RF VALVES

VENT-O-MAT®

IOM MANUAL

Installation, Operation and Maintenance Manual

RBXc Air Release Valve

Vent-O-Mat is the world leader in air valve technology.

Series RBXc

SURGE & WATERHAMMER PROTECTION

Introduction

The Vent-O-Mat Series RBXc “Anti-Shock” air release and vacuum break valve, is the product of extensive research into the development of an efficient, but cost effective solution to surge problems (both mass liqiud oscillation and elastic transient phenomena) associated with any operating pipeline. Automatic dampening, relevant to the pipeline’s needs is provided by either one of two design features. These special features are unique in a pipeline component of such compact and economic design.

Surge Protection- Initial Filling

The RBXc incorporates the additional floating “Anti-Shock” Orifice which is aerodynamically engineered to throttle air discharge when water approach velocity would otherwise become too great and induce an unacceptable pressure rise. The air throttling action increases resistance to the flow of the approaching water which consequently decelerates to a velocity which reduces the pressure rise when the valve closses. Vent-O-Mat series RBXc is an essential precaution for pipeline priming.

Surge Protection -Pump Trip Conditions

In instances where a pipeline experiences water column seperation due to pump stoppage, high shock pressures can be generated when the separated water column rejoins.

The Vent-O-Mat series RBXc takes in air through the unobstructed large orifice when water column separation occurs, but controls the discharge of air through the “Anti-Shock” Orifice as the separated column commences to rejoin. The rejoining impact velocity is thereby considerably reduced to alleviate high surge pressures in the system.

Other surge control measures may, dependant on pipeline profile, diameter and operating conditions, be needed to provide the primary surge alleviation function with the Vent-O-Mat air valves forming and integral and valuable addition in a combined strategy for further reducing surge pressures. The benefit of the “Anti-Shock” Orifice can be readily demontrated by suitable surge modeling software.

Surge Protection-Pipeline Operating

The operation of valves and similar flow control devices can cause high-pressure transients in an operating pipeline.

The unique, single chamber design of the Vent-O-Mat series RBXc valve enables a pocket of air to be trapped in the valve chamber. Automatic operation of the small orifice control float regulates the volume of air entrapped.

The volume mainted in the valve will provide a cushioning benefit to the pipeline for short duration transient pressure “spikes”. This effect can be modelled by the design engineer using suitable surge software.

Computer Modelling

The effectiveness of Vent-O-Mat RBXc has been substantiated by independent third party testing and by thousands of applications globally. Effective computer modelling, based on practical tests, has been ensured in the well-known and respected commerically available **SURGE 2000** surge analysis software programme. Accurate results are also obtained by other commercially available surge analysis software programmes such as FLOWMASTER and TRANSAM.

Holistic Surge & Water Hammer Protection

Vent-O-Mat forms an integral part of a well planned, holistic surge protection strategy that should, according to application needs and financial constraints, include surge vessels, check valves, control valves and/or any other equipment needed to alleviate unacceptable surge behaviour.

Technical and Financial Benefits

The Vent-O-Mat series RBXc valve offers definite financial and technical advantages when incorporated as part of a holistic surge protection startegy. This includes:

1. Improved alleviation of surge behaviour including reduction of:
   - Surge pressure magnitudes by slowing surge velocities
   - Duration of oscillation following a pump trip, as the air-valve continuously absorbs and dissipates the energies of the surge.

2. Potential for reduction in size and/or quantity of conventional surge protection devices such as surge vessels etc.

3. Automatic protection during initial filling when most surge protection devices such as surge protection devices are not operational.

4. Holistic protection as each air valve installed has design features to automatically damp surges.

5. The valve is virtually maintenance free.

Service

Vent-O-Mat is committed to finding the most cost effective and efficient solution to pipeline complexities. Services include air valve sizing and positioning and assistance to consulting engineers on defining appropriate surge and water hammer protection startegies. Vent-O-Mat has built a sound relationship with many international consulting firms and has gained global recognition for selling solutions!

