



CSA products for treated water

Fast acting relief valve

Mod. VRCA

Instructions

These instructions provide installation, operation and maintenance information for CSA fast acting relief valves Mod. VRCA. They are for use by personnel who are responsible for installation, operation and maintenance of CSA pressure control valves.

Safety Messages

All safety messages in the instructions are flagged with an exclamation symbol and the word Caution, Warning or Danger. These messages indicate procedures that must be followed exactly to avoid equipment damage, personal injury or death. Safety label(s) on the product indicate hazards that can cause equipment damage, personal injury or death.

If a safety sign or symbol becomes difficult to see or read, please contact us.



WARNING!

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves, which have been removed from service, with suitable protection for any potential pipeline material in the valve.

Inspection

Your CSA VRCA pressure relief valve has been packaged to provide protection during shipment; however, it can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

Parts

Recommended spare parts are listed on the assembly drawing. These parts should be stocked to minimize downtime. When ordering parts, please include the model, type and numbers located on the data plate placed on the valve. Also include the part name, the assembly drawing number, and the quantity stated on the assembly drawing.

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Description

The CSA VRCA fast acting relief valve is designed to protect pipelines against excessive overpressures. It is basically a direct acting spring loaded type valve which will open quickly when the system pressure exceeds setting of springs without generating sudden closures once the pressure goes back to normal. This type of air valve should not be considered as protection against negative pressure, which develop elsewhere in the system, for which other and different CSA models and solutions are available like combination air valves.

The CSA VRCA is held closed against normal line pressure by means of the spring force, preset at the factory and/or adjustable on the field according to the different spring range.

It should be set to the desired cracking pressure and in any case at least 1 bar above the steady state value, to avoid unwanted opening in working conditions.

Handling and Storage

Lifting the valve improperly may damage it. Lift the valve with slings, chains or cables fastened around the valve body, or fastened to bolts or rods through bolt holes in the flanges.

Do not use the regulation screw (nr 3 on page 8)

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.

Installation

The fast acting pressure relief valve CSA Mod. VRCA should always be installed in a vertical position. An isolation valve between this unit and the transmission (pipeline) system is necessary to allow maintenance and valve's inspection. Where to use:

- At the pumping stations downstream of check valves
- Close and upstream of butterfly, motorized valves, sectioning devices in general to absorb the increase in pressure caused during closure.
- At the dead ends of the system and whenever the pressure wave caused during transients can be reflected
- Upstream and downstream of critical segments of equipment, subject to frequent bursts, leakages and failures due to raise in pressure, old pipes.
- This model **should not be** placed at those points where vacuum and column separation can occur. For such cases the CSA air valves anti surge models FOX 3F-AS are suitable.

Note to Engineer: Thanks to the fast response VRCA is one quickest relief valves on the market, also due to the technical features and design details. Users has to consider that the CSA VRCA will discharge water to the atmosphere during opening phases caused by rise in pressure. A drainage system, whose section is normally greater that the valve nominal DN and depends on the pressure ratio, must always be created to avoid flooding.



CAUTION!

The amount of water discharge under pressure is proportional to the pressure and depends on the spring set point, do not open the sectioning device and do not supply pressure to the valve prior to the proper valve's setting. Do not stand below and close to the valve, the water discharged under pressure can cause personal injury or equipment damage

- 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 in a crisscross pattern and minimum of four stages.
- The pressure setting curve showing the cracking value versus the protrusion of the screw (ref nr 3 on drawing nr 1 on page..) is available on request
- The CSA VRCA is equipped with a pressure port (ref nr 18 on drawing 1 on page 8) used for the following purposes:
 - To install a pressure gauge for pressure measurement
 - To connect a manual pump and carry out a presetting on the field
 - To install a needle valve and create some flow in case of low temperatures with risk of frost

Fusion/Powder Coated Valves Maintenance



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.

The fast acting relief valve is automatic in operation and requires very little maintenance. It should always be installed in a vertical position. A semi-annual visual inspection for leakage is recommended. A malfunction can be identified by the seepage of water through the seat and /or through the pressure port (ref.nr 13 and 18 on drawing nr 1 on page 8) Should a malfunction occur, the following steps should be taken to repair the valve:

Disassembly Procedure

See Figures 1 on page 8 for part identification.

- Relieve pipeline pressure or shut off isolation valve before servicing the relief valve.
- Slowly remove the drain port (18) to relieve internal pressure



WARNING!

Servicing the relief valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the VRCA.

- Remove cap nuts (19) and cap (2).
- Before relieving the spring measure the protrusion of the screw (3) from the nut
- Completely relieve the spring by turning the driving screw (3) anticlockwise
- Remove screws (16) and washers (17)



WARNING!

Do not completely remove cover screws, and do not completely relieve the spring (6) through the screw (3) while the valve is under pressure.

