VENT-O-MAT®

SERIES RBX
Series RBXb

AIR RELEASE VALVES

OWNER'S MANUAL

SPECIFICATIONS AND
OPERATION MANUAL

Name:

Company: Department:

Address:

Tel: Fax:

Project:

Air Valve Details:

VENT-O-MAT®

SERIES RBX "ANTI-SHOCK" AIR VALVE

OWNER'S MANUAL

INTRODUCTION

Thank you for your purchase of the Vent-O-Mat series RBX "Anti-Shock" air valve. This air valve design is the culmination of years of intensive research, innovative design and leading edge technology.

The Vent-O-Mat series RBX air valve has transcended the line of being a mere air valve or surge alleviation mechanism as it represents more than just the combination of these functions. In fact, it is best described as a cost effective pipeline management system incorporating the features of a double acting air valve and surge alleviation device.

This manual is intended to provide the project engineer, contractor and end user with a useful guide on how best to install operate, maintain and maximise the performance of the Vent-O-Mat series RBX air valve. Included are comments on air valve sizing and positioning, Vent-O-Mat testing procedures and useful technical data.

Note this document is specifically directed at the use of Vent-O-Mat series RBX air valves and is not intended as a comprehensive pipeline design guide or system engineering manual.

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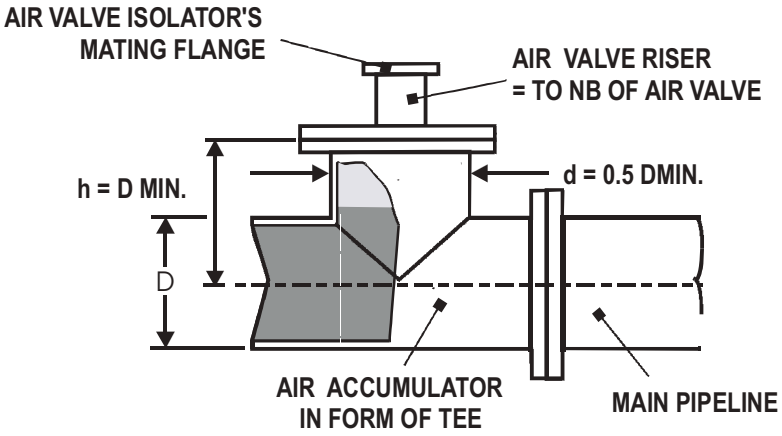
RECOMMENDED INSTALLATION ARRANGEMENTS

Air Accumulators

It is common practice amongst some design engineers to place an air valve on a riser welded directly onto the main pipeline. This method however leads to inefficient air valve operation and restrictions in the main pipeline as air that is taken in under vacuum conditions will be swept away when the pumps are restarted. It is good pipeline design practice, to provide an accumulator, as indicated below for every air valve, to facilitate efficient air valve operation.

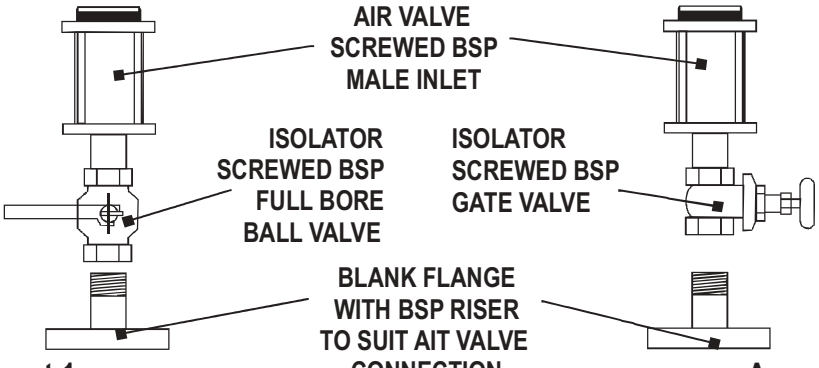


Isolator Arrangements

Every air valve installed, should have an isolator installed directly underneath it to allow the removal of the air valve in case of repairs. Indicated on the enclosed diagrams are Vent-O-Mat's recommended installation arrangements.

Arrangements 1 & 2

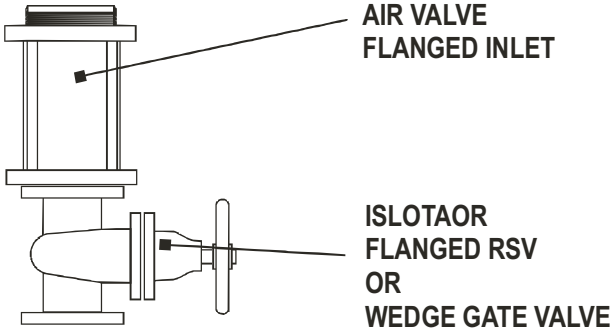
Specific to DN25 & DN50 Vent-O-Mat Series RBX valves.



Arrangement 1 **Arrangement 2**

Arrangement 3

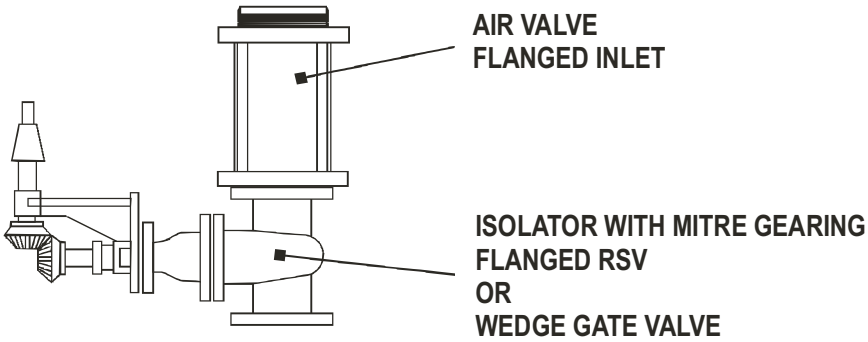
Specific to DN80,100,150 and 200 valves - Recommended for valves not installed in a valve chamber. Either a Wedge Gate or a Resilient Seal Valve can be utilised.



Arrangement 3

Arrangement 4

Specific to DN80,100,150 and 200 valves - Recommended for valves installed inside a valve chamber, to be operated by a Tee Key.



Arrangement 4

Air Valve Chamber Design

A well designed air valve chamber is important and should be designed with easy access to the valve for installation and subsequent maintenance. Good support is required in the case of chamber settling. It is a common practice to place a layer of stone underneath the pipe for drainage purposes. Two vents should also be installed, in the manner indicated on the opposite page to allow free and constant air circulation.

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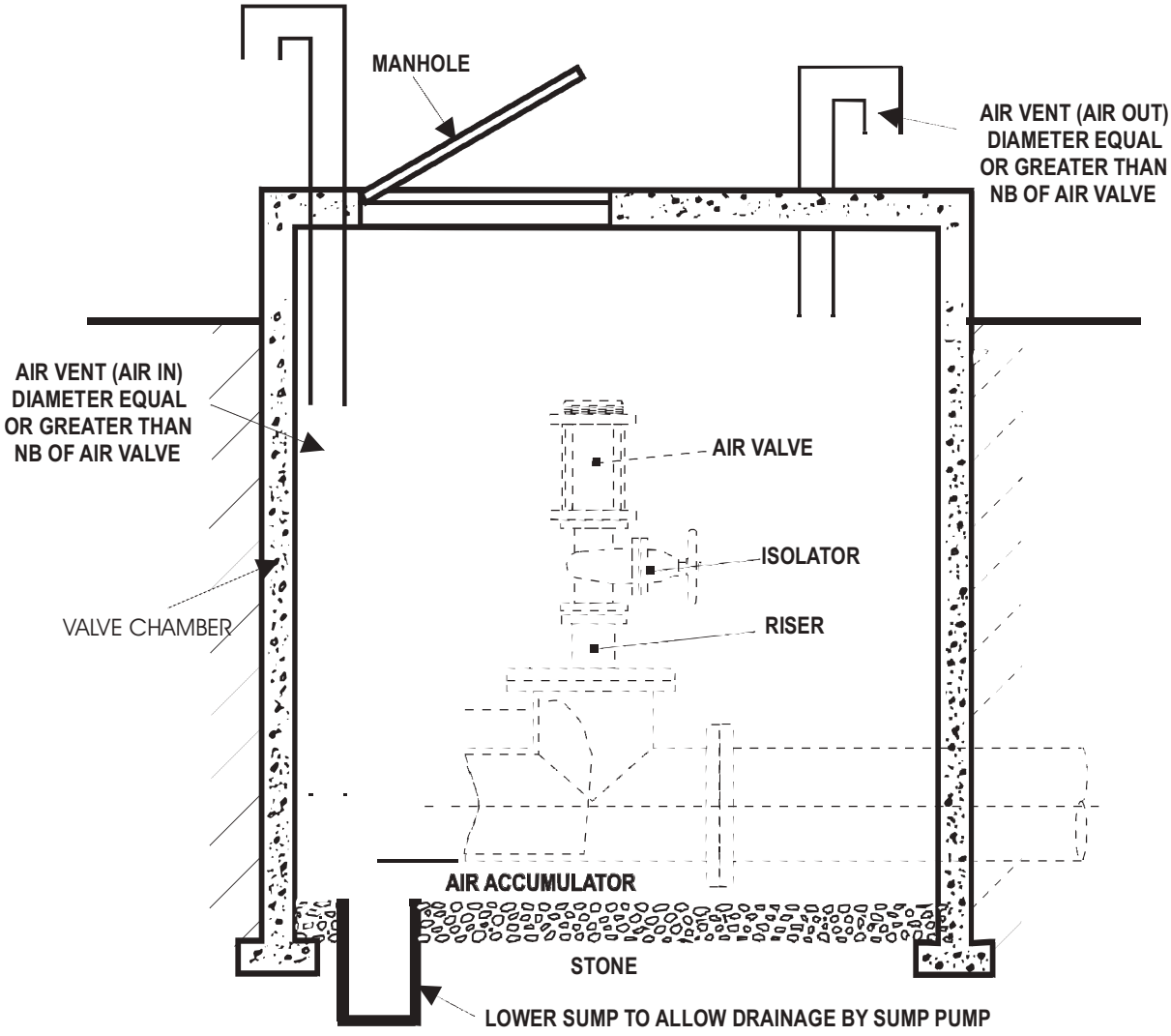