Series RBXc
Why?

- **“ANTI-SHOCK” - “ANTI-SURGE” -** The RBXc is the only air release valve available that is supplied as standard with a mechanism which operates automatically to prevent pipeline damage from the high induced pressure transients associated with high velocity air discharge. Surge resulting from liquid column separation and liquid oscillation is dramatically reduced as an automatic function of this mechanism.

- **PERFORMANCE -** The RBXc has been designed and developed to provide the optimum usable and safe performance relative to all functions. Selection data has been substantiated through CSIR and other testing and can therefore, be confidently refrenced.

- **QUALITY -** The RBXc economically offers the highest quality construction and materials available in and air release and vacuum break valve. Stringent manufacturing and test
- procedures are maintained to ensure the best possible service and reliability is given by every valve produced.

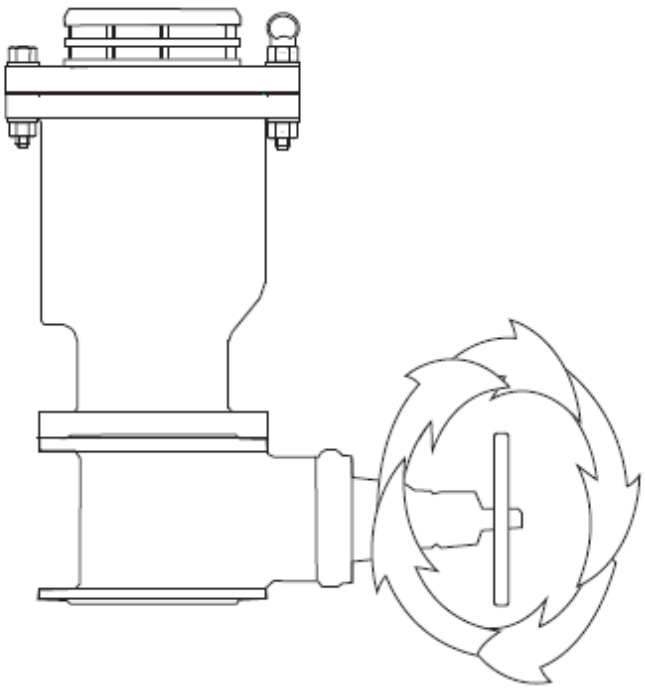
- **SERVICEABILITY** - The RBXc design facilitates extreme ease of service and maintenance. Compnents are in corrosion free materials to allow problem free disassembly and reassembly even after many years of operation. All maintenance spares are replaceable without special tools or skills.

- **VACCUM BREAK** - The RBXc series large orficie diameters equal the nominal size of the valve, i.e, a 200mm (8") orfice. This ensures the least possible resistance to the intsake of air and consequently the least possible negative pressure within a draining pipeline.

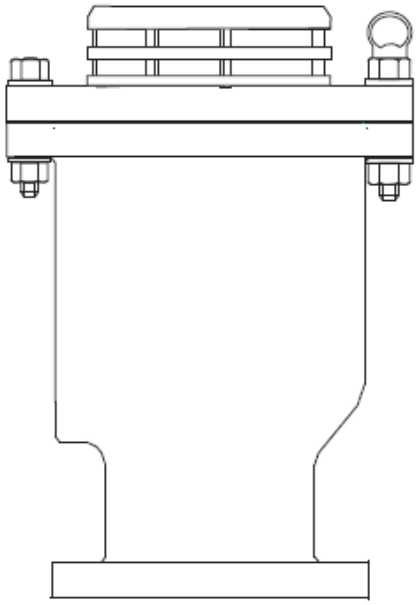
- **COMPACTNESS** - Although extremely robust the RBXc valve's lightweight and compact construction offers handling transport and installation advantages.

- **BACK UP** - Vent-O-Mat provides highly committed customer orientated sales, service, spares and technical back up- TRY US!!!

