



CSA treated water line

Direct acting upstream pressure
relief-sustaining valve

Mod. VSM

Introduction

This manual will provide you with the information to properly install and maintain CSA direct acting pressure relief/sustaining valves Mod. VSM. 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, goggles, when dealing and handling hazardous pipelines and valves.

Inspection

Your valve VSM 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 PSV Mod. VSM 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 in detail on the technical catalogue, for further explanations please contact us. The VSM will automatically throttle and modulate the water supply to maintain a preset and adjustable upstream pressure, 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 pressure relief/sustaining 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 and valve sizing.



WARNING!

The difference in pressure generated by the valve when closed or during modulation 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 both the value in dynamic conditions and 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 relief/sustaining valve VSM will regulate and maintain an upstream pressure value according to the force of the spring, located inside the cover, supplied with two different range (standard version):

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

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

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

Maintenance

The pressure relief/sustaining valve VSM 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 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, or seeping through the shaft and leaking through to the cover, hunting and excessive variation of the upstream 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 downstream gate valve by 30%, then open slowly the upstream 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 VSM will respond with a smooth modulation by reducing the upstream pressure increasing the flow.
- Open completely the downstream gate valve.
- Let VSM work and modulate according to the demand, act on the adjusting screw (9) by turning it clockwise to increase the upstream pressure, anticlockwise to decrease and check the pressure gauges for further reference.
- Allow for enough time for the system to balance.
- By means a pressure gauge upstream and a flow meter make sure that both the flow rate and difference in pressure, in dynamic condition, don't exceed the recommended values displayed in the catalogue.
- Be sure to allow for at least 5 mt increase in the set pressure occurring between dynamic



WARNING!

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

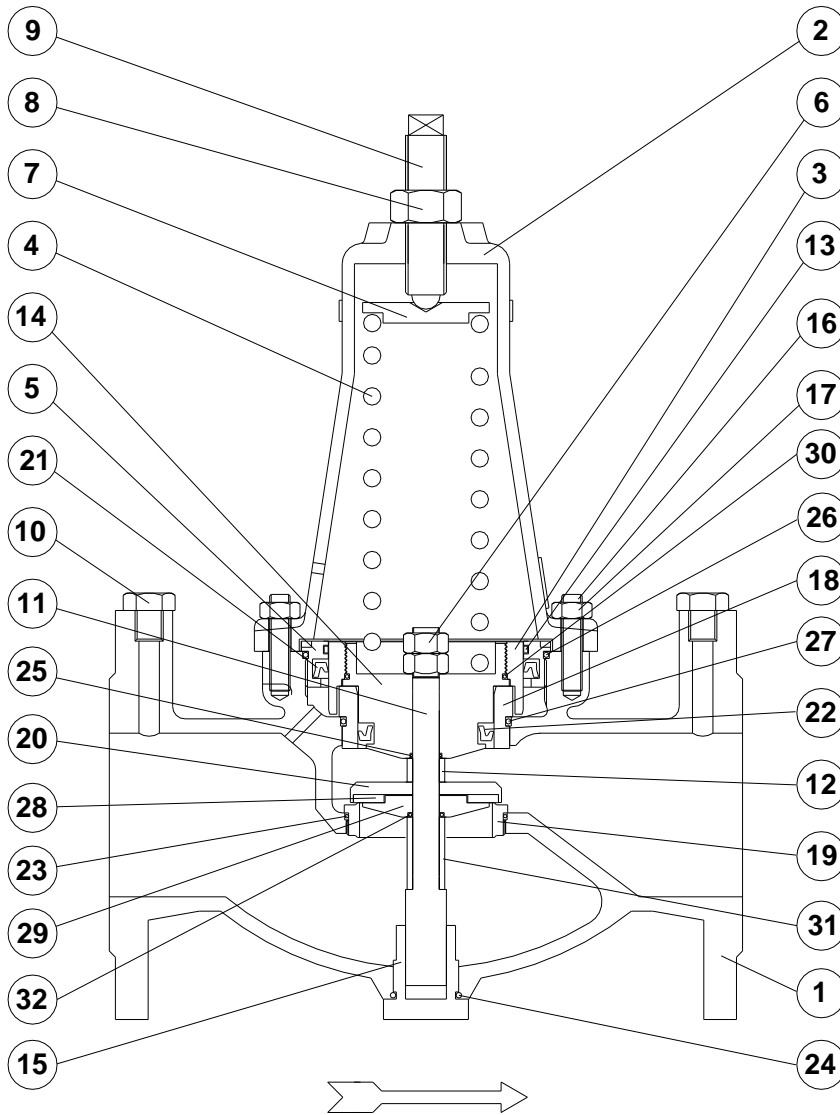
The flow rate is an effect of the pressure controlled by the VSM for that specific system. An inlet pressure value, maintained for an instance at 3 bar, wouldn't produce the same flow rate everywhere as it depends on the headloss between the valve itself and the final boundary conditions.