AIR VALVE CHAMBER

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Series RBX

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION

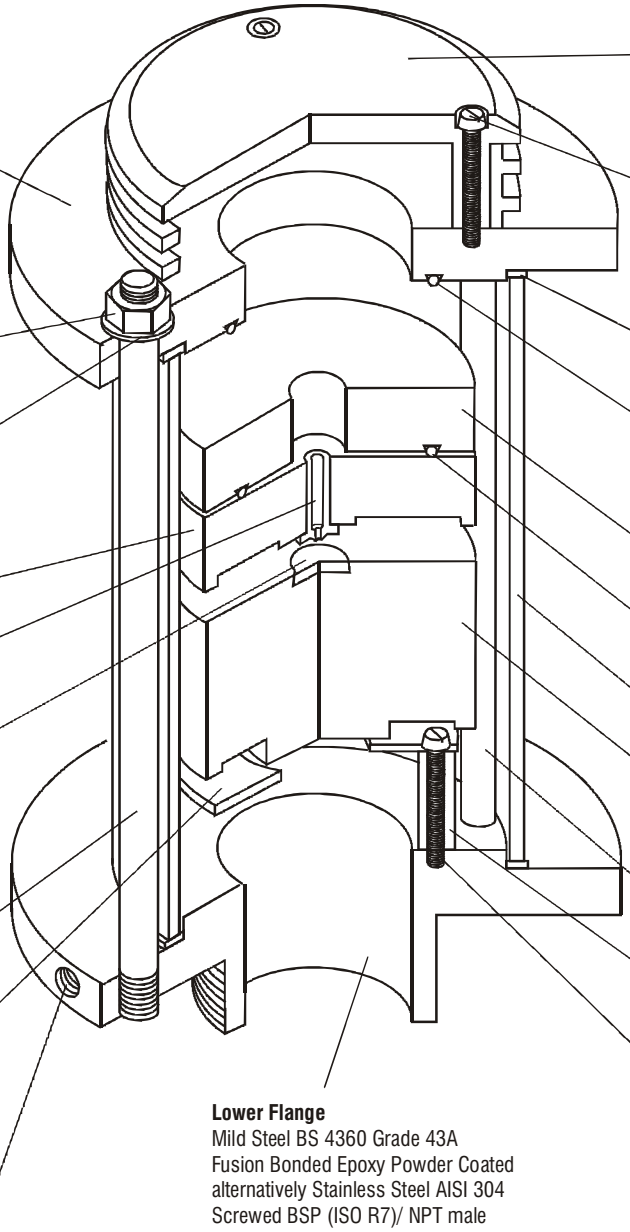
SCREWED - DN25(1") & DN50(2")

Type:
Series RBX - Double Orifice (Small & Large Orifice) with Anti Shock Orifice Mechanism.

End Connection:
Screwed BSP (ISO R7)/ NPT Male

Nominal Sizes:
DN25 (1")
DN50 (2")

Model No's:	Pressure Ratings:
RBX 2511 & 2521	PN25 (363 psi)
RBX 4011 & 4021	PN40 (580 psi)



Top Flange
Mild Steel BS 4360 Grade 43A
Fusion Bonded Epoxy Powder Coated
alternatively
Stainless Steel AISI 304

Screen Mesh
Stainless Steel AISI 304

Nuts
Stainless Steel AISI 304

Washer
Stainless Steel AISI 304

Top Float
High Density Polyethylene

Nozzle
Stainless Steel AISI 304

Nozzle Seat
EPDM Rubber

Tie Rods
Stainless Steel AISI 304

Baffle Plate
Stainless Steel AISI 304

Optional Test Cock Connection
¼" BSP/ NPT Female

Top Cover
ABS Polylac PA737

Assembly Screws
Cheesehead
Stainless Steel AISI 304

Barrel Seal
Klingersil C4430
Gasket

O - Ring Seal
EPDM Rubber

Anti Shock Orifice
High Density Polyethylene

O - Ring Seat
EPDM Rubber

Barrel
Stainless Steel AISI 304L

Lower Float
High Density Polyethylene

Float Guide
Stainless Steel AISI 304

Baffle Plate Spacer
ABS Polylac PA737

Support Screw
Cheesehead
Stainless Steel AISI 304

Lower Flange
Mild Steel BS 4360 Grade 43A
Fusion Bonded Epoxy Powder Coated
alternatively Stainless Steel AISI 304
Screwed BSP (ISO R7)/ NPT male

Valves are available in AISI 316L on request.

information subject to change without prior notice

VENT-O-MAT®

Series RBX

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION

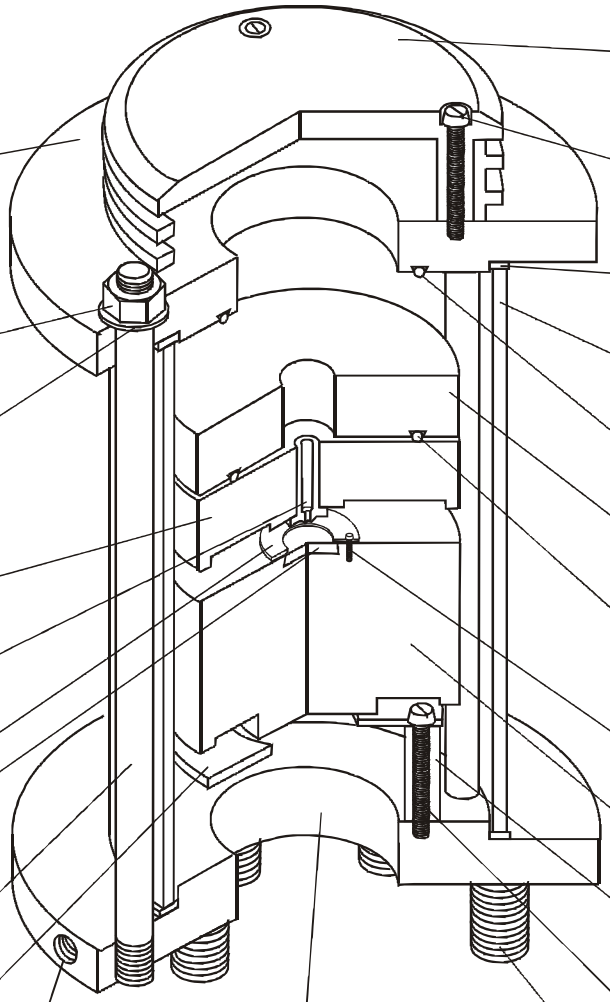
FLANGED - DN80(3") & DN100(4")

Type:
Series RBX - Double Orifice (Small & Large Orifice) with Anti Shock Orifice Mechanism.

End Connection:
Flange with screwed studs.

Nominal Sizes:
DN80 (3")
DN100 (4")

Model No's:	Pressure Ratings:
RBX 1601 & 1631	PN16 (232 psi)
RBX 2501 & 2531	PN25 (363 psi)
RBX 4001 & 4031	PN40 (580 psi)



Top Cover
ABS Polylac PA737

Top Flange
Mild Steel BS 4360 Grade 43A
Fusion Bonded Epoxy Powder Coated
alternatively Stainless Steel AISI 304

Assembly Screws
Cheesehead
Stainless Steel AISI 304

Barrel Seal
Klingersil C4430
Gasket

Nuts
Stainless Steel AISI 304

Barrel
Stainless Steel AISI 304L

Washer
Stainless Steel AISI 304

O - Ring Seal
EPDM Rubber

Top Float
High Density Polyethylene

Anti Shock Orifice
High Density Polyethylene

Nozzle
Stainless Steel AISI 304

O - Ring Seat
EPDM Rubber

Nozzle Seat Retaining Plate
Stainless Steel AISI 304

Connecting Screws
Cheesehead
Stainless Steel AISI 304

Nozzle Seat
EPDM Rubber

Lower Float
High Density Polyethylene

Tie Rods
Stainless Steel AISI 304

Baffle Plate Spacer
ABS Polylac PA737

Baffle Plate
Stainless Steel AISI 304

Support Screw
Cheesehead
Stainless Steel AISI 304

Optional Test Cock Connection
¼" BSP/ NPT Female

Lower Flange
Mild Steel BS 4360 Grade 43A
Fusion Bonded Epoxy Powder Coated
alternatively Stainless Steel AISI 304

Studs
Stainless Steel AISI 304L

Valves are available in AISI 316L on request.