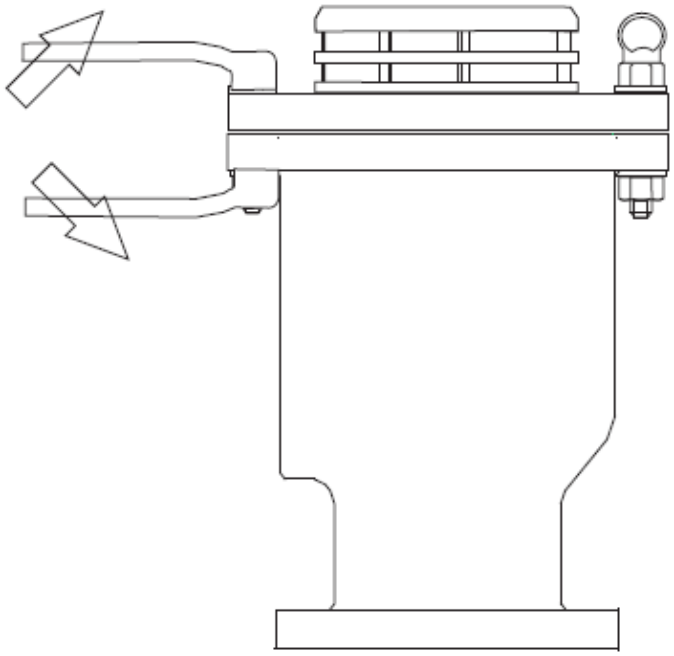
MAINTENANCE



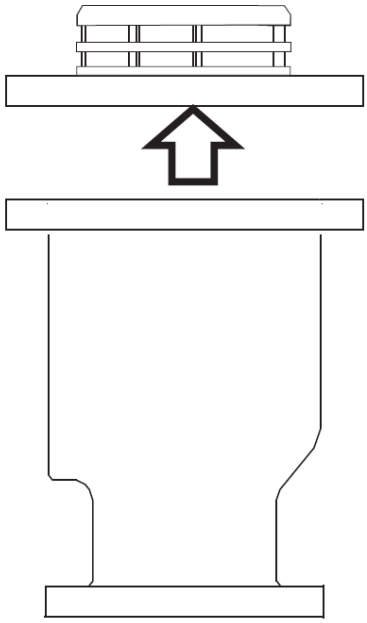
Step One: Isolate Air Valve



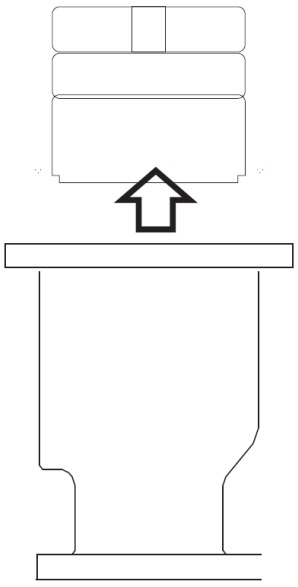
Step Two: Before removing the top flangeassembly ensure any excess pressure that may be trapped within the Valve body is be safely released ensure that the main Isolator is fully closed before doing this.



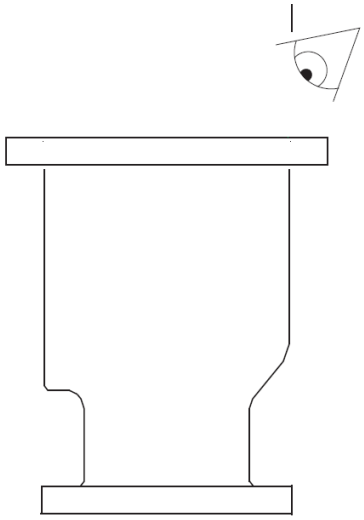
Step Three: Loosen nuts and bolts.