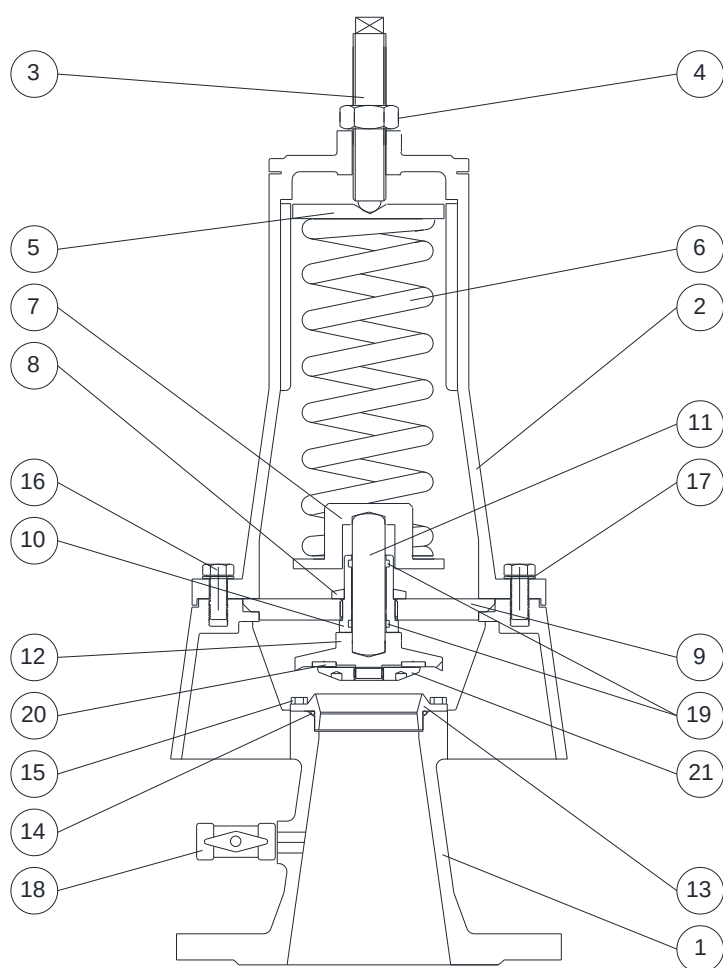
- Extract the cover (2)

- Pull out the spring support (5), spring (6) and spring housing (7)
- Check and inspect the spring for possible sign of corrosion which may be triggered by possible flooding of the installation chamber
- Pull out the shaft (11) and inspect the surface making sure it hasn't been damaged, scratched
- Remove the separation plate (9) and secure it in the vise, then unscrew the driving sleeve (10) making sure the guiding rings (19) haven't been damaged and the internal surface remained perfectly smooth without any layer of dirt and accumulation
- Take the obturator block composed of obturator (12), gasket holder (21) and plane gasket (20)
- Check the plane gasket (20) for possible sign of wearing, scratching, deformation and damages
- Should a replacement be needed put the obturator block in a vise, unscrew the gasket holder (21) by using the available holding points
- Inspect the sealing seat (13) surface looking for possible damages, scratching
- Should a replacement be needed put the body (1) in a vise, unscrew the seat (13) by using the available holding points and paying attention not to damage the o.ring (14)

Assembly procedure

Repeat and follow the above mentioned steps backwards, contact us for further assistance

Drawing



N.	Component	Material
1	Body	GJS 500-7 or GJS 450-10
2	Cap	GJS 500-7 or GJS 450-10 and painted steel
3	Driving screw	AISI 304/AISI 316
4	Nut	AISI 304/AISI 316
5	Spring support	AISI 303 (304 from DN150)/AISI 316
6	Spring	52SiCrNi5
7	Spring housing	AISI 303 (304 from DN150)/AISI 316
8	Ring	AISI 304/AISI 316
9	Separation plate	AISI 304 (painted steel from DN150)/AISI 316
10	Driving sleeve	Delrin polyoxymethylene (AISI 304 from DN150)
11	Shaft	AISI 304/AISI 316
12	Obturator	AISI 303 (304 from DN150)/AISI 316
13	Sealing seat	AISI 304 (303 for DN50/65)/AISI 316
14	O-ring	NBR/EPDM/Viton
15	Screws (from DN150)	AISI 304/AISI 316
16	Screws	AISI 304/AISI 316
17	Washers	AISI 304/AISI 316
18	Ball valve 1/4"	nickel-plated brass/AISI 316
19	Guiding rings	PTFE
20	Gasket	NBR
21	Gasket holder	AISI 304/AISI 316

Spare parts: 14-19-20

The list of materials and components is subject to changes without notice.

Troubleshooting (ref picture 1 on page 8)

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.
Valve leaks out of the main sealing seat (13)	Valve is not vertical	Place the valve in a vertical position
	Possible corrosion through the body and seat	Check the fluid chemicals parameters and contact us
	Dirt accumulated between the seat (13) and the plane gasket (20)	Clean seat surface (13), plane gasket (20) and replace if necessary
	Line pressure is above the spring set point	Check the line pressure versus the spring adjustment curve, charge the spring by turning the screw (3) clockwise
	The plane gasket (20) and/ or the o-ring (14) has been damaged, scratched or scraped	Check the o.ring and plane gasket and replace it if necessary
Valve leaks out of the pressure port (18)	The isolation ball valve hasn't been threaded and secured properly and/or without loctite and other threadlockers devices	Remove the ball valve and out it back by using teflon, loctite, and other threadlocking solutions



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.