

Eliptix by **A.R.I.**
Hydraulic Control Valves

R-30 R 2W

Pressure Reducing Control Valve 2 Way

The following is a step by step narrated description of the Eliptix R-30R 2W Pressure Reducing Valve installation, operation and maintenance processes.

The A.R.I. 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 R-30 series has an innovative elliptic shaped diaphragm that integrates well with a wide variety of regulating control pilots, solenoids and control accessories.

They are compatibility designed for water level control, flow control, electric & remote control as well as pressure reducing & pressure sustaining operation.

The R-30 Pressure Reducing Valve is designed to reduce a higher upstream pressure to a preset lower downstream pressure and to maintain this constant pressure regardless of flow-rate or upstream pressure fluctuations.



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- Repairs made in and to the products by personnel not authorized by A.R.I.
- Maintenance or repairs using parts or components other than those specified by A.R.I. and in their original condition.
- Operating the products in ways other than the operating procedures described in the manuals provided by A.R.I., or resulting from not following the cautionary remarks and warnings in the product manual.
- Improper storage, workplace conditions and environmental conditions which do not conform to those stated in the Product manual.
- Fires, earthquakes, floods, lightning, natural disasters, or acts of God.

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1. SAFETY INSTRUCTIONS

General

1. A.R.I. 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 all products' outlet ports are not directed toward electrical elements (pumps) or people.
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 A.R.I. Any misuse of the product may lead to undesired damages and may affect your warranty coverage. Please consult with A.R.I. 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 A.R.I. at A.R.I.'s sole discretion.
11. Please note that A.R.I. 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 A.R.I. 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. 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.

Installation

1. Install the product according to the detailed Installation Instructions provided with it by A.R.I. and according to the description given in this manual.
2. The user should install manual Isolation Valves at the valve's upstream and downstream ports.
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 (when exist) 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 A.R.I. 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 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 valves and release the residual pressure:
 - A. For control valves with a pressure release outlet, slowly open the pressure release plug or the ball valve and make sure that all pressure is released.
 - B. For control valves without a pressure release outlet, slowly unscrew the flange bolts until all the pressure is released from the valve.
5. Make sure the control 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.

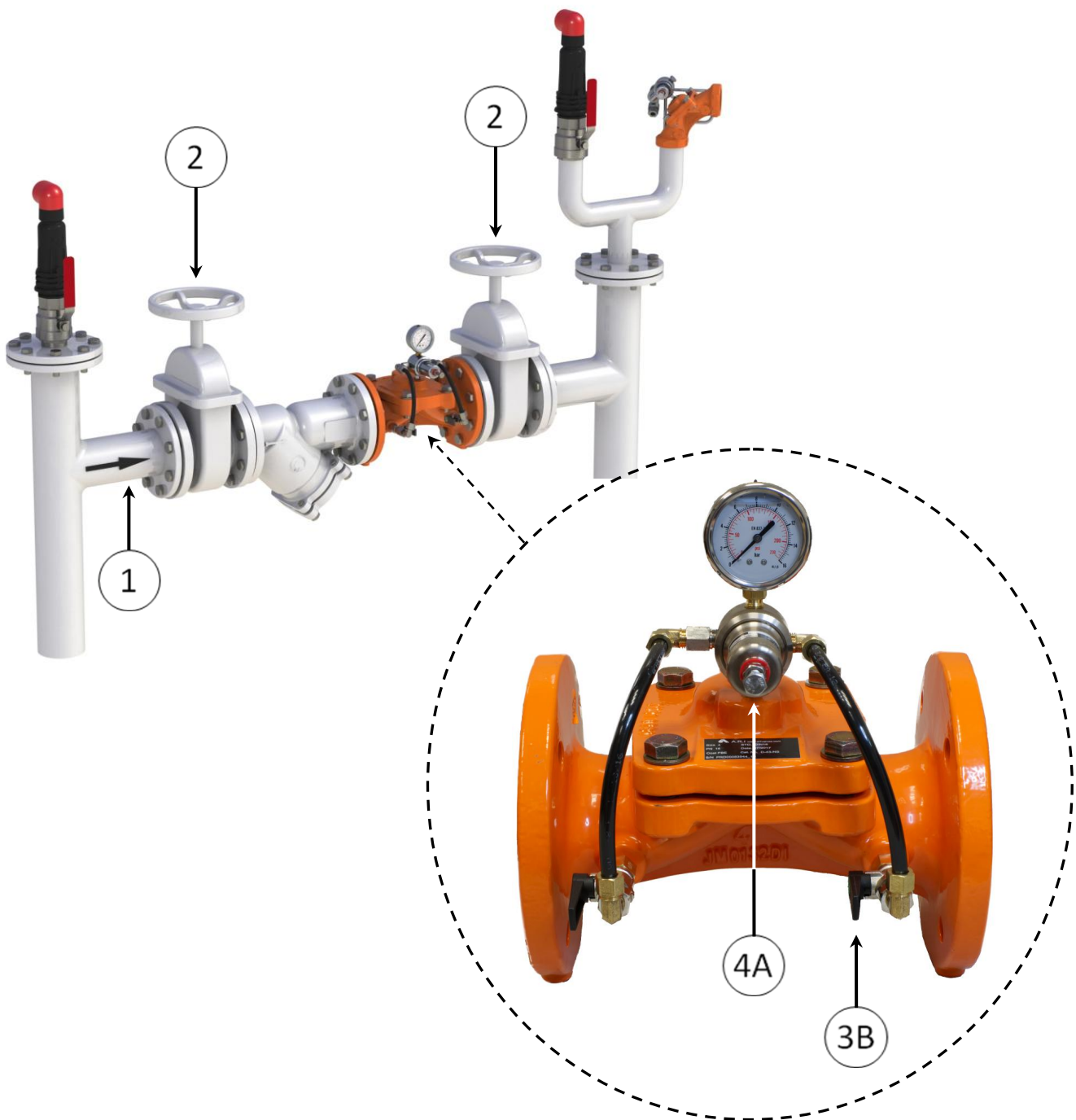
2. INSTALLATION

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 the valves carefully to a sturdy and level 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 for preventing damage.

