



CSA waterworks line

Direct acting downstream pressure
reducer-stabilizer

Mod. VRCD

Introduction

This manual will provide you with the information to properly install and maintain CSA direct acting pressure reducers Mod. VRCD. 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 VRCD 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 8. 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 direct acting PRV Mod. VRCD consists of a upstream pressure balanced single seat globe pattern valve, piston actuated, and equipped with a spring located in the cover to impart the force necessary for the proper working. The operating principle is explained on the technical catalogue, for further explanations please contact us. The VRCD will automatically throttle and modulate the water supply to maintain a pressure downstream, regardless of upstream pressure fluctuations. The special design of CSA with built in self cleaning piston technology guarantees long lasting performances with a dramatic reduction of the maintenance time, minimizing the risk of friction and malfunctioning.

Handling and Storage



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.

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 adjusting screw. 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. Vertical installation is allowed up to the DN 100 mm prior to consult with us. 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. For the recommended flow rate and differential pressure please refer to the sizing information displayed in the catalogue or contact us sending the project data for further assistance.

- Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from



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.

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
- **Note to Engineer:** The direct acting pressure reducing valve VRCD will regulate and maintain a downstream pressure value according to the force of the spring, located inside the cover, supplied with three different versions to cover :

Downstream pressure regulation from 1.5 to 6 bar (blue spring, standard)

Downstream pressure regulation from 5 to 12 bar (red spring, standard)

Downstream pressure regulation from 5 to 12 bar (blue spring, on request)

The spring range is usually indicated on the stainless steel identification plate and on the order confirmation, should the pressure needed be outside of it contact us for an immediate replacement of the spring, do not exert excessive torque on the spring or relief it completely

Maintenance

The pressure reducer VRCD is sturdy and reliable, and it was designed to minimize maintenance. A semi-annual visual inspection for the proper movement of the piston and the cleaning of the compensation chamber is recommended. A routine maintenance for gasket, control, o-rings and if needed replacements is recommended every 4 years and explained on page (11) 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, seeping through the shaft and leaking through to the cover, hunting and excessive variation of the downstream pressure.

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
- Unless the valve has been ordered with a specific setting turn the adjusting screw (9) anticlockwise to relief the spring (not completely), make sure VRCD will respond with a smooth modulation by reducing the downstream pressure.
- Open completely the upstream gate valve.
- Let VRCD work and modulate according to the demand, act on the adjusting screw (9) by turning it clockwise to increase the downstream pressure and check the pressure gauges.
- Allow for enough time for the system to balance.
- By means a pressure gauge upstream and downstream and a flow meter make sure that both the flow rate and difference in pressure, in dynamic condition, doesn't go above the recommended values displayed in the catalogue.
- Be sure to allow for 5 mt increase in the set pressure occurring between dynamic and static (no flow) conditions



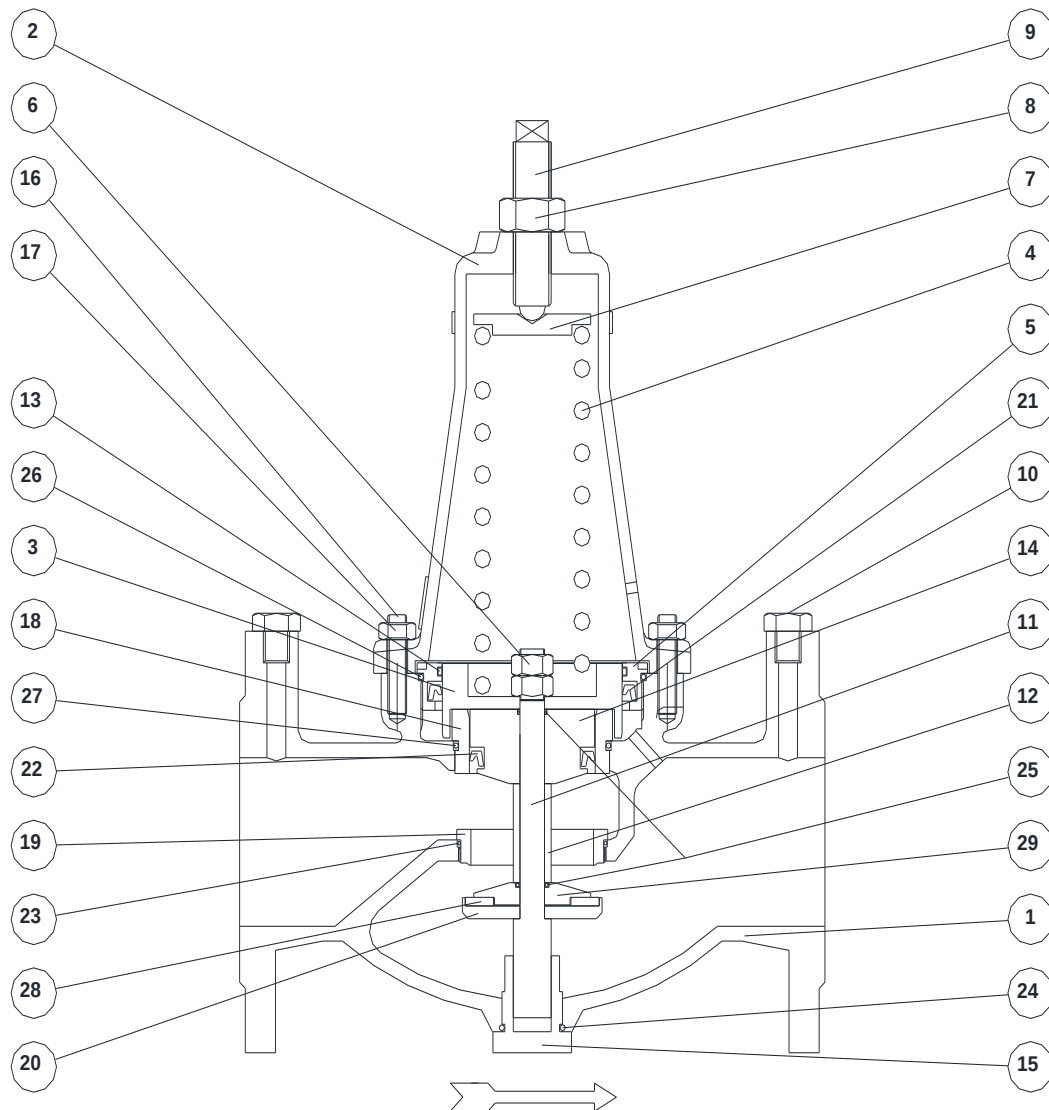
WARNING!

