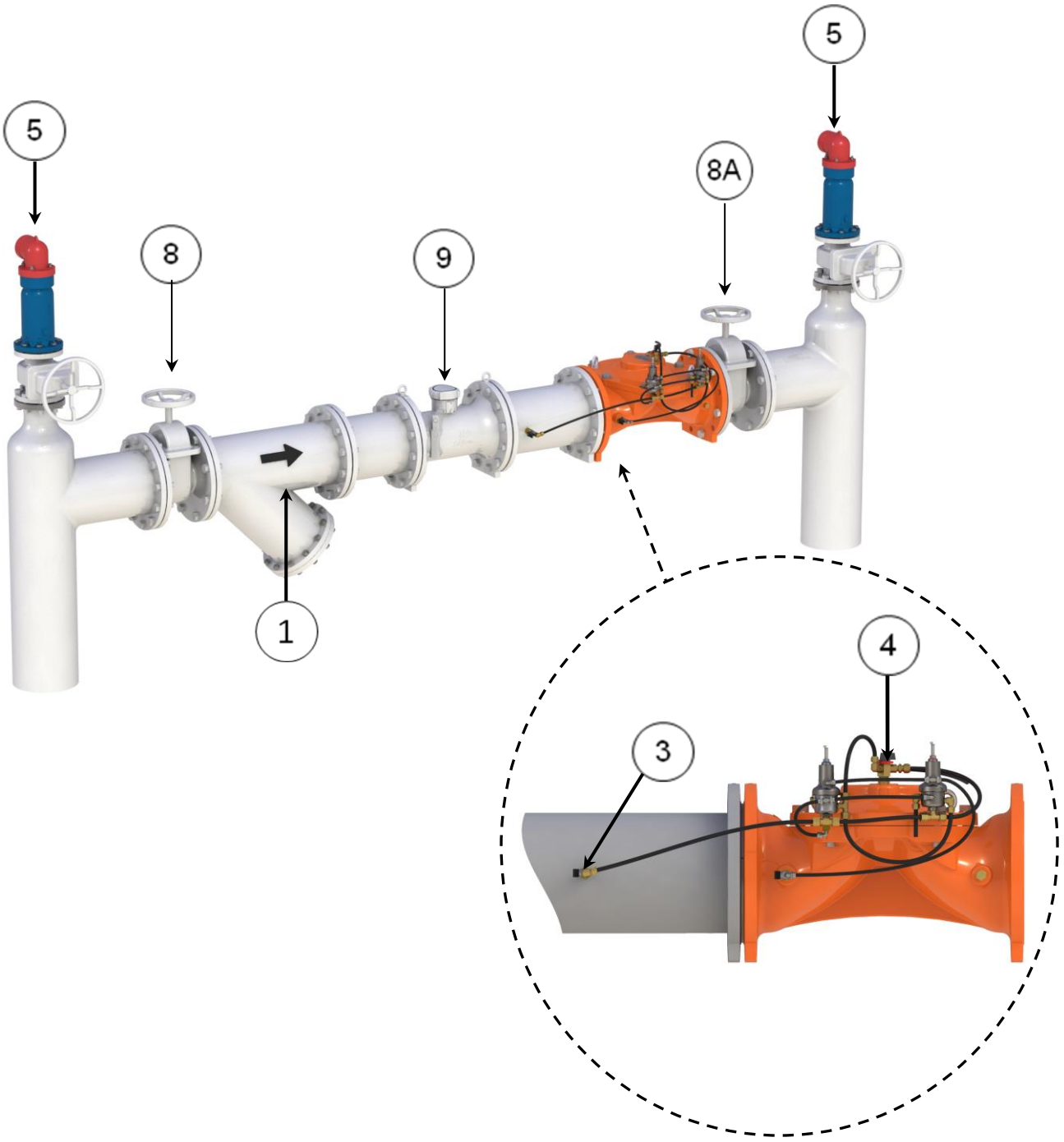
   Air valves upstream and downstream of the control valve [5].

   Water meter upstream of the control valve [9].
6. Close the 3-way selector [4] to its "CLOSE" position
7. Turn on the water supply to the valve.
8. Check for leaks; tighten bolts & fittings, if necessary.
9. Close the 2 isolation valves [8] & [8A].



2.3. Initial Start-up – The Control Valve

1. Make sure that the upstream and the downstream isolation valves are closed [8] and [8A].
2. Make sure that the inlet ball valve [3] is open.
3. Gradually open the upstream isolation valve [8].
4. Check for leaks; tighten bolts & fittings, if necessary.
5. Turn the 3-way selector [4] to its "AUTO" position.
6. Gradually open the downstream isolation valve [8A].