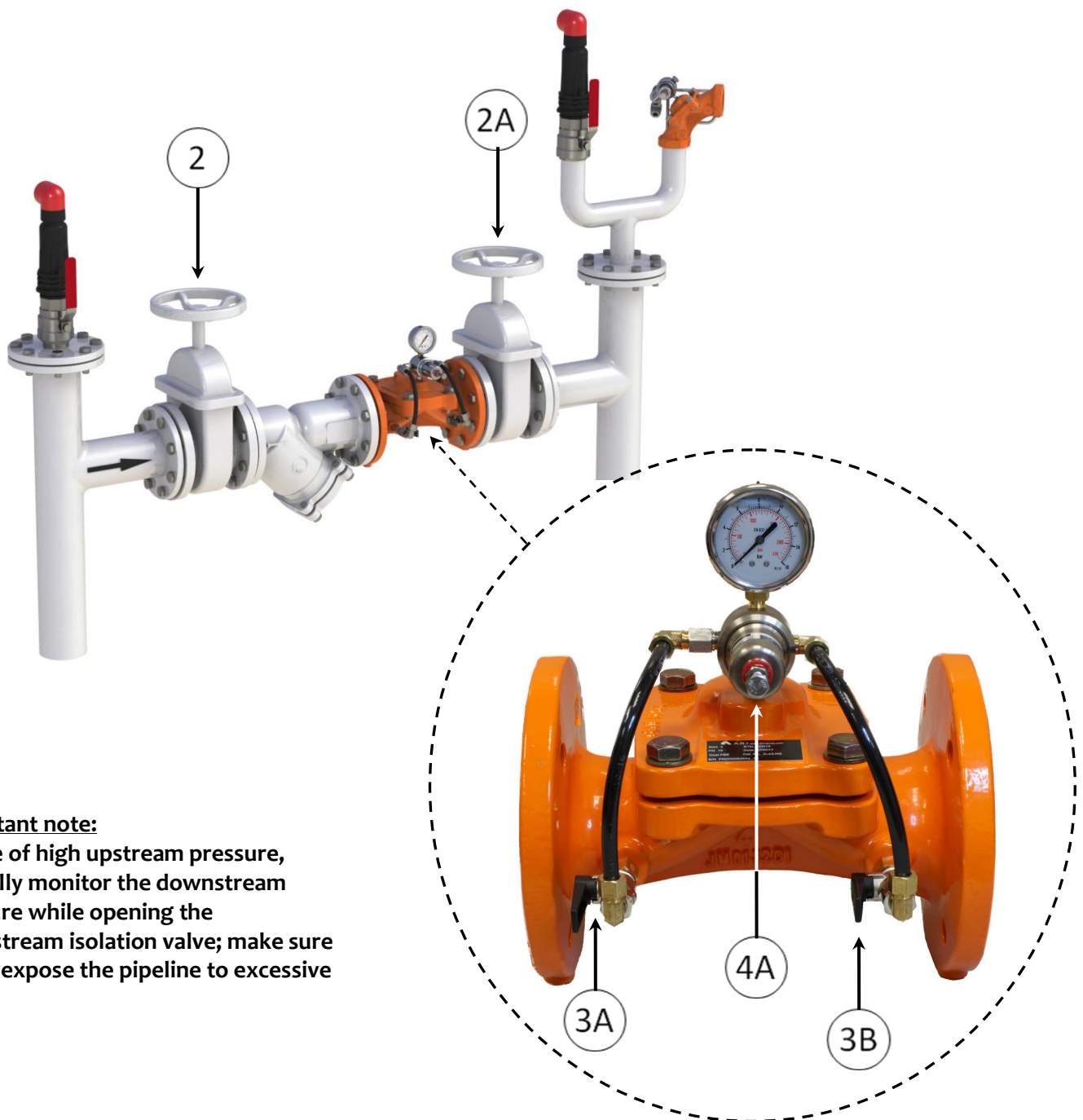
2.2. Installation procedure

1. Install the valve as indicated by the arrow on the valve bonnet, indicating flow direction [1].
2. It is recommended to install isolation valves upstream and downstream of the control valve [2].
3. Close the 2-way outlet ball valve [3B], and turn on the water supply to the valve.
4. Check for leaks; tighten bolts & fittings, if necessary.
5. Turn the adjusting screw [4A] counter-clockwise until there is no pressure on the spring.
6. Close the 2 isolation valves [2].