When the valve reacts to modulate, in reducing the downstream pressure, the effective pressure variation on the line depends on the length of the entire system and part of the network subject to the VRCD. This could take sometimes minutes, therefore allow for it before acting on the spring.

The flow rate is an effect of the pressure reduced by the VRCD for that specific system. A certain outlet pressure value, for an instance 3 bar, wouldn't produce the same flow rate everywhere as it depends on headloss between the valve itself and the final boundary conditions.

Drawings

Picture 1



POS.	DESCRIPTION	MATERIAL
1	Body	GJS 500-7
2	Cap	GJS 500-7
3	Upper piston	S.S. AISI 303
4	Spring	SiCr
5	Upper ring	S.S. AISI 304
6	Nuts	S.S. AISI 304
7	Spring guide	Brass/S.S. AISI304
8	Nut	S.S. AISI 304
9	Driving screw	S.S. AISI 304
10	Tap for pressure gauges	Brass
11	Guiding screw	S.S. AISI 303
12	Spacer	Brass/S.S. AISI304
13	Sliding ring	Ptfe
14	Lower piston	Brass/S.S. AISI304
15	Driving tap	Brass/S.S. AISI304
16	Studs	S.S. AISI 304
17	Nuts	S.S. AISI 304
18	Lower ring	Bronze
19	Obturator sealing seat	S.S. AISI 304
20	Obturator guide	S.S. AISI 304
21	Gasket	NBR
22	Gasket	NBR
23	O-ring	NBR
24	O-ring	NBR
25	O-ring pair	NBR
26	O-ring	NBR
27	O-ring	NBR
28	Plane gasket	NBR/VULKOLAN
29	Gasket support	Brass

Spare parts nr: 4 – 13 – 19 – 21- 22 – 23 – 24- 25 – 26 – 27 – 28

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

Problem	Cause	Solution
The valve doesn't close	There is dirt accumulated between the obturator and the seat	Remove the valve and clean it inside to remove dirt
	The pressure downstream is below the set point	Check the pressure coming into the circuit
	There is dirt inside causing friction to the piston	Check the movement of the piston and remove dirt or foreign materials
	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 valve doesn't open	The spring is corroded and filled with water, causing the loss of force	Check if the VRCD has been submerged by water, check the spring inside the cover and replace if necessary
	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 piston during its movement	Check the movement of the piston and remove dirt or foreign materials

1) Disassembly

In order to carry out the proper maintenance of VRCD proceed as follows, ref drawing picture 1 on page 7, for further info consult our technical support :

1. slowly close the upstream and downstream gate valves;
2. if the VRCD is installed in a location not suitable for maintenance, please remove it from the pipe ;
3. turn the screw (9) anticlockwise to relief the spring (4)
4. remove the nuts holding the cover (17)) and take out the cover (2) and spring (4)



WARNING!

Do not remove the nuts (17) holding the cover without having completely relieved the spring by turning the screw (9) anticlockwise. Inattention may cause severe damages and injuries to the personnel .

5. be sure not to loose the spring guide (7) when the spring is removed
6. push the upper piston (3) downwards
7. remove the driving tap (15), the hexagonal part of the guiding screw (11) will be visible
8. set the hexagonal part with a wrench and keep it steady while unscrewing the first nut (6) holding the piston tight
9. push up the guiding screw (11) remove the second nut too (6)
10. pull out the upper piston (3) separating it from the lower piston (14), during this phase make sure not to damage the o-ring (25), check the latter and replace it if necessary
11. check the lip gasket (21) for possible dirt or sign of wear , clean and replace it if necessary
12. check the guiding ring (5) and the upper piston surface making sure no sign of ear, scratches are present
13. pull out the lower piston (14) and check for the lip gasket (22) making sure there is no sign of dirt, foreign materials or damages, clean or replace it if necessary.
14. remove the spacer (12)
15. drop down the remaining driving screw (11) with the obturator (20-28-29) block laying on the bottom of the valve
16. push the driving screw (11) downwards through the hole where the tap was (15) , the obturator block (20-28-29) remaining inside the body
17. extract the obturator block from the downstream side
18. paying attention to the o-ring (25), check it and replace if necessary
19. remove the gasket support (29) from the obturator guide (20) and check the status of the plane gasket (28) for possible sign of cavitation, scratches, dirt. Clean and replace it if necessary
20. check the downstream side of the reducer for possible sign of cavitation, holes
21. check the surface of the upper ring (5) , lower ring (18) and seat (19) for possible scratches, dirt. Clean it and replace if necessary. If so make sure not to damage the o.rings present for the water tightness of all of them.

1) Reassembly

In order to carry out the proper reassembly of VRCD follow the instruction explained on page 12 in reverse. Pay 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) Once the mobile block composed of the obturator block, upper and lower pistons, spacer, is assembled check for the proper movement making sure there are not sign of friction or any other element affecting it.

Contact us for further assistance



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.