information subject to change without prior notice

VENT-O-MAT®

Series RBX

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION

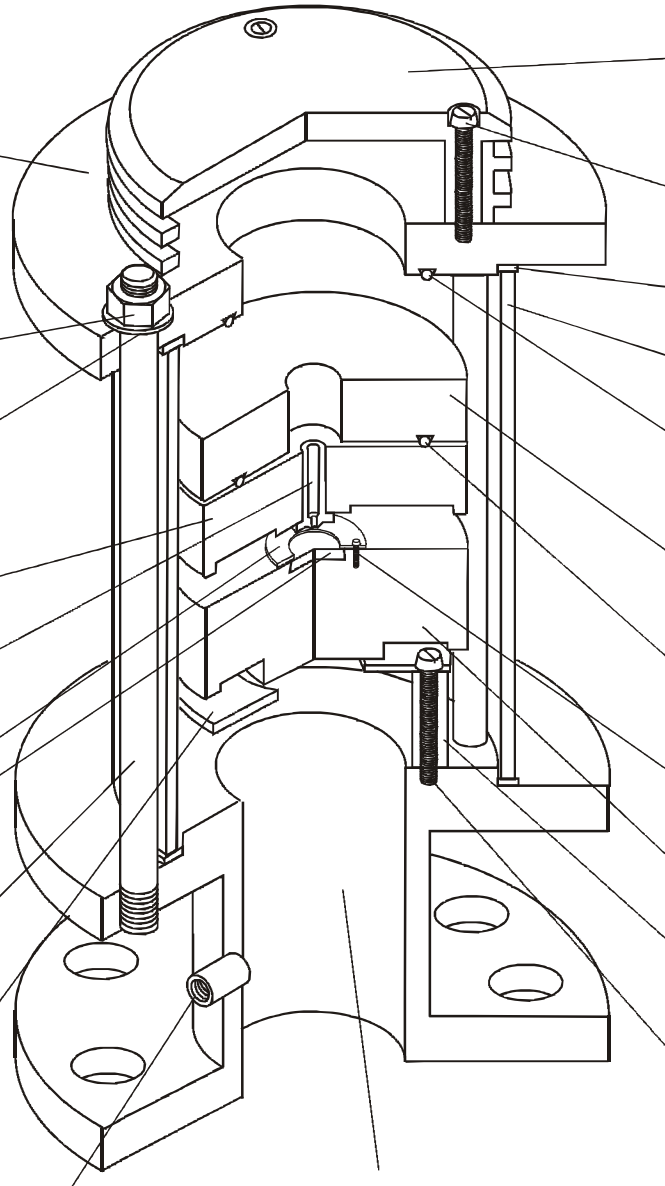
FLANGED - DN150(6") & DN200(8")

Type:
Series RBX - Double Orifice (Small & Large Orifice) with Anti Shock Orifice Mechanism.

End Connection:
Flange with screwed studs.

Nominal Sizes:
DN150 (6")
DN200 (8")

Model No's:	Pressure Ratings:
RBX 1601 & 1631	PN16 (232 psi)
RBX 2501 & 2531	PN25 (363 psi)
RBX 4001 & 4031	PN40 (580 psi)



Top Flange
Mild Steel BS 4360 Grade 43A
Fusion Bonded Epoxy Powder Coated
alternatively Stainless Steel AISI 304

Nuts
Stainless Steel AISI 304

Washer
Stainless Steel AISI 304

Top Float
High Density Polyethylene

Nozzle
Stainless Steel AISI 304

Nozzle Seat Retaining Plate
Stainless Steel AISI 304

Nozzle Seat
EPDM Rubber

Tie Rods
Stainless Steel AISI 304

Baffle Plate
Mild Steel BS 4360 Gr. 43A
Fusion Bonded Epoxy Powder Coated.

Optional Test Cock Connection
¼" BSP/ NPT Female

Lower Flange Assembley
Mild Steel BS 4360 Grade 43A
Fusion Bonded Epoxy Powder Coated
alternatively Stainless Steel AISI 304

Top Cover
ABS Polylac PA737

Assembly Screws
Cheesehead
Stainless Steel AISI 304

Barrel Seal
Klingersil C4430
Gasket

Barrel
Stainless Steel AISI 304L

O - Ring Seal
EPDM Rubber

Anti Shock Orifice
High Density Polyethylene

O - Ring Seat
EPDM Rubber

Connecting Screws
Cheesehead
Stainless Steel AISI 304

Lower Float
High Density Polyethylene

Baffle Plate Spacer
ABS Polylac PA737

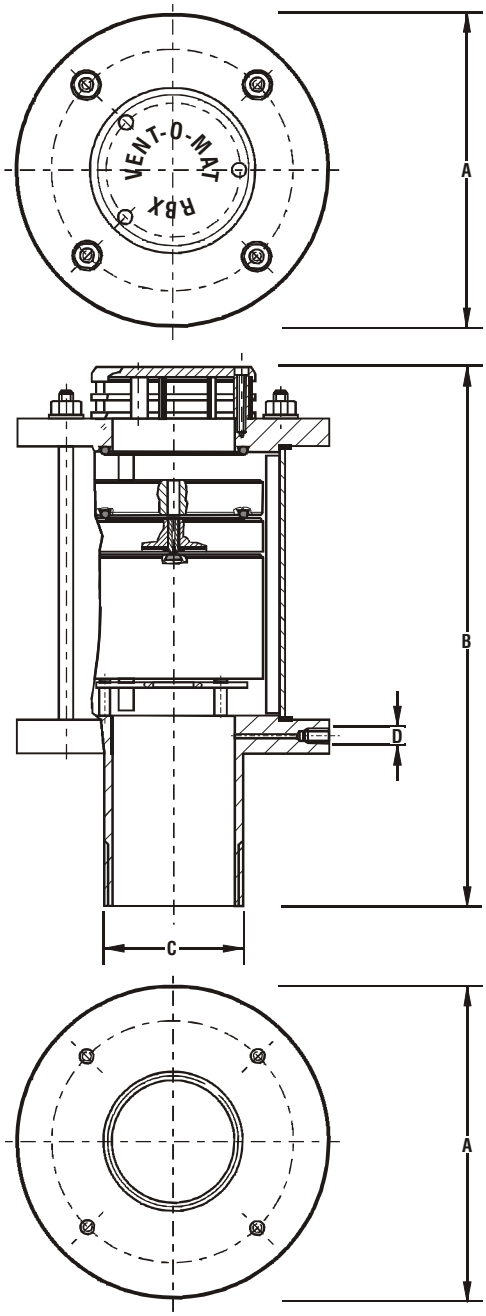
Support Screw
Cheesehead
Stainless Steel AISI 304

Valves are available in AISI 316L on request.

information subject to change without prior notice

GENERAL SPECIFICATIONS

SCREWED - DN25(1") & DN50(2")



Type:
Double Orifice (Small & Large Orifice) with Anti-Shock Orifice Mechanism.

End Connection:
Screwed BSP/ NPT Male

Nominal Sizes:
DN25 (1") & DN50 (2")

Model No's:	**Pressure Ratings bar (psi):**
RBX 2511	PN 25 (363 psi)
RBX 4011	PN 40 (580 psi)

Operating Pressure Range - bar (psi):

	Min.	**Max.**
PN25 (363 psi)	0.5 (7.25)	25 (363)
PN40 (580 psi)	0.5 (7.25)	40 (580)

Operating Temperature Range:
4°C (40°F) to 80°C (176°F)

Acceptable Media:
Potable or strained raw water.

Function:
i) High volume air discharge - pipeline filling.
ii) High volume air intake - pipeline draining
iii) Pressurized air discharge - pipeline filled.
iv) Surge dampening - high velocity air discharge, water column separation & liquid oscillation.

Materials of Construction: - see page 4

Installation:- see page 3

Standard Factory Tests:
i) Hydrostatic - 1.5 x max. rated working pressure
ii) Low head leak - 0.5 bar (7.25 psi)
iii) Small orifice function at max. rated working pressure (minimum 1 valve in 10).

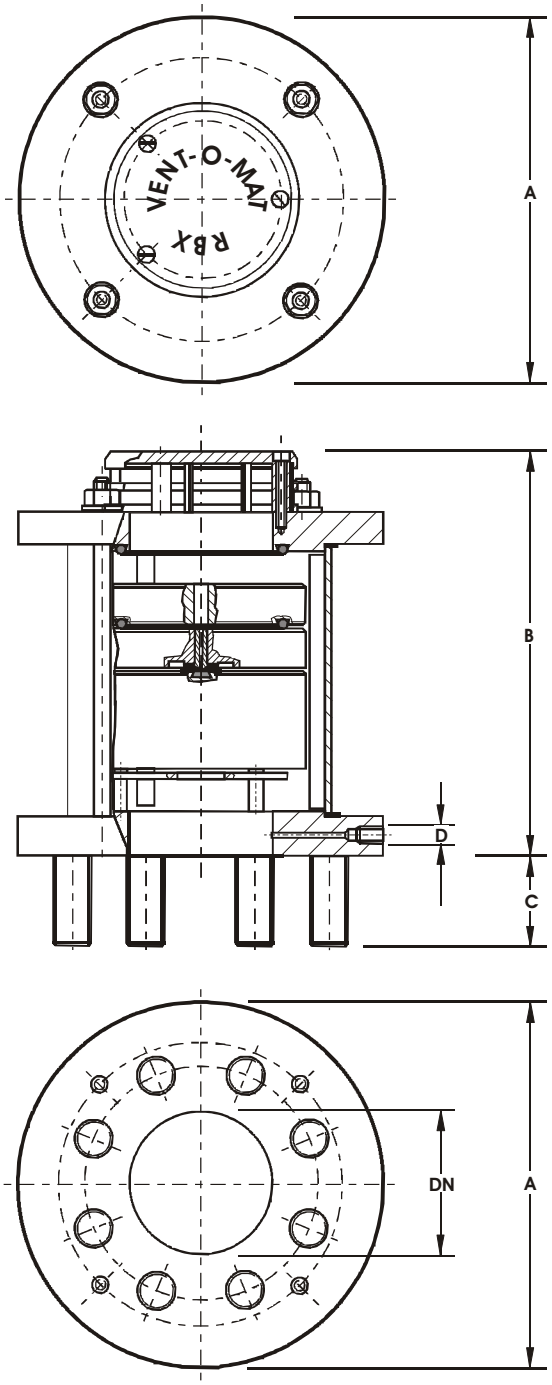
OVERALL DIMENSIONS & WEIGHTS

DN mm	DN in.	MODEL No.	PRESSURE RATING	A mm	A in.	B mm	B in.	C	D	WEIGHT kg.	WEIGHT lbs
25	1"	025RBX 2511 &2521	PN25 (363 psi)	120	4 3/4	265	10 7/16	1"BSP/ NPT	OPTIONAL ¼" BSP/NPT BLEED PORT FOR TEST COCK	5	11
25	1"	025RBX 4011 &4021	PN40 (580 psi)	120	4 3/4	317	12 1/2	1"BSP/ NPT		5.5	12.2
50	2"	050RBX 2511 &2521	PN25 (363 psi)	165	6 1/2	325	12 8/10	2"BSP/ NPT		9.5	21
50	2"	050RBX 4011 &4021	PN40 (580 psi)	165	6 1/2	340	13 6/16	2"BSP/ NPT		10	22

VENT-O-MAT®

Series RBX

GENERAL SPECIFICATIONS
FLANGED - DN80(3") & DN100(4")



Type:
Double Orifice (Small & Large Orifice) with Anti-Shock Orifice Mechanism.