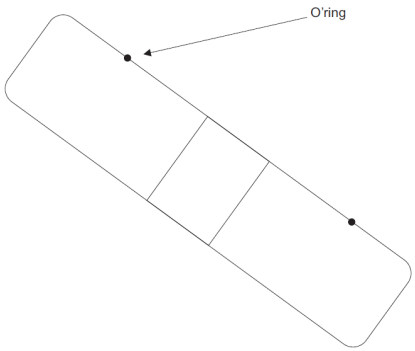
Step Four: Remove Top flange assembly



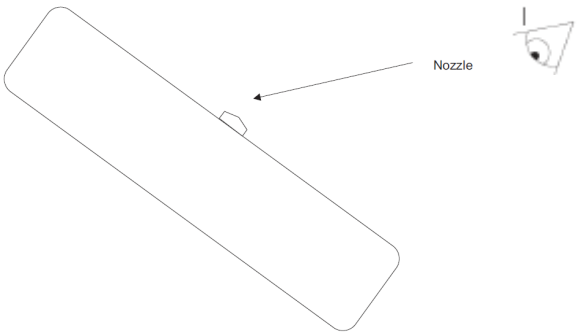
Step Five: Remove Floats from Valve Body



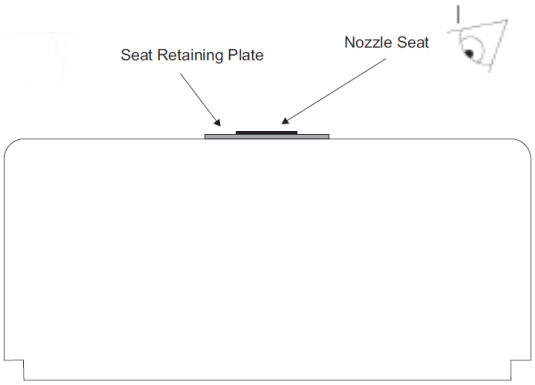
Step Six: Check that the internals of the valve body are free from debris



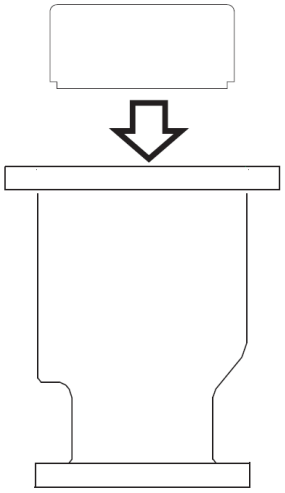
Step Seven: Check the O’ring on the “Anti-Shock float for damage replace with O’ring in spares kit if necessary.



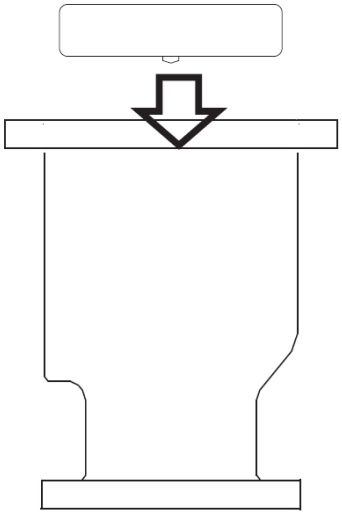
Step Eight: Checks the nozzle and ensure it isn’t blocked or damaged if blocked clear with small wire. If damaged remove from float using a spanner and replace with Nozzle supplied in spares kit.



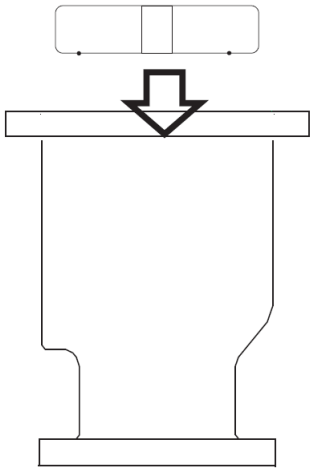
Step Nine: Checks the nozzle seat for damage if any damage is apparent replace with replacement seat from Spares kit supplied by manufacturer. In order to replace the nozzle seat Remove the Nozzle Seat retaining plate using a flat screwdriver to unscrew the screws and remove the Nozzle seat. Screw back the nozzle seat retaining plate once the new seat is in place.