2.3. Initial Start-up - The Control Valve

1. Make sure that the upstream and the downstream isolation valves are closed [2] and [2A].
2. Turn off the manual 2-way ball valve at the downstream [3B] port of the valve.
3. Slowly open the upstream isolation valve [2].
4. Turn on the manual 2-way ball valves of the upstream [3A] and the downstream [3B] ports of the valve.
5. Slowly open the downstream isolation valve [2A], water starts to flow to the pipeline.
6. Turn the adjusting screw [4A] clockwise until the downstream pressure reaches the required level.



Important note:

In case of high upstream pressure, carefully monitor the downstream pressure while opening the downstream isolation valve; make sure not to expose the pipeline to excessive

2.4. Initial Set-up - The Pressure Reducing Application

1. The following is a general description of the Pressure Reducing Application:

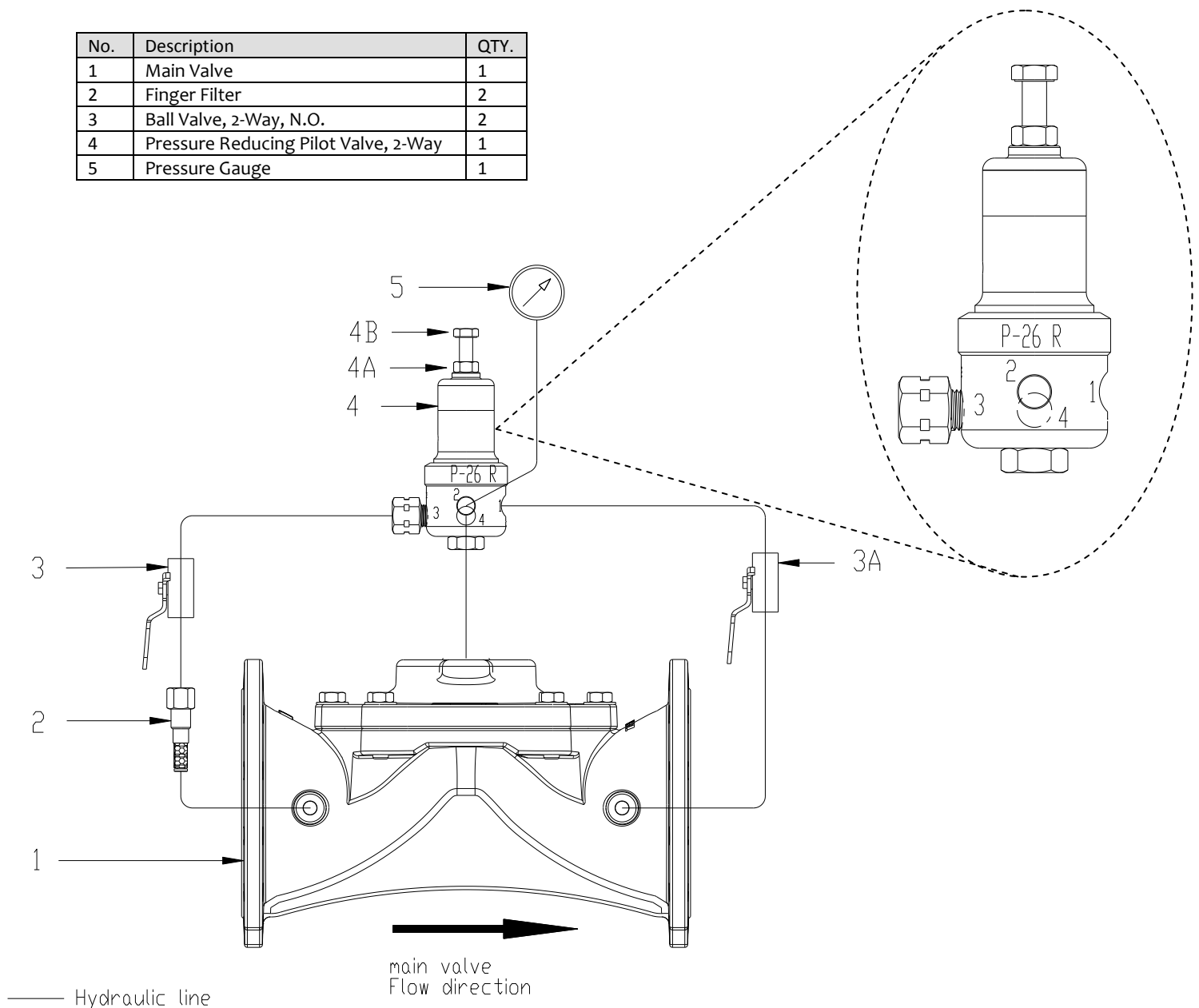
This pressure-reducing valve is an automatic control valve designed to reduce a higher upstream pressure to a preset lower downstream pressure, and to maintain this constant pressure regardless of flow-rate or upstream pressure fluctuations.

Pipeline water flows constantly through the control loop. The pilot senses the downstream pressure through its #1 port.

When the downstream pressure is higher than the pilot's pressure settings, the pilot increases the internal pressure of the control chamber by increasing the water flow through port #3, causing the valve's diaphragm to slightly close and decrease the downstream pressure back to the required settings level.

When the downstream pressure is lower than the pilot's pressure settings, the pilot decreases the internal pressure of the control chamber by decreasing the water flow through port #3, causing the valve's diaphragm to slightly open and increase the downstream pressure back to the required settings level.