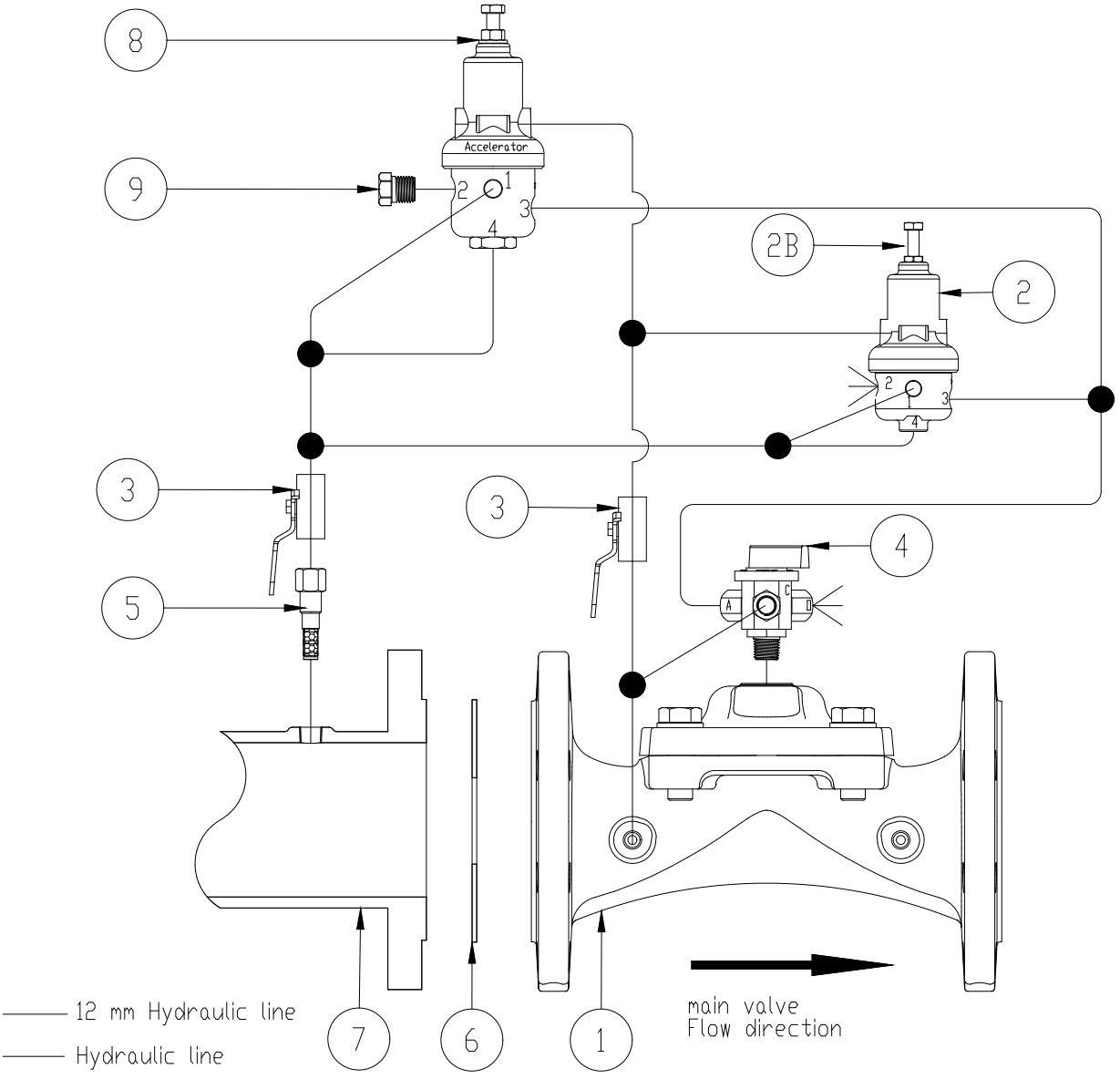
2.4. Initial Start-up – The Flow Control Application

1. The following is a general description of the Flow Control Application:

   When the flow-rate drops below the pre-set level, the pilot senses the head-loss drop across the orifice through its ports # 1 and #5 and releases water from the control chamber out to the atmosphere through port #2 causing the valve to slightly open until the flow-rate returns to the pre-set level.

   When the flow-rate exceeds the pre-set level, the pilot senses the head-loss across the orifice through its ports #1 and #5 and enables water to flow to the control chamber through port #4 causing the valve to slightly close until the flow-rate returns to the pre-set level.