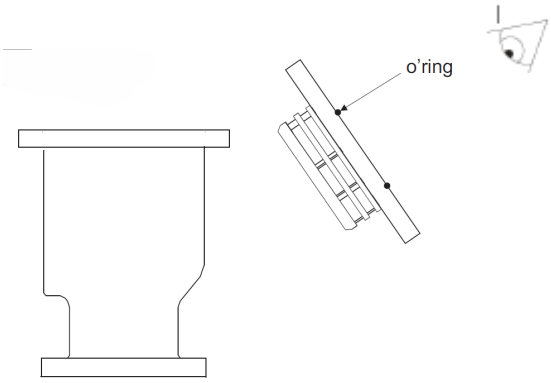
Step Ten: Replace lower float making sure that the lip on the float touches the baffle plate at the bottom of the valve and the Nozzle seat is facing upwards.



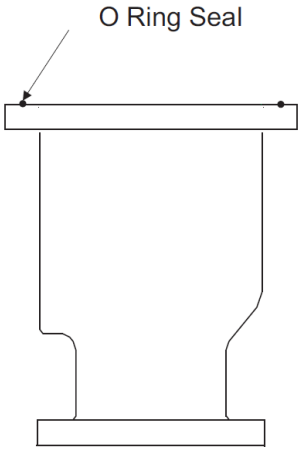
Step Eleven: Replace the Upper float/ small orifice float Making sure Nozzle is facing down and the flat face is facing up.



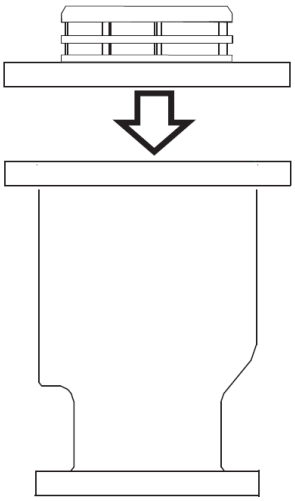
Step Twelve: Replace the “Anti-Shock” Float ensuring that the O-ring faces downwards and flat surface of the float faces upwards.



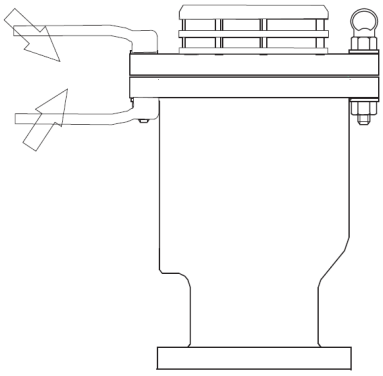
Step Thirteen: Check o’ring in top flange assembly for damage and replace with O’ring from spares kit if necessary.



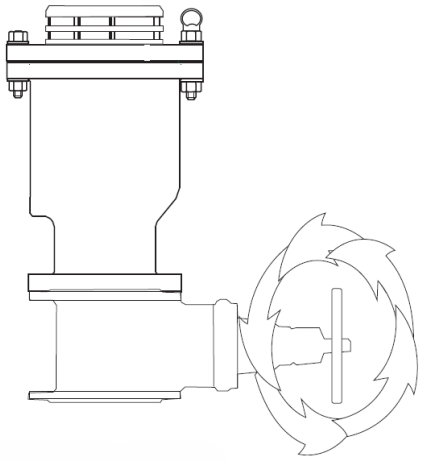
Step Fourteen: Check o’ring seal for damage and replace with spare O’ring Seal provided in spares kit if necessary. Make sure that it is properly placed in the groove before fitting Top flange assembly.



Step Fifteen: Replace top flange assembly making sure not to disrupt the O'ring groove.



Step Sixteen: Replace nights and bolts nuts and bolts must be cross tightened.



Step Seventeen: Open Isolating Valve.