End Connection:
Flange with Screwed Studs for Alignment to;
BS 4504 PN10, PN16, PN25 & PN40
SABS 1123 - Tables 1000/3, 1600/3, 2500/3 & 4000/3
ANSI B16.5 Class 150 & 300

Nominal Sizes:
DN80 (3") & DN100 (4")

Model No's:	**Pressure Ratings bar (psi):**
RBX 1601 & 1631	PN 16 (232 psi)
RBX 2501 & 2531	PN 25 (363 psi)
RBX 4001 & 4031	PN 40 (580 psi)

Operating Pressure Range - bar (psi):

	Min.	**Max.**
PN16 (232 psi)	0.5 (7.25)	16 (232)
PN25 (363 psi)	0.5 (7.25)	25 (363)
PN40 (580 psi)	0.5 (7.25)	40 (580)

Operating Temperature Range:
4°C (40°F) to 80°C (176°F)

Acceptable Media:
Potable or strained raw water.

Function:
i) High volume air discharge - pipeline filling.
ii) High volume air intake - pipeline draining
iii) Pressurized air discharge - pipeline filled.
iv) Surge dampening - high velocity air discharge, water column separation & liquid oscillation.

Materials of Construction: - see page 5

Installation: - see page 3

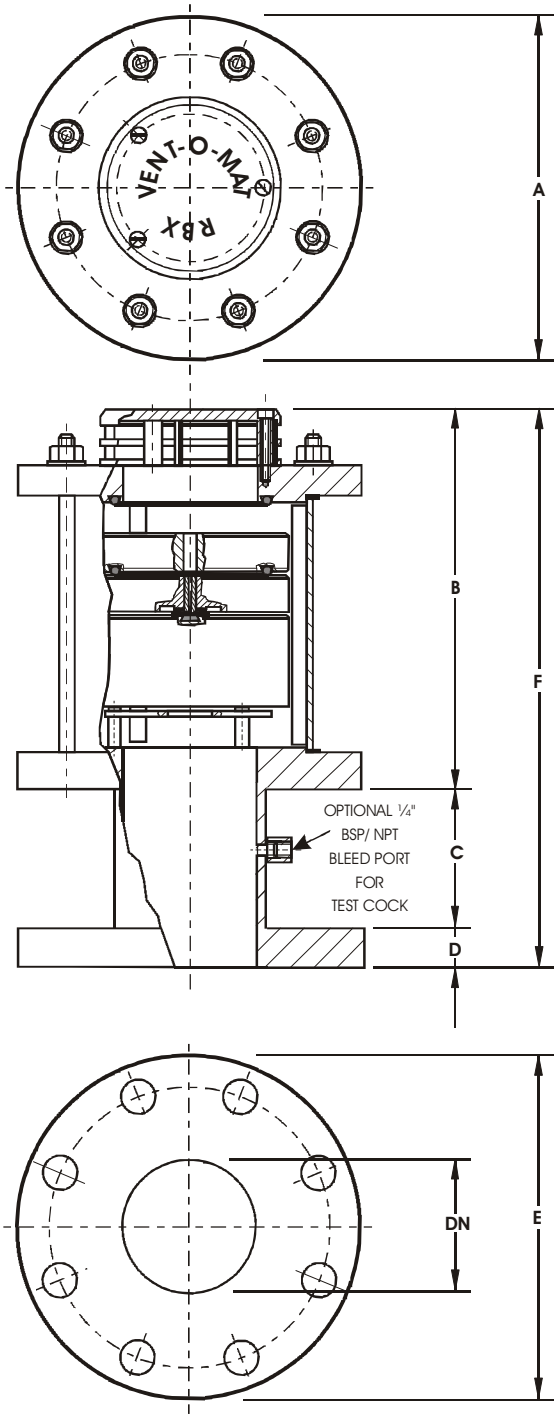
Standard Factory Tests:
i) Hydrostatic - 1.5 x max. rated working pressure
ii) Low head leak - 0.5 bar (7.25 psi)
iii) Small orifice function at max. rated working pressure (minimum 1 valve in 10).

OVERALL DIMENSIONS & WEIGHTS

DN		MODEL No.	PRESSURE RATING	A		B		C		D	WEIGHT	
mm	in			mm	in	mm	in	mm	in		kg.	lbs
80	3	080 RBX 1601 & 1631	PN16 (232 psi)	235	$9\frac{1}{4}$	354	$13\frac{15}{16}$	50	$1\frac{15}{16}$	OPTIONAL ¼" BSP/ NPT BLEED PORT FOR TEST COCK	23	50.7
80	3	080 RBX 2501 & 2531	PN25 (363 psi)	235	$9\frac{1}{4}$	354	$13\frac{15}{16}$	50	$1\frac{15}{16}$		23	50.7
80	3	080 RBX 4001 & 4031	PN40 (580 psi)	235	$9\frac{1}{4}$	369	$14\frac{1}{4}$	50	$1\frac{15}{16}$		24.5	54
100	4	100 RBX 1601 & 1631	PN16 (232 psi)	235	$9\frac{1}{4}$	369	$14\frac{1}{4}$	50	$1\frac{15}{16}$		22.5	49.6
100	4	100 RBX 2501 & 2531	PN25 (363 psi)	235	$9\frac{1}{4}$	374	$14\frac{3}{4}$	60	$2\frac{3}{8}$		22.5	49.6
100	4	100 RBX 4001 & 4031	PN40 (580 psi)	235	$9\frac{1}{4}$	407	16	60	$2\frac{3}{8}$		24	52.9

GENERAL SPECIFICATIONS

FLANGED - DN150(6") & DN200(8")



Type:
Double Orifice (Small & Large Orifice) with Anti-Shock Orifice Mechanism.

End Connection:
Flange for Alignment to;
BS 4504 PN10, PN16, PN25 & PN40
SABS 1123 - Tables 1000/3, 1600/3, 2500/3 & 4000/3
ANSI B16.5 Class 150 & 300

Nominal Sizes:
DN150 (6") & DN200 (8")

Model No's:	**Pressure Ratings bar (psi):**
RBX 1601 & 1631	PN 16 (232 psi)
RBX 2501 & 2531	PN 25 (363 psi)
RBX 4001 & 4031	PN 40 (580 psi)

Operating Pressure Range - bar (psi):

	Min.	**Max.**
PN16 (232 psi)	0.5 (7.25)	16 (232)
PN25 (363 psi)	0.5 (7.25)	25 (363)
PN40 (580 psi)	0.5 (7.25)	40 (580)

Operating Temperature Range:
4°C (40°F) to 80°C (176°F)

Acceptable Media:
Potable or strained raw water.

Function:
i) High volume air discharge - pipeline filling.
ii) High volume air intake - pipeline draining
iii) Pressurized air discharge - pipeline filled.
iv) Surge dampening - high velocity air discharge, water column separation & liquid oscillation.

Materials of Construction: - see page 6

Installation: - see page 3

Standard Factory Tests:
i) Hydrostatic - 1.5 x max. rated working pressure
ii) Low head leak - 0.5 bar (7.25 psi)
iii) Small orifice function at max. rated working pressure (minimum 1 valve in 10).

OVERALL DIMENSIONS & WEIGHTS

DN		MODEL No.	PRESSURE RATING	A		B		C		D		E		F		WEIGHT	
mm	in			mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	kg.	lbs
150	6	150 RBX1601 & 1631	PN16 (232 psi)	355	$13^{15}/_{16}$	457	18	133	$5^{1}/_{4}$	22	$^{7}/_{8}$	285	$11^{1}/_{5}$	612	24	69	152
150	6	150 RBX 2501 & 2531	PN25 (363 psi)	355	$13^{15}/_{16}$	457	18	127	5	28	$1^{1}/_{10}$	300	$11^{8}/_{10}$	612	24	69	152
150	6	150 RBX 4001 & 4031	PN40 (580 psi)	355	$13^{15}/_{16}$	457	18	127	5	28	$1^{1}/_{10}$	300	$11^{8}/_{10}$	612	24	75	165.3
200	8	200 RBX 1601 & 1631	PN16 (232 psi)	405	$15^{15}/_{16}$	497	$19^{9}/_{16}$	151	$5^{15}/_{16}$	24	1	340	$13^{3}/_{8}$	672	$26^{7}/_{16}$	97	213.8
200	8	200 RBX 2501 & 2531	PN25 (363 psi)	405	$15^{15}/_{16}$	497	$19^{9}/_{16}$	145	$5^{7}/_{10}$	30	$1^{3}/_{16}$	360	$14^{1}/_{6}$	672	$26^{7}/_{16}$	97	213.8
200	8	200 RBX 4001 & 4031	PN40 (580 psi)	405	$15^{15}/_{16}$	497	$19^{9}/_{16}$	141	$5^{9}/_{16}$	34	$1^{1}/_{3}$	370	$14^{8}/_{16}$	672	$26^{7}/_{16}$	108	238

MAINTENANCE

The Vent-O-Mat Series RBX valve is virtually maintenance free. There may however, on rare occasions, be the need to carry out maintenance on the valve. Enclosed is a guide providing possible reasons for maintenance requirements.

Problem	Reason	Course of Action
Valve Leaking through large orifice	Construction debris stuck in valve due to commisioning of new pipeline.	Follow enclosed Maintenance Instructions.
Valve Leaking around barrel seals.	Surge & Water Hammer problems in pipeline/ Severe undersizing of air valves	Notify manufacturer & Consulting Engineer/ Follow enclosed Maintenance Instructions.
Valve leaking through the large orifice despite no debris entrapped in valve.	Valve above the hydraulic gradeline.	Reposition valve 5 metres below hydraulic gradeline.
Small volumes of water evident on top flange during initial filling.	Normal operation of valve.	No course of action required .