Direct acting PSV Mod. VSM

and static (no flow) conditions

Drawings

Picture 1



Pos.	Component	Material
1	Body	GJS 500-7 epoxy painted
2	Cover	GJS 500-7 epoxy painted
3	Piston	Bronze
4	Spring	Painted steel 52SiCrNi5
5	Upper ring	Stainless steel
6	Locking nuts	Stainless steel
7	Spring support	Brass
8	Regulation nut	Stainless steel
9	Regulation screw	Stainless steel
10	Pressure outlet tap	Stainless steel
11	Main shaft	Stainless steel
12	Central spacer	Stainless steel
13	Gasket	PTFE
14	Lower piston	Brass
15	Tap	Stainless steel
16	Studs	Stainless steel
17	Nuts and washers	Stainless steel
18	Lower ring	Bronze
19	Sealing seat	Stainless steel
20	Obturator	Stainless steel
21	Lip gasket	NBR
22	Lip gasket	NBR
23	O-ring	NBR
24	O-ring	NBR
25	O-ring	NBR
26	O-ring	NBR
27	O-ring	NBR
28	Plane gasket	Polyurethane
29	Gasket holder	Stainless steel
30	O-ring	NBR
31	Lower spacer	Stainless steel
32	O-ring	NBR

Gasket spare parts' list	
21-22-23-24-25-26-27-28-30-32	
Mobile block spare parts' list	
3-4-5-6-7-8-10-11-16-17-18-19-20-21-26	
Obturator spare parts' list	
3-6-11-12-14-20-22-25-28-29-31	

Recommended Spare parts nr: 13-21-22-23-24-25-26-27-28-30-32

Problems solving

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 upstream is above the set point	Check the pressure and adjust the screw acting on the spring turning it clock wise
	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 us technical literature
The valve doesn't open	The pressure upstream is below the set point	Check the pressure and adjust the screw acting on the spring by turning it anti clockwise
	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

Disassembly (to proceed with it is necessary to have the required spare keys and tools)

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

1. slowly close the upstream and downstream gate valves;
2. if the VSM 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. Failing in doing so 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. remove the driving tap (15) the hexagonal part of the main shaft (11) will be visible
7. push the mobile block from the shaft (11) downwards
8. set the hexagonal part with a wrench and keep it steady while unscrewing the first nut (6) holding the piston tight
9. unscrew the upper ring (5) pulling it out along with the upper and lower piston (3 and 14) which do not have to be separated
10. Push the piston out of the ring paying attention not to damage the lip gasket (21), o-ring (26) and the guiding PTFE ring (13)
11. Check the surface of the piston, clean it if necessary
12. Unscrew the lower ring (18) paying attention not to damage the o-ring (27)
13. Extract from above the spacer (12) and the o-ring (25)
14. Pull out the obturator block (20-28-29) paying attention not to damage the o-ring (32)
15. Check the surface of the plane gasket (28), replace if it necessary
16. check the downstream side of the reducer for possible sign of cavitation, holes

1) Reassembly

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

- 1) use a proper grease on the piston, lip gaskets to allow for the proper movement of the mobile block.
- 2) Once the valve has been fully assembled, prior to place the cover, check for the proper movement of the mobile block making sure there are not sign of friction or any other element affecting it.



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.