No.	Description	QTY.
1	Main Valve	1
2	Finger Filter	2
3	Ball Valve, 2-Way, N.O.	2
4	Pressure Reducing Pilot Valve, 2-Way	1
5	Pressure Gauge	1



2. Make sure that there is a downstream flow demand.
3. Turn the pilot valve's locking nut (4A) counter clockwise, until it touches the adjusting bolt (4B) head.
4. Make sure that the 2-way ball valves (3) are open.
5. Turn the adjusting bolt (4B) clockwise until the valve starts to open.
6. To increase the downstream pressure, turn the adjusting bolt (4B) clockwise, one turn at a time, allowing sometime between turns for the valve to respond. Downstream pressure is shown on the pressure gauge (5). Continue until the required pressure is reached.
7. To decrease the downstream pressure, turn the adjusting bolt (4B) counterclockwise, one turn at a time, allowing sometime between turns for the valve to respond. Downstream pressure is shown on the pressure gauge (5). Continue until the required pressure is reached.
8. When the required pressure is reached, prevent the adjusting bolt (4B) from turning, and turn the locking nut (4A) clockwise until it touches the pilot bonnet. Tighten the nut carefully.

3. OPERATION INSTRUCTIONS

1. To manually open the valve, close the 2-way inlet ball valve (3). Make sure that the 2-way outlet ball valve (3a) is open.

Please note:

- By doing so you will have no control over the downstream pressure; it is possible that your system will be exposed to excess pressure.
 - The valve cannot fully open when the control loop is of a two-way type.
2. To manually close the valve, close the 2-way outlet ball valve (3A). Verify that the 2-way inlet ball valve (3) is open.
 3. To maintain downstream preset pressure, open the inlet and the outlet ball valves (3), (3A).

4. MAINTENANCE

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

4.1. Periodic Inspection

1. Every 6 months visually inspect the valve's diaphragm for any tears.
2. Every 12 months inspect the valve's operation and clean the Finger Filter.
3. Check the downstream pressure; adjust if required.

4.2. 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.

5. TROUBLESHOOTING

Problem	Cause	Check	Solution
Valve does not open	1. Inlet pressure is too low	1. Check the inlet pressure	1. Make sure that the water supply (or the pump) is on.
	2. The 2-way outlet valve (3A) is closed	2. Check the state of the 2-way outlet ball valve (3A)	2. Open the 2-way outlet ball valve (3A)
Valve does not close	1. Debris on the sealing seat	1. The valve is constantly discharging a small amount of water to the downstream	1. Close the 2-way inlet ball valve (3) and open the 2-way outlet ball valve (3A) for 5 seconds, then close the 2-way outlet ball valve (3A), and open the 2-way inlet ball valve (3). If the problem continues, turn off the water supply to the valve, remove the bonnet and remove the foreign object.
	2. Diaphragm is damaged		2. Turn off the water supply to the valve, remove the bonnet and replace the diaphragm
	3. The 2-way inlet ball valve (3) is closed.	3. Check the stat of the 2-way inlet ball valve (3).	3. Open the 2-way inlet ball valve (3).
	4. Blocked pilot		4. Contact A.R.I.'s field service
Unstable downstream pressure	Blocked or damaged pilot	Unstable pressure downstream of the valve	Contact A.R.I.'s field service
Incorrect but stable, downstream pressure	Wrong preset pressure		Readjust the downstream pressure as described in the Initial Set-up chapter (2.4).

6. DISMANTLING AND ASSEMBLING THE VALVE

6.1. Preparation

1. Required tools:

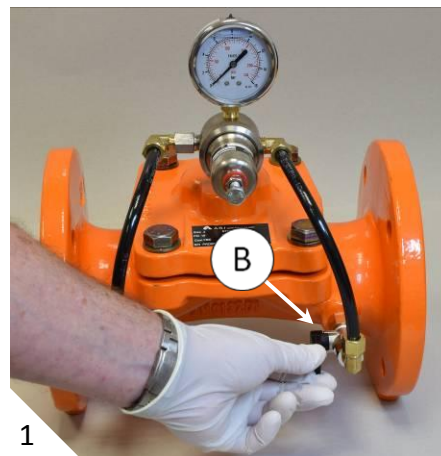
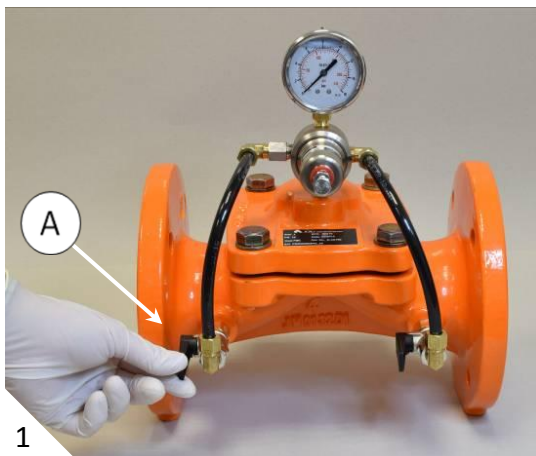
Standard hand tools:

- 14 mm spanner open at one end and ring at the other
- 16 mm spanner open at one end and ring at the other
- 19 mm spanner open at one end and ring at the other
- 20 mm spanner open at one end and ring at the other
- 24 mm spanner open at one end and ring at the other

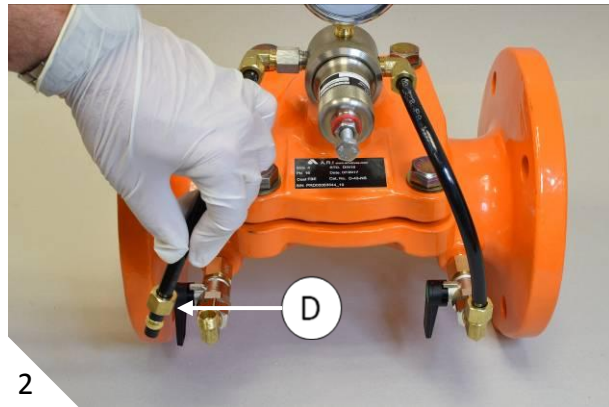
2. Release Pressure - Make sure that the water supply to the valve is switched off, release any residual pressure and isolate the valve from the pipeline by closing the upstream and the downstream isolation valves.