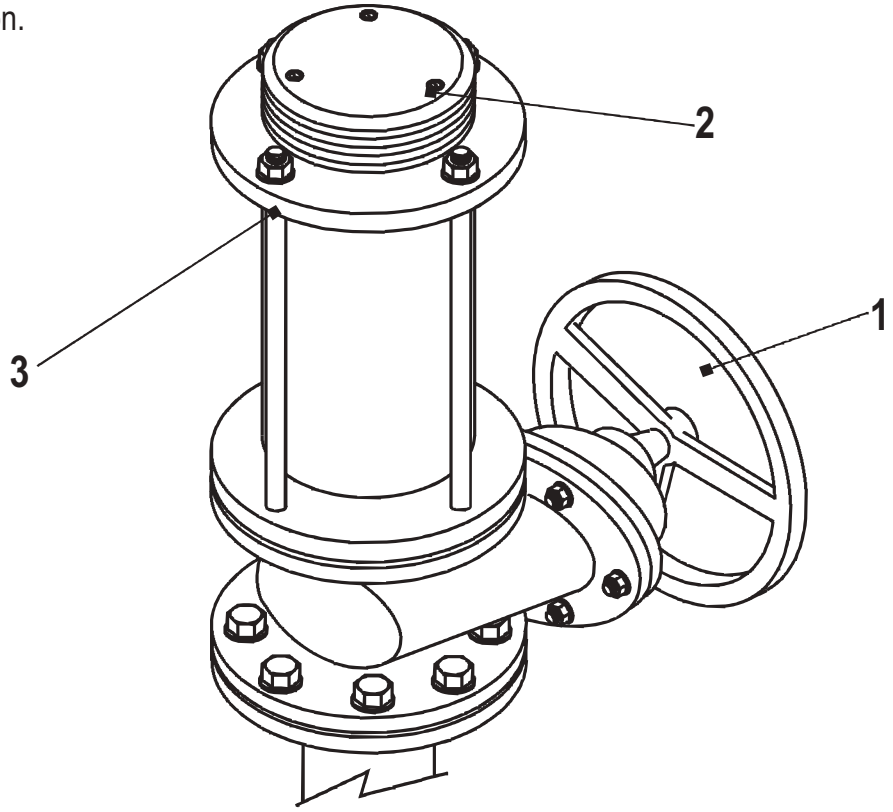
The RBX design facilitates ease of service and maintenance and all maintenance spares are replaceable without special tools or skills. A complete list of tools and spares required, as well as the maintenance procedures are enclosed below.

Tool & Spare Requirements

Valve Size	Tools Required	Spares Required
DN25	M8 Spanner & Flat Screwdriver	2 x Barrel Seals, 1 x Small Orifice Nozzle, 1 x O-Ring Seal, 2 x O-Ring Seats, 1 x Nozzle Seat
DN50	M8 & M12 Spanner & Flat Screwdriver	2 x Barrel Seals, 1 x Small Orifice Nozzle, 1 x O-Ring Seal, 2 x O-Ring Seats, 1 x Nozzle Seat

Maintenance Procedures

Step 1
Close the Isolator Valve (1). Remove Top Cover (2) utilising a flat screwdriver. Loosen Nuts (3) in a circular fashion.



Step 2
Remove the Top Flange Assembly (4) and inspect the O-Ring Seal (5) for damage. Remove the Barrel Assembly (6).

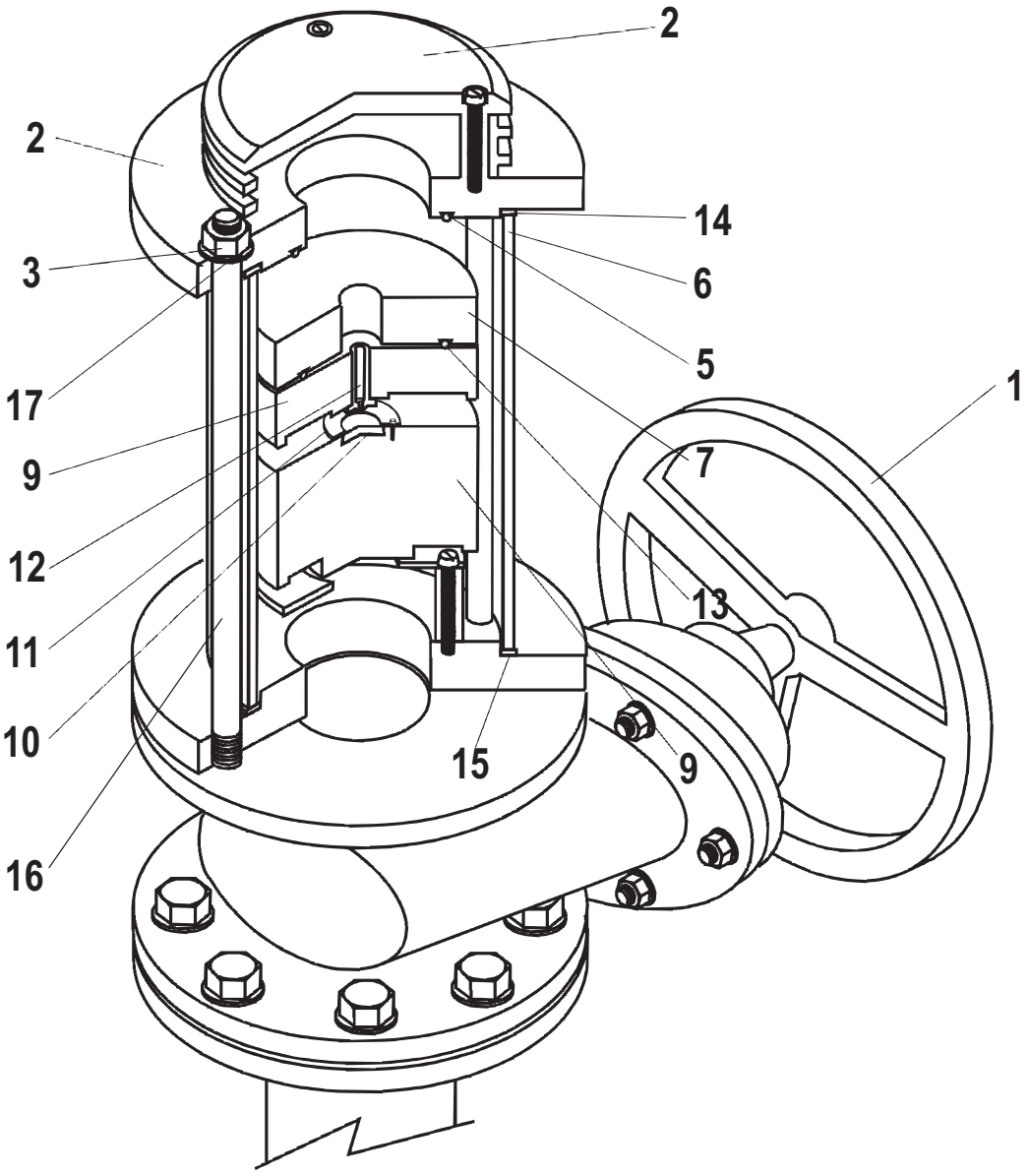
Step 3
Remove all Floats (7,8 & 9) and check for any entrapped debris. Rinse Floats in clear water.

Step 4
Replace Lower Float (9) with Nozzle Seat (10) facing upwards as indicated. Inspect the Nozzle Seat (10) for damage. Use a flat screwdriver to remove the Seat Retainer Plate (11), should the Seat Retainer Plate (11) need replacing (for DN80, 100, 150 and 200 only).

Step 5
Inspect the Small Orifice Nozzle (12) for any blockages or damage. Use a M8 spanner to remove the Small Orifice Nozzle (12) if necessary. Replace Upper Float (8) in the manner indicated. Ensure that the Small Orifice Nozzle (12) makes contact with the Nozzle Seat (10).

Step 6
Inspect the O-Ring Seat (13) for damage. Replace the "Anti-Shock" Float (7) in the manner indicated. Ensure that the O-Ring Seat (13) is facing down.

Step 7
Inspect Upper and Lower Barrel Seals (14 & 15) for damage.
Step 8
Replace the Barrel Assembly (6) ensuring that the Lower Barrel Seal (15) is in place.
Step 9
Replace the Top Flange Assembly (4), ensuring that the Upper Barrel Seal (14) is in place.
Step 10
Replace the Nuts (3) and Washers (17) ensuring that each Tie Road (16) has a Washer (17) and that the Upper Barrel Seal (14) is correctly positioned. First hand tighten Nuts (3), then "cross" tighten. Replace Top Cover (2). Reopen Isolator (1).



SHIPPING & STORAGE

Shipping
Vent-O-Mat valves are generally shipped by the factory or it's agents in well constructed wooden crates or cases, with the content, destination and factory (or agent's) details clearly marked by a label on at least two sides of the crate or case. Valves are carefully packed to ensure that no damage occurs during transit.

Storage
It is recommended that the valves be stored in a cool area if not to be used immediately.

VENT-O-MAT®

EXPLANATION OF MODEL NUMBERS

Vent-O-Mat model numbers are a series of numbers providing information on valve size, valve type, valve pressure rating and valve end connection.

050 RB X 25 0 1

VALVE SIZE:
DN25 (1") - 025
DN50 (2") - 050
DN80 (3") - 080
DN100 (4") - 100
DN150 (6") - 150
DN200 (8") - 200

VALVE SERIES No.