No.	Description	QTY.
1	Main Valve	1
2	Differential pilot valve, 3-Way	1
3	Ball valve, 2-Way, N.O.	1
4	Manual selector, ball valve, 3-Way	1
5	Finger Filter	1
6	Orifice reducer	1
7	Main line – Out of supply scope	1
8	Differential Accelerator pilot valve, 3-Way	1
9	Plug	1



3. Operation & Flow-rate Calibration Instructions

ADJUSTING THE REQUIRED FLOW RATE LIMIT

1. Make sure that there is a downstream flow demand.
2. Turn the #2 pilot valve's locking nut counter clockwise, until it touches the adjusting bolt head.
3. Make sure that the 3-way selector [4] on its "AUTO" position.
4. Turn the #2 pilot valve's adjusting bolt until fully closed, always depleting the control chamber
5. Turn the #8 pilot valve adjusting bolt counterclockwise all the way up.
6. The valve should be closed now with water running from the differential pilot #2 vents port #2.
7. Turn the #8 pilot valve's adjusting bolt clockwise until you reach the required set point, the valve is open and the flow is stable.
8. Turn the #2 pilot valve's adjusting bolt clockwise until you reach the required set point
9. To increase the flow, turn the adjusting bolt clockwise, one turn at a time, allowing sometime between turns for the valve to respond. Flow is shown on your flowmeter. Continue until required flowrate is reached.
10. To decrease the flow, turn the adjusting bolt counterclockwise, one turn at a time, allowing sometime between turns for the valve to respond. Flowrate is shown on your flowmeter. Continue until required flowrate is reached.
11. When the required flowrate is reached, prevent the adjusting bolt from turning, and turn the locking nut clockwise until it touches the pilot bonnet. Tighten the nut carefully.

Operation Instructions

1. To manually open the valve, turn the manual 3-Way selector [4] to its "OPEN" position.

   Please note: By doing so you will have no control over the flow-rate.
2. To manually close the valve, turn the manual 3-Way selector [4] to its "CLOSE" position.
3. To maintain the pre-set flow-rate, turn the 3-way selector [4] to its "AUTO" position.

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4. Troubleshooting

Symptom	Possible Causes	Check	Solution
Valve does not open	1. The inlet pressure is too low	1. Check the inlet pressure	1. Make sure water supply and/or pump is on.
	2. The 3-Way selector (4) is set to "close".	2. Check the position of the 3-way selector (4)	2. Turn the 3-Way selector (4) to "Auto".
	3. Blocked pilot	3. No water is coming out through the pilot's #2 port.	3. Contact Aquestia's field service
	4. The pilot's adjusting bolt (2B) is fully open	4. Check the position of the pilot's adjusting bolt (2B)	4. Turn the adjusting bolt (2B) counter-clockwise, one turn at a time, allowing sometime between turns for the valve to respond. Continue until the required flow-rate is reached.
Valve does not close	1. Debris on the sealing seat	1. The valve is constantly discharging small amount of water	1. Turn the 3-way selector (4) to "open" for 5 seconds, and then to "close". If the problem continues, turn off the water supply to the valve. Remove the bonnet and diaphragm, remove the foreign object, and check that the diaphragm, body and cover are not damaged.
	2. The Diaphragm is damaged	2. The valve is constantly discharging small amount of water	2. Turn off the water supply to the valve. Remove the bonnet and replace the diaphragm.
	3. The 3-Way selector is in its "OPEN" position.	3. Check the 3-way selector.	3. Turn the 3-Way selector (4) to "AUTO" or "CLOSE" position
	4. Blocked self-flushing filter (5).	4. Disconnect the control tube from the self-flushing filter (5) and check for free water flow.	4. Turn off the water supply to the valve, remove the filter and clean or replace it.
Unstable flow-rate	Blocked or damaged pilot	Unstable flow-rate	Contact Aquestia's field service.
Incorrect but stable flow-rate	Wrong preset flow-rate		Readjust the flow-rate as described in the Initial Set-up chapter (2.4).

5. Maintenance

Under regular operation Eliptix's valves require minimal maintenance and no lubrication, however in freezing climates the valve should be dismantled and drained for the winter months.

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

5.1. Periodic Inspection

1. Rotate the 3-way selector valve [m] handle 360^{o} to prevent sticking by sediments at fixed intervals*.
2. Check- and clean the control filter at fixed intervals (*).
3. Check flow meter and adjust pilot valve if required.

(*) The maintenance intervals will vary from site to site as a function of the operating frequency and the water quality. It is recommended to start with a 3-month interval, and increase over time until a pattern can be established.

5.2. Storing the Valve

It is not recommended to store the valve or its spare parts for long periods (years); under improper storage conditions rubber parts can harden, have ozone cracking, grow mold bloom and heat aging.

It is recommended to order new rubber parts when required.