6.2. Disassembling the control loop

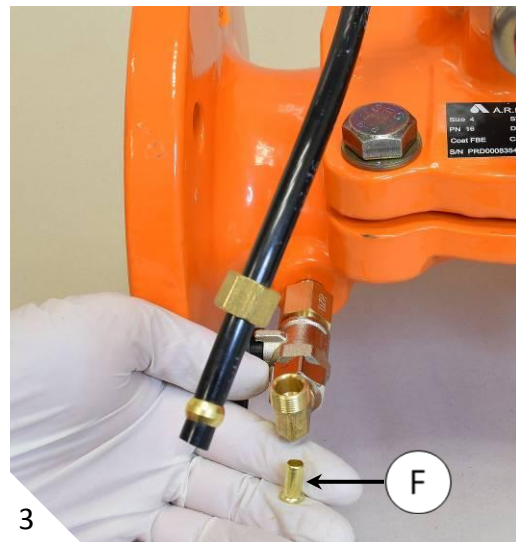
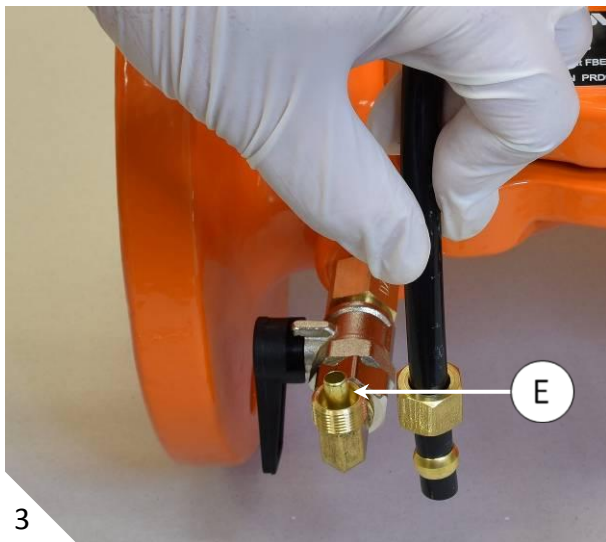
1. Close the two 2-way ball valves [A] & [B].



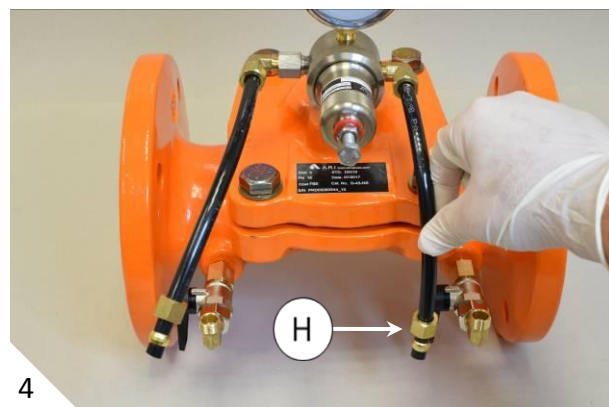
- Using a 16mm spanner [C], disconnect the control tube from the first 2-Way ball [D].



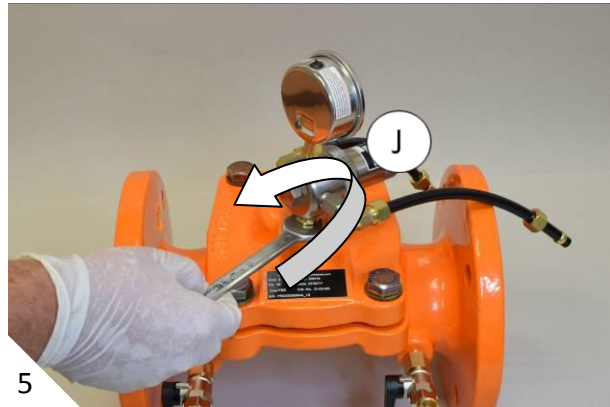
- Make sure not to lose the brass insert from the tip of the control tube [E] & [F].



- Repeat the same process with the control tube of the second 2-Way ball valve [G] & [H].