ANTI SHOCK ORIFICE:

VALVE PRESSURE RATING:
PN16 (232 psi) 16
PN25 (363 psi) 25
PN40 (580 psi) 40

VALVE TYPE:
DOUBLE ACTING 1

VALVE END CONNECTION:
SCREWED - BSP 1
SCREWED - NPT 2
FLANGED - BS 4504 OR SABS 1123 0
FLANGED - ANSI B16. 5 3

050 RB X v 25 0 1

VALVE SIZE:
DN25 (1") - 025
DN50 (2") - 050
DN80 (3") - 080
DN100 (4") - 100
DN150 (6") - 150
DN200 (8") - 200

VALVE SERIES No.

ANTI SHOCK ORIFICE:

SPECIAL APPLICATION:
BIAS AIR IN b
BIAS AIR OUT v
Nylon valve p

vacuum break bv

VALVE PRESSURE RATING:
PN16 (232 PSI), ANSI #125 16
PN25 (363 PSI), ANSI#250 25
PN40 (580 PSI), ANSI#300 40

VALVE TYPE:
DOUBLE ACTING 1

VALVE END CONNECTION:
SCREWED - BSP 1
SCREWED - NPT 2
FLANGED - BS 4504 OR SABS 1123 0
FLANGED - ANSI B16. 1 OR B16. 5 3

Series RBX
OPERATION

PRE NOTES:

1. VENTING OF A FILLING PIPELINE:

The operation of a conventional air release valve is such that fast approaching water is almost instantaneously halted by the valve's closure without the shock cushioning benefit of any retained air in the pipeline. Consequently a transient pressure rise or shock of potentially damaging proportions can be generated in a pipeline system, even at normal filling rates.

In addition to venting through the Large Orifice (1) when water approach velocities are sub critical, the Vent-O-Mat series RBX air release valves feature an automatic "Anti-Shock" Orifice (8) device that serves to decelerate water approaching at excessive speed, thereby limiting pressure rise to a maximum of 1.5 x rated working pressure of the valve.

2. SURGE ALLEVIATION - PIPELINE PRESSURIZED:

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

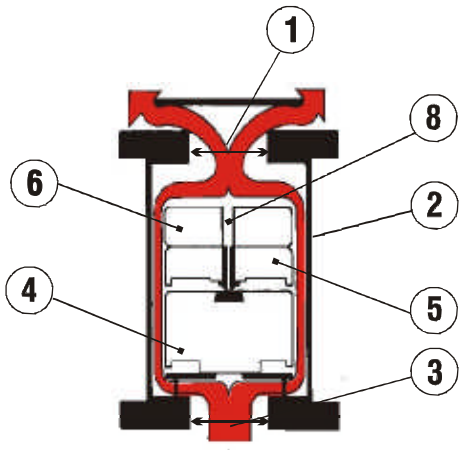
The Vent-O-Mat series RBX takes in air through the unobstructed large orifice when water column separation occurs, but controls the discharge of air through the "Anti-Shock" Orifice as the separated column commences to rejoin. The rejoining impact velocity is thereby sufficiently reduced to prevent an unacceptably high surge pressure in the system. In the same way the series RBX valve prevents high surge pressures resulting from liquid oscillation in a pipeline.

3. PRESSURIZED AIR RELEASE FROM A FULL PIPELINE:

Effective discharge by the valve of pressurized air depends on the existence of a 'CRITICAL RELATIONSHIP' between the area of the Small Orifice (7) and the mass of Control Float (4), i.e., the mass of the float must be greater than the force created by the working pressure acting on the orifice area. If the float is relatively too light or the orifice area relatively too great, the float will be held against the orifice, even when not buoyed, and air discharge will not be effected.

To ensure that the correct 'CRITICAL RELATIONSHIP' exists the requisite 'DROP TEST' described under TEST SPECIFICATION on page 17 must be applied to any air release valve which is intended for discharge of pressurized air.

VENTING OF A FILLING PIPELINE (SUB CRITICAL WATER APPROACH VELOCITY)

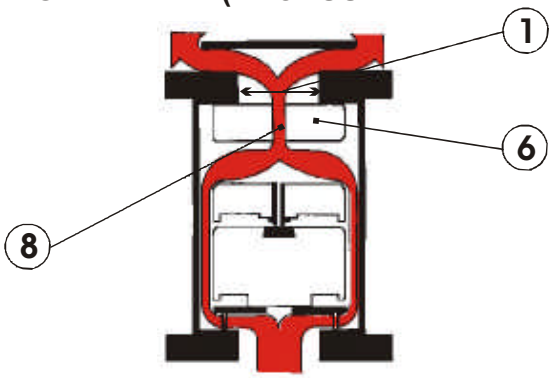


Air enters Orifice (3), travels through the annular space between the cylindrical floats (4), (5), and (6) and the valve Chamber Barrel (2) and discharges from the Large Orifice (1) into atmosphere.

Series RBX

OPERATION

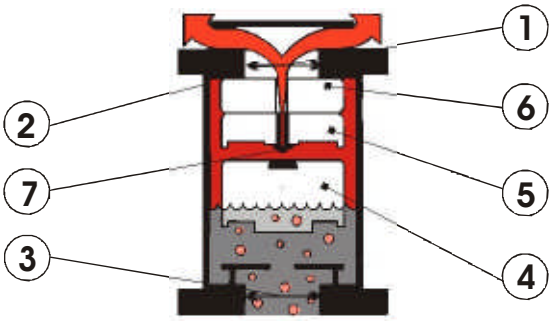
VENTING OF A FILLING PIPELINE (EXCESSIVE WATER APPROACH VELOCITY)



In reaction to increased air flow, Float (6) closes Large Orifice (1) and air is forced through the "Anti-Shock" Orifice (8) resulting in deceleration of the approaching water due to the resistance of rising air pressure in the valve.

Attention is drawn to Pre Note 1 and 2 on page 1.

PRESSURIZED AIR RELEASE FROM A FULL PIPELINE

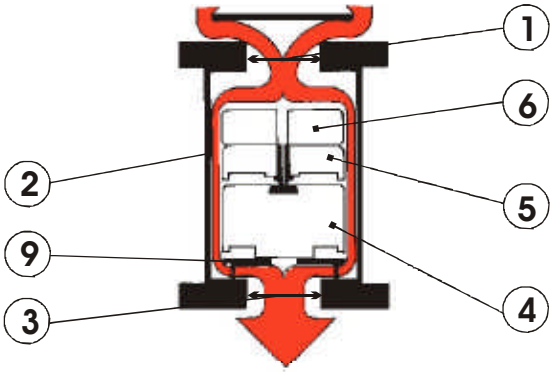


Subsequent to the filling of a pipeline, liquid enters the valve Barrel Chamber (2) and the Floats (4), (5) and (6) are buoyed so that the Large Orifice (1) is closed by Float (6), the valve will then become internally pressurized. A minimal working pressure of < 0. 5 bar (7. 3 psi) acting on the relatively large area of the Orifice (1) will lock Float (6) into the closed position across the Large Orifice (1).

Disentrained air rises through the liquid and accumulates in the valve chamber, when the volume of air is sufficient to displace the liquid, Float (4) will no longer be buoyant and will gravitate downwards thereby opening the Small Orifice (7) and allowing accumulated air to be discharged into atmosphere, as air is discharged the liquid raises Float (4) and re - seals the Small Orifice (7) and prevents escape of liquid

Specific attention is drawn to pre note 3 on page 1.

VACUUM RELIEF (AIR INTAKE) OF A DRAINING PIPELINE



Simultaneous drainage of liquid from Valve Chamber (2) causes Floats (4), (5) and (6) to gravitate downwards onto the Baffle Plate (9), thereby allowing atmospheric air through the valve to rapidly displace draining liquid in the pipeline and prevent potentially damaging internal negative pressure.

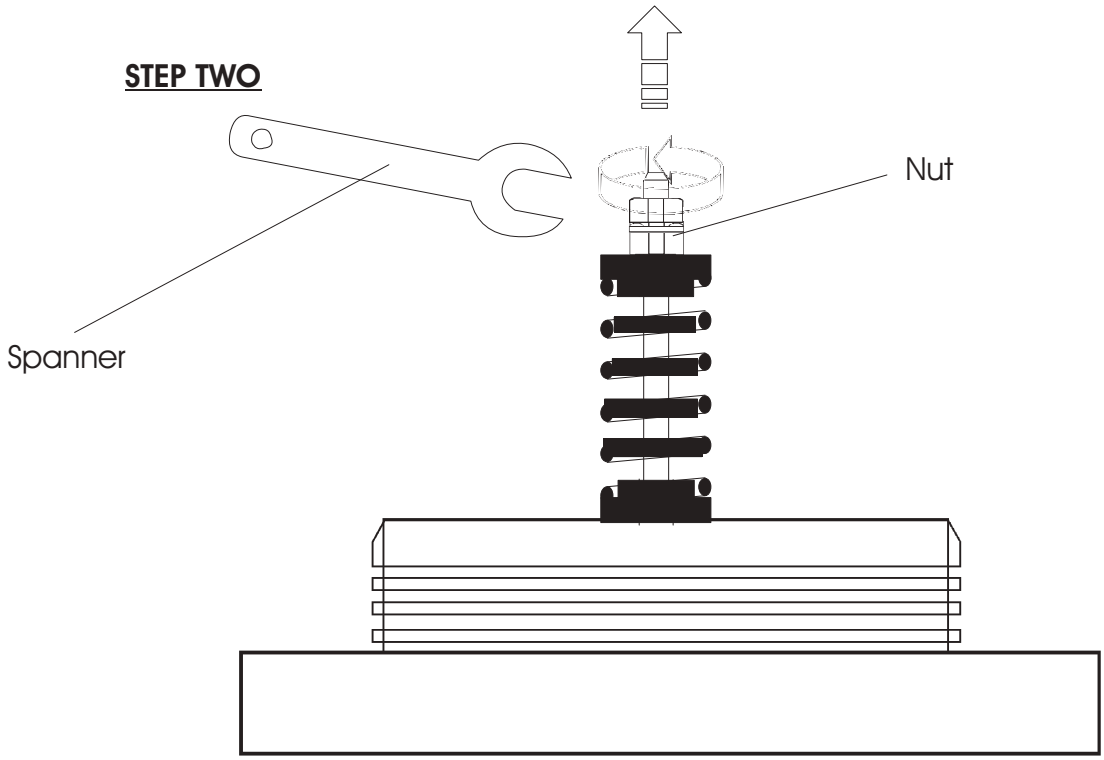
Instructions for the Replacement and adjustment of a bias mechanism Spring For purposes of maintenance

