

**VENT-O-MAT<sup>®</sup>**

## **SERIES RBX<sub>p</sub>**

**“ANTI-SHOCK” AIR RELEASE AND VACUUM BREAK VALVES  
FOR EFFECTIVE AIR RELEASE VACUUM PROTECTION AND  
SURGE ALLEVIATION**





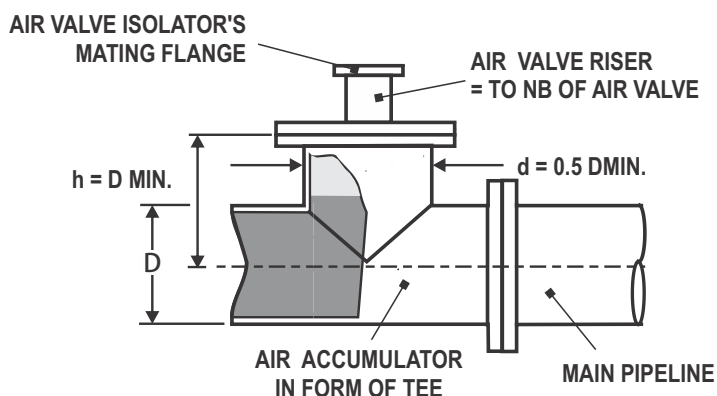
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## RECOMMENDED INSTALLATION ARRANGEMENTS

### 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.

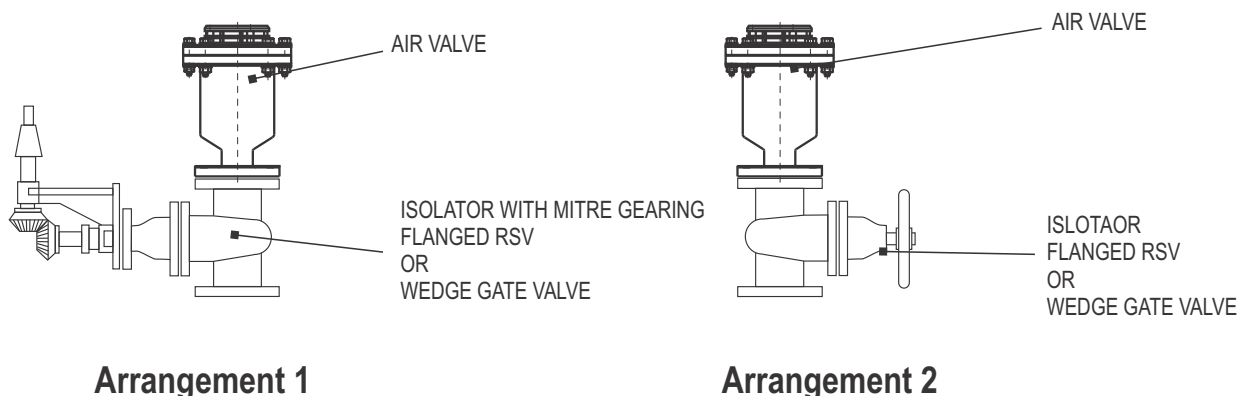


### Isolator Arrangements

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.