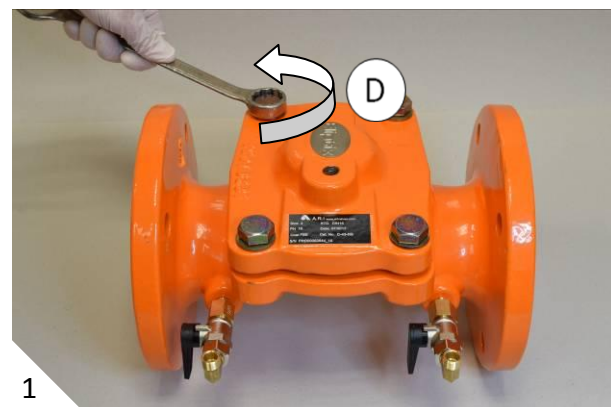
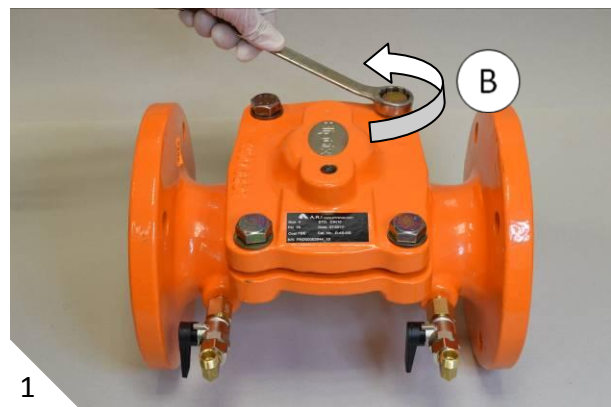
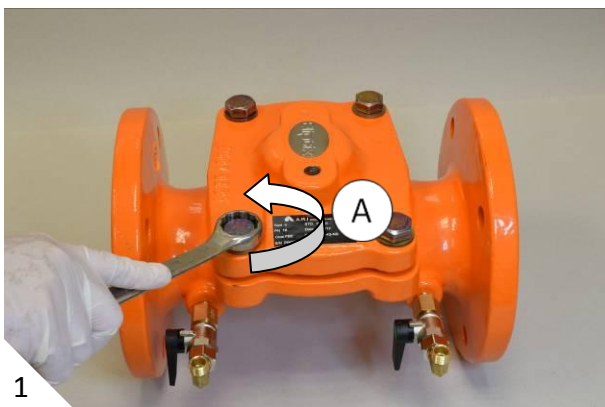


5. Using a 15mm spanner, disconnect the pilot valve assembly from the R-30 valve [I] - [K].

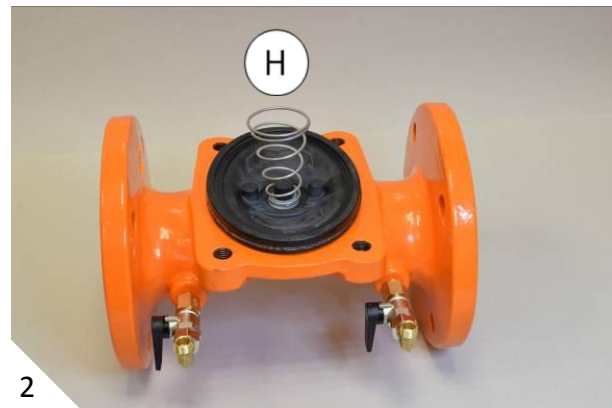


6.3. Disassembling the valve:

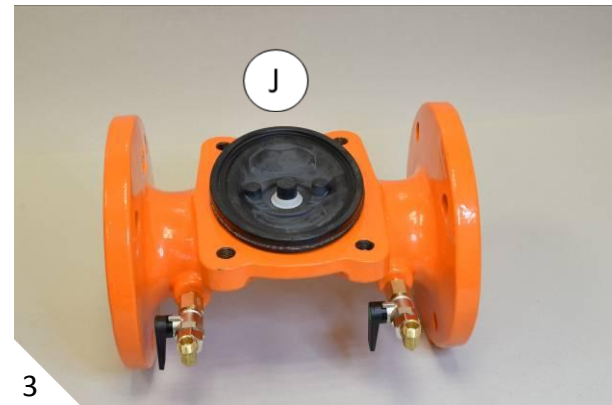
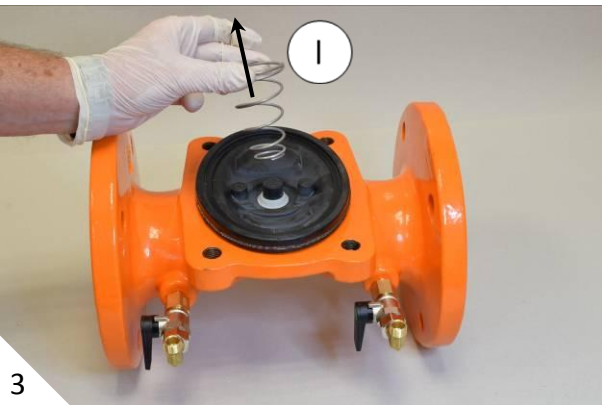
1. Using a 24mm spanner, release the 4 bolts of the valve's bonnet in a diagonal manner [A] - [D].



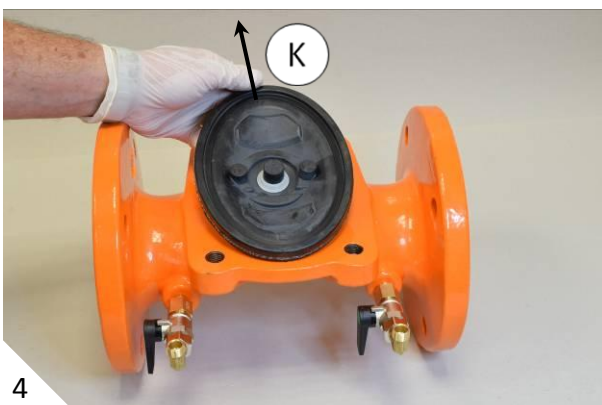
2. Un-screw the bonnet's bolts' [E] & [F] and remove the bonnet from the valve's body [G] & [H].