As a rule the Bias Mechanism device should need little to no maintenance
As per general instructions where we suggest that the valve be subjected to a visual inspection every 6 months that the nuts on the bias mechanism be checked that they are keeping the Bias spring tensed but not compressed. Should modifications be required follow instructions below:

STEP ONE

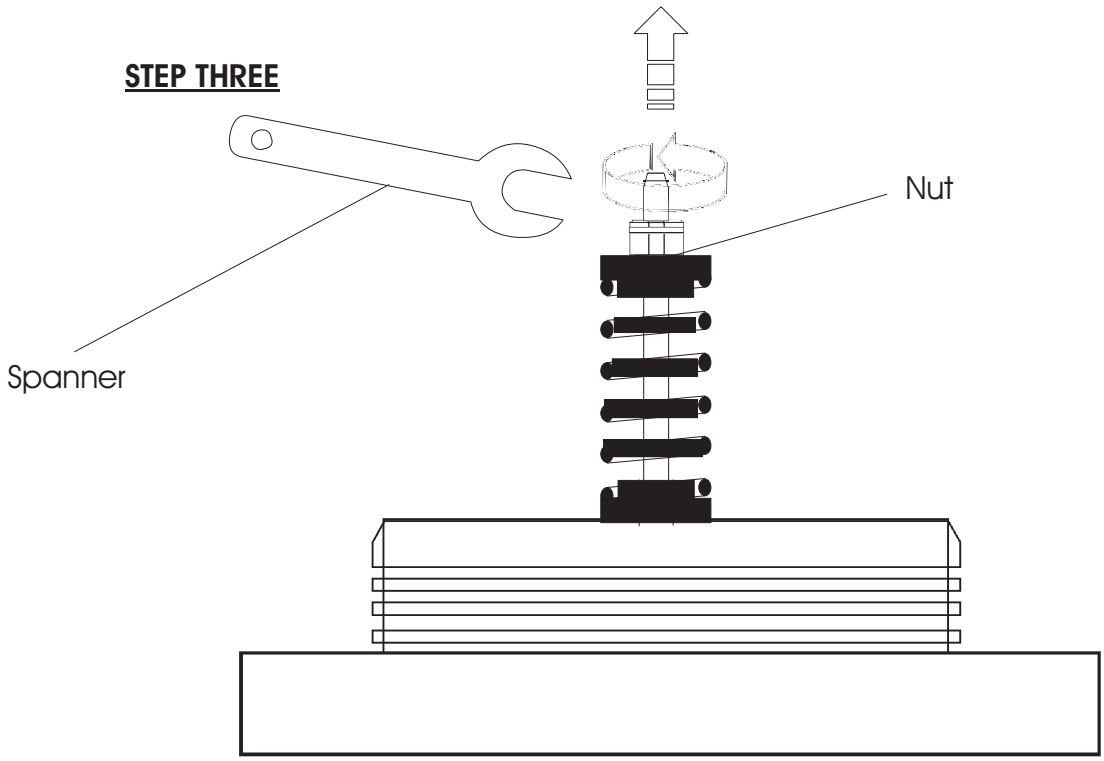
Isolate air valve and make sure that all pressure has been bled off from the valve before completely loosening top flange remove top flange.

STEP TWO

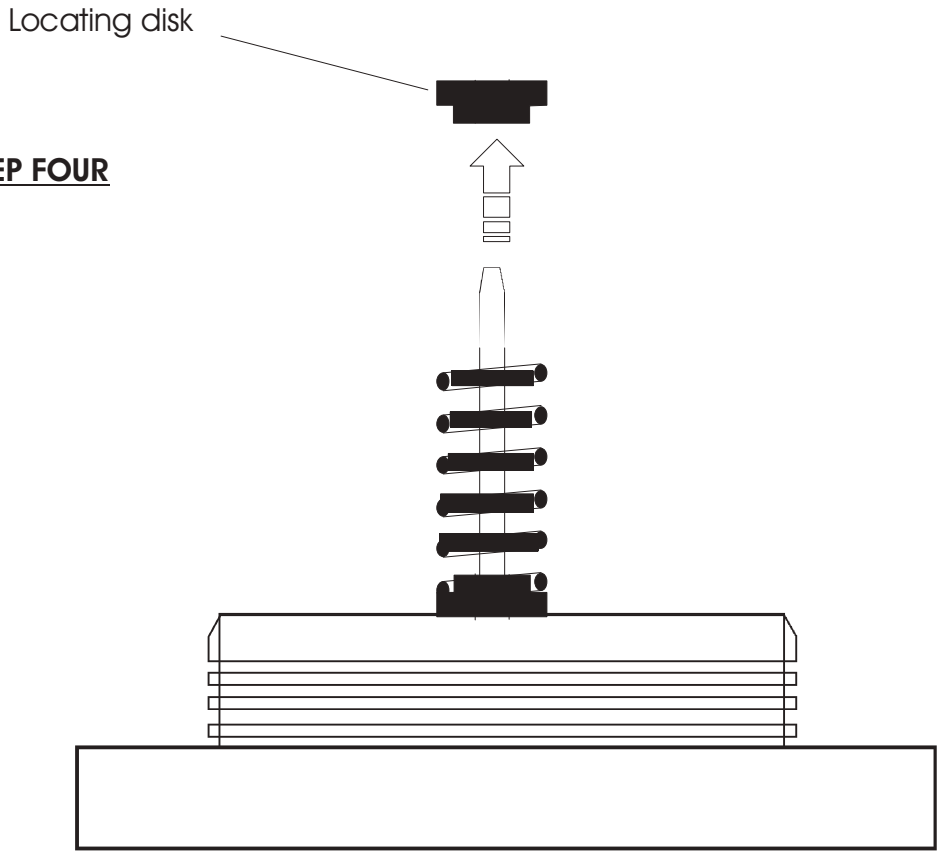


Loosen and remove top nut

STEP THREE

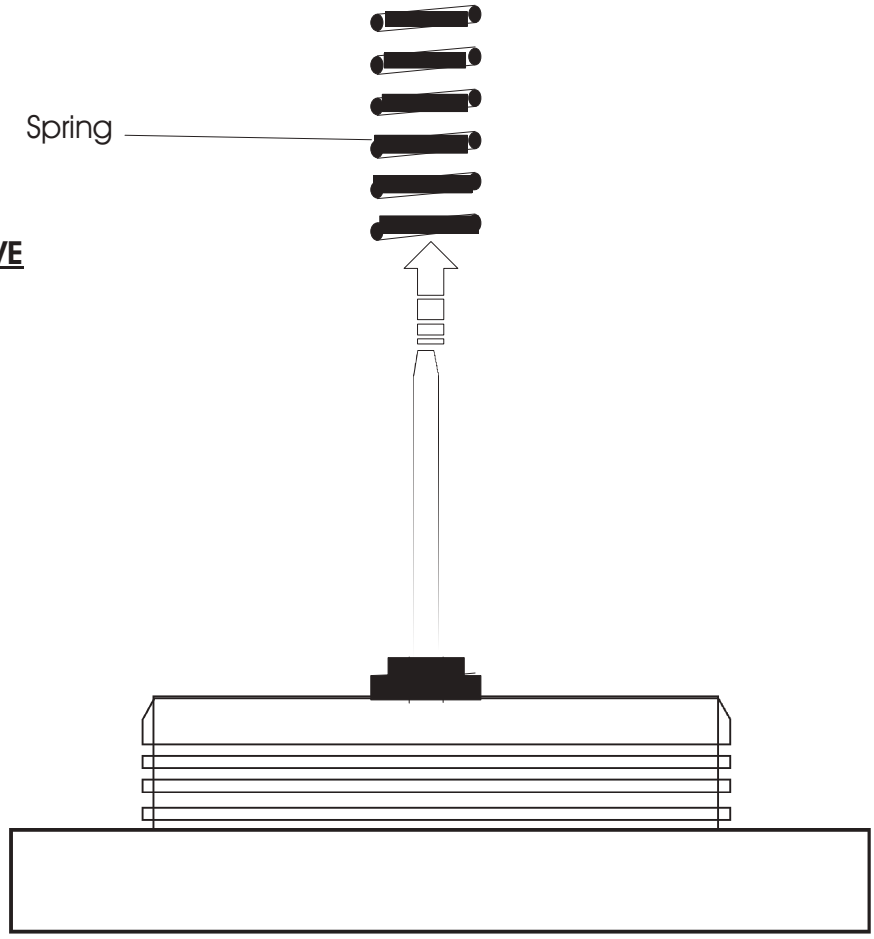


Loosen and remove Lower nut



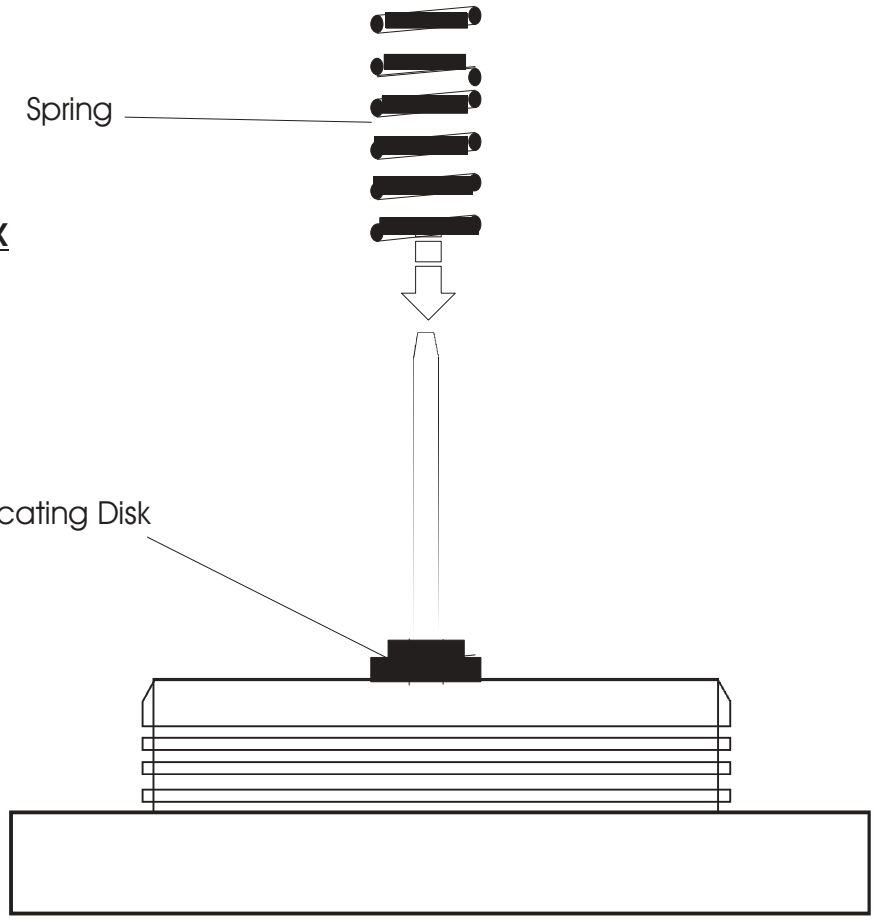
STEP FOUR

Remove Locating disk



STEP FIVE

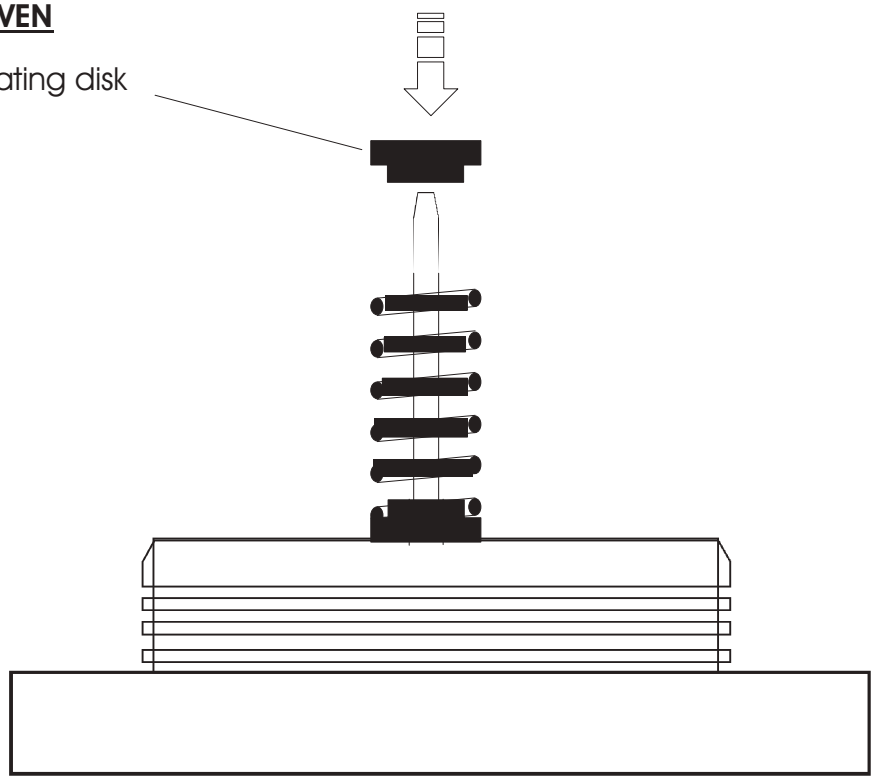
Remove Spring check integrity of lower locating disk. At this time should any replacement items be needed they should be ready now and incorperated into the reconstruction



STEP SIX

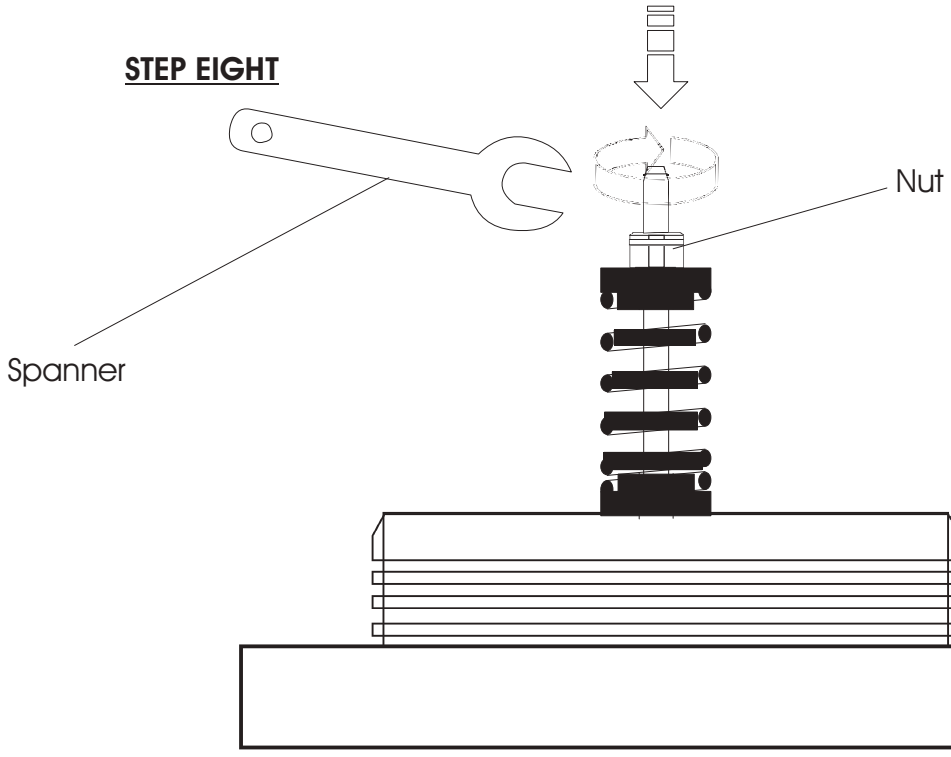
Replace the Spring on the bias mechanism rod, making sure it fits securely into the lower locating disk.

STEP SEVEN



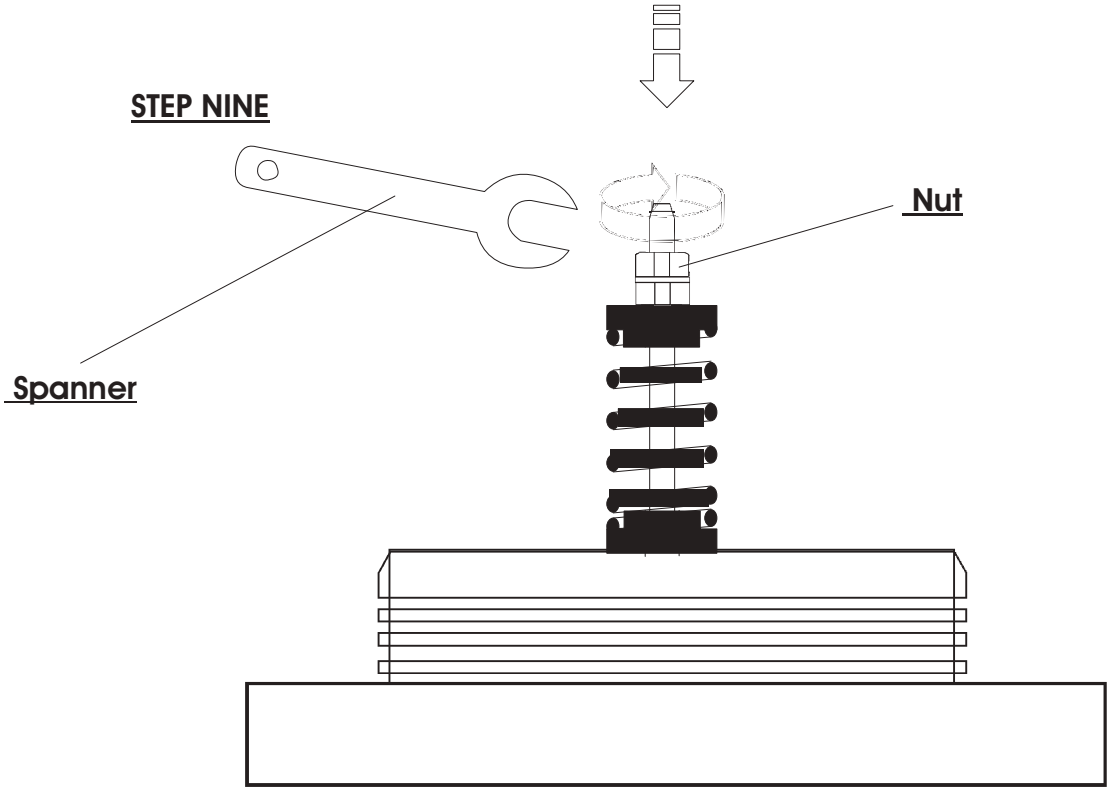
Replace the upper locating disk

STEP EIGHT



Replace and tighten lower nut tensing the spring but not compressing it.

STEP NINE



Replace and tighten upper nut so that it sits securely and tightly against the lower nut.(This step is very important)

STEP TEN

Replace top flange making sure to cross tighten bolts when tightening. Open the isolator slowly and ensure that the valve does not leak.

VENT-O-MAT®

SERIES RBX

AIR RELEASE & VACUUM BREAK VALVES

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