3. Remove the valve's spring [I] & [J].

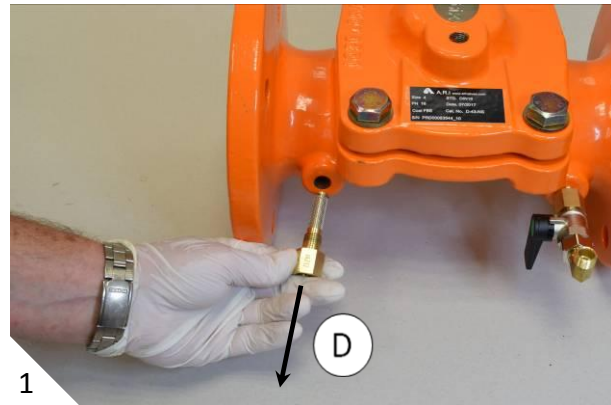
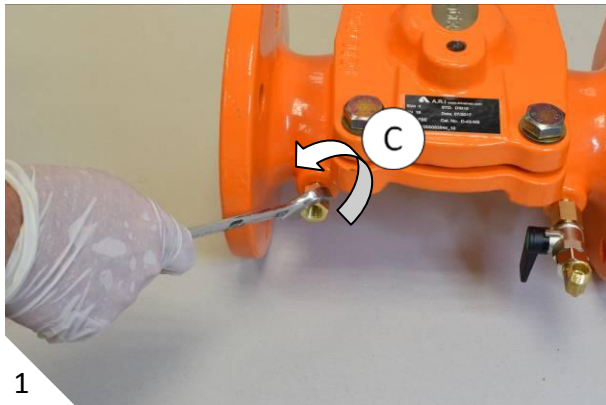
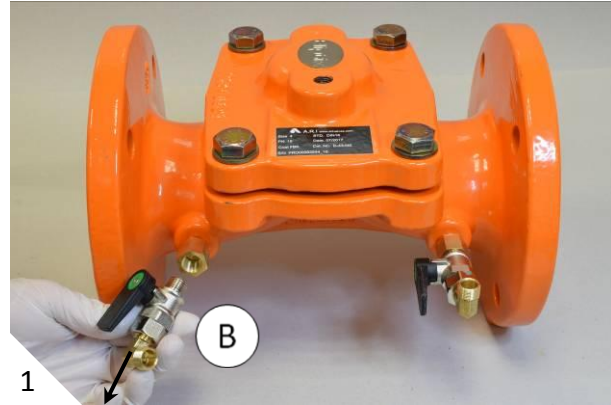
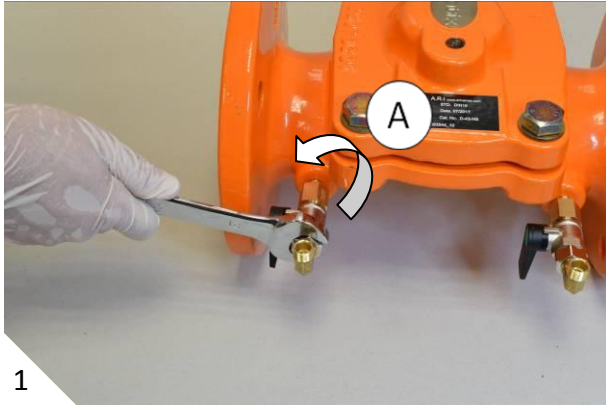


4. Remove the valve's diaphragm [K] & [L].



6.4. Cleaning the Finger Filter:

1. Disassemble and clean the finger-filter; using a 20mm spanner, release the upstream 2-way manual valve [A], [B]. Then using a 19mm spanner, release the finger-filter and clean it [C], [D].



6.5. Reassembling the valve:

1. Make sure that all the valve's components are in good condition, clean and free from sediments.
2. Check the diaphragm for any wear and tear; if necessary replace it with a new one.
3. Make sure that the finger-filter is clean.
4. Reassemble the valve in reverse order of the above described disassembling steps.
5. While reassembling the valve, make sure that the bonnet is evenly seated and tightened in all directions, parallel to the valve's body.

6.6. Reassembling the Control loop:

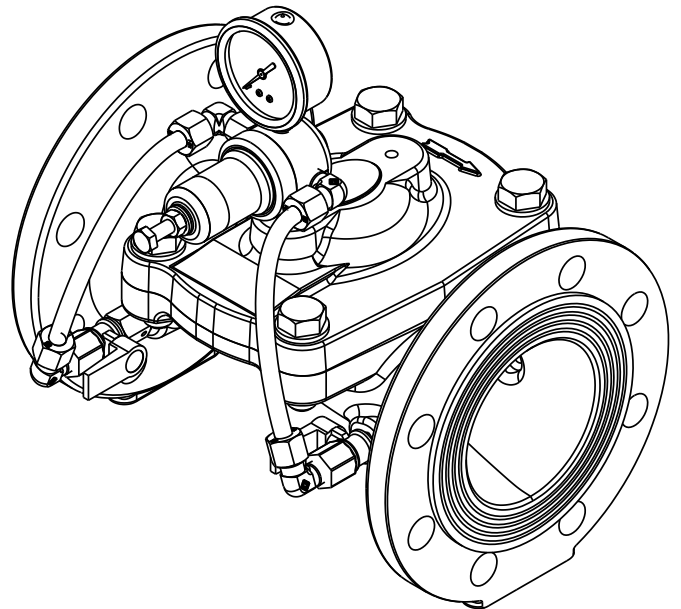
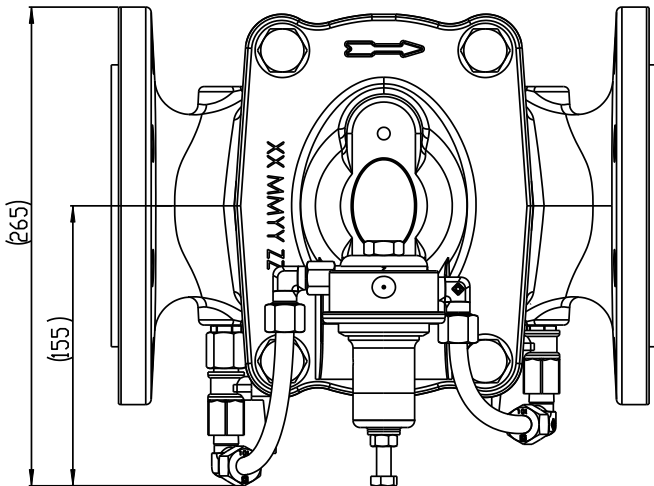
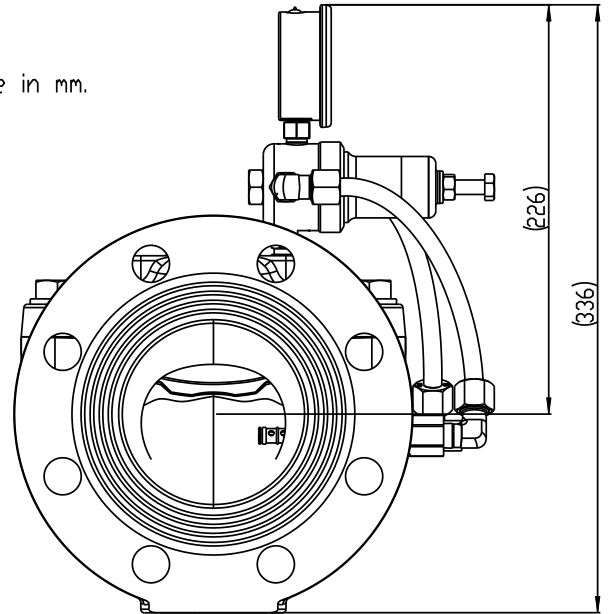
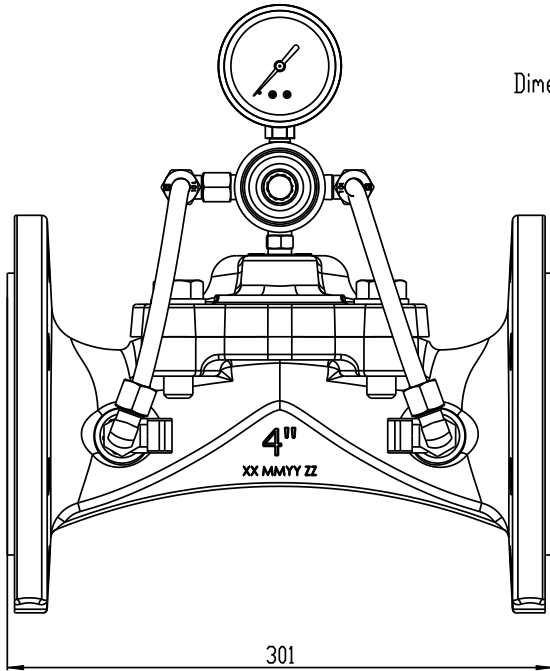
1. Make sure that all the control loop components are in good condition and clean.
2. Clean the control tubing entry holes.
3. Reassemble the control loop in reverse order of the above described disassembling steps.

6.7. Recommendation:

Replacement of the diaphragm and some internal parts is recommended after about three years of operation, please see chapter 6 for instructions:

1. Remove the cover of the valve.
2. Clean the valve body from sediments.
3. Clean the control tubing entry holes.
4. Install a new Diaphragm and Elastomers.

7. DIMENSIONAL DRAWING



8. A.R.I. LIMITED WARRANTY

A.R.I. Standard International Warranty

A.R.I. manufactured products are guaranteed to be free from defect in material and/or workmanship and to perform as advertised when properly installed, used and maintained in accordance with current instructions, written or verbal.

Should any item prove defective within the time period set forth for that item(s), but in any case not later than within 12 (twelve) months of that product having left A.R.I.'s premises, and subject to receipt by A.R.I. or its authorized representative, of written notice thereof from the purchaser within 30 days of discovery of such defect or failure - A.R.I. will repair or replace or refund the purchase price, at its sole option, any items proven defective in workmanship or material.

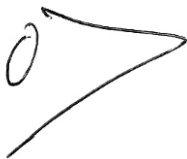
A.R.I. will not be responsible, nor does this warranty extended to any consequential or incidental damages or expenses of any kind or nature regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to our products upon which repairs or alterations have been made by other than an authorized A.R.I. representative.

This warranty does not extend to components, parts or raw materials used by A.R.I. but manufactured by others, which shall be only to extent warranted by the manufacturer's warranty.

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