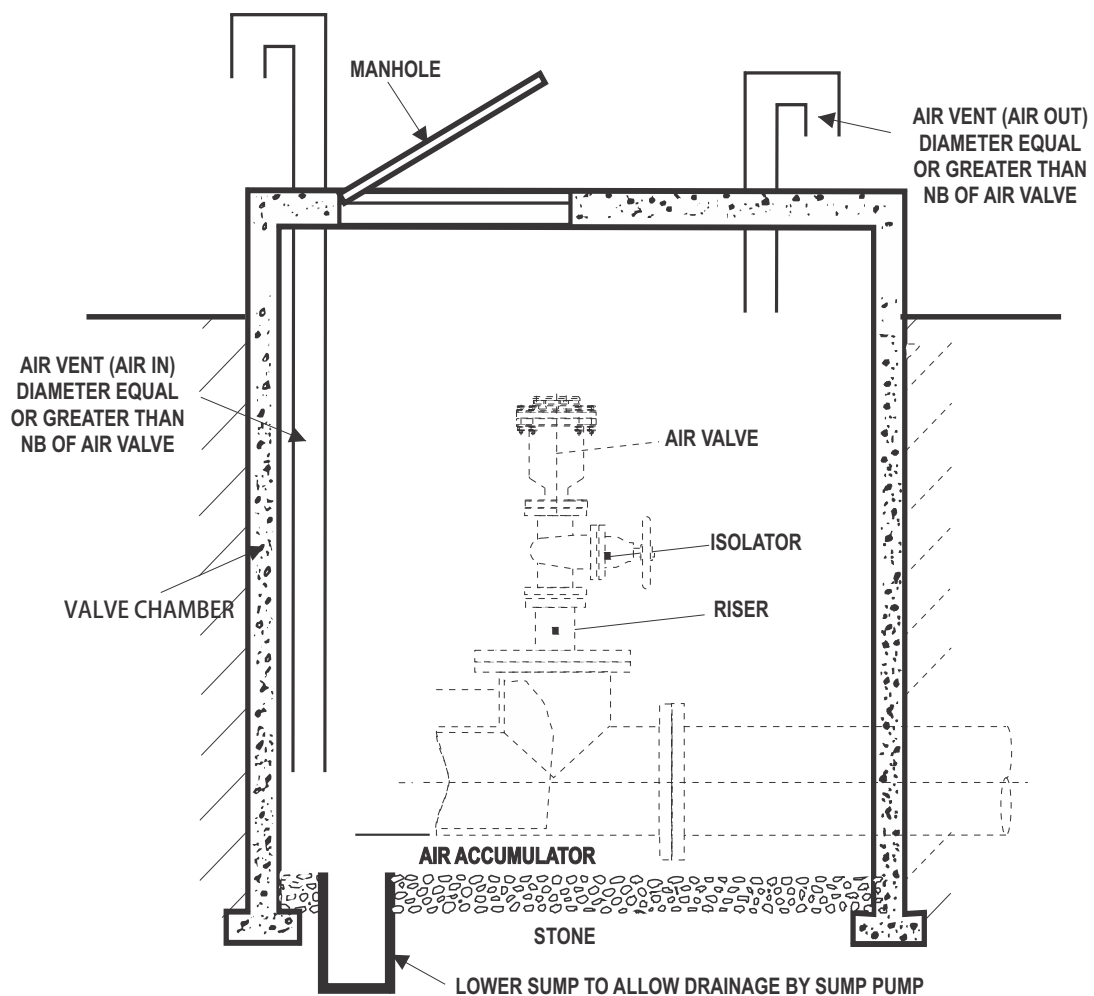
### Arrangement 1 and 2

Recommended for valves installed inside a valve chamber, to be operated by an Isolator Gate Valve



## 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.



**AIR VALVE CHAMBER**

# VENT-O-MAT®

**Type:**

Series RBXc - Double Orifice (Small & Large Orifice)  
with Anti Shock Orifice Mechanism

**End Connection:**

Flanged

**Nominal Sizes:**

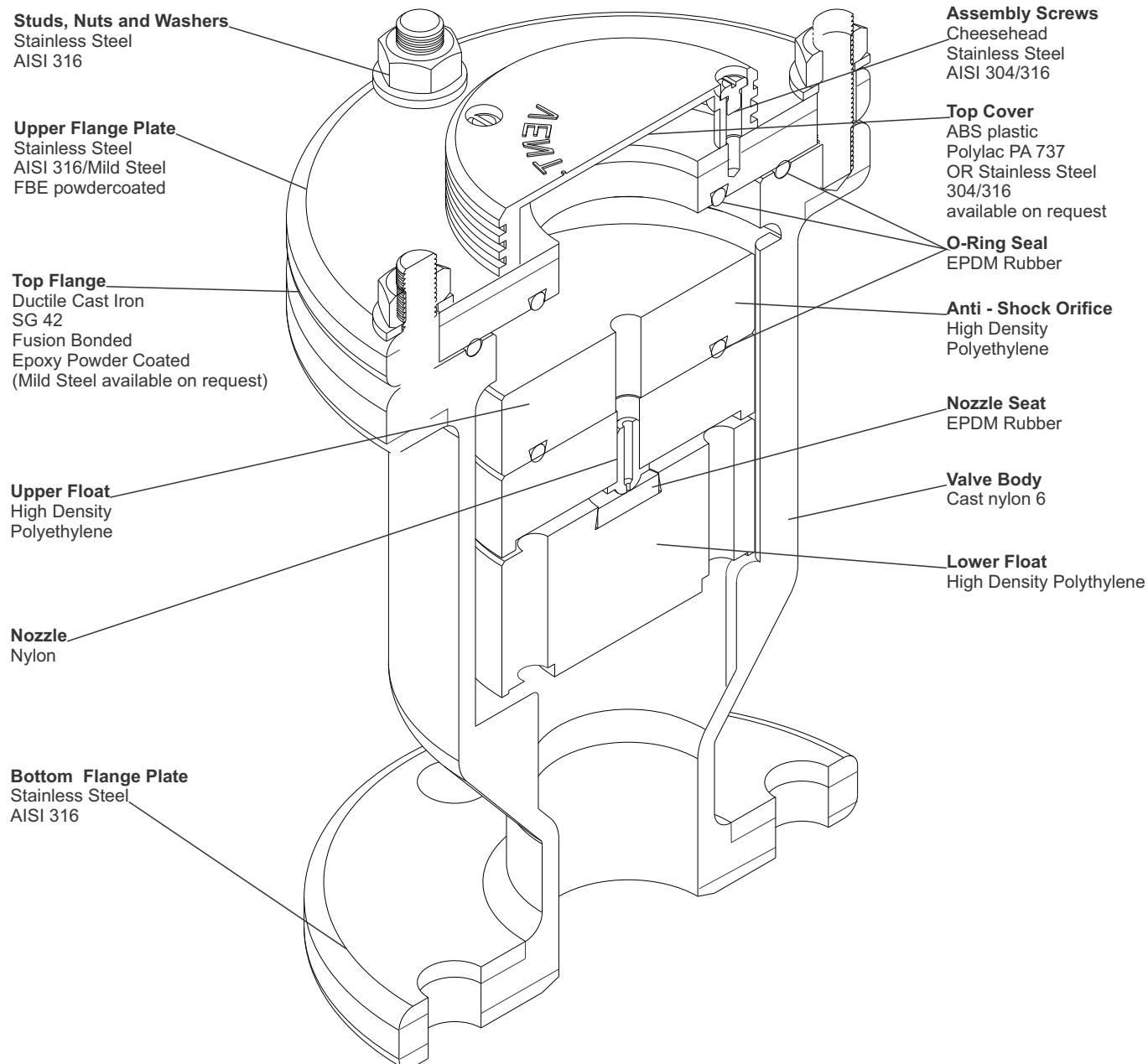
DN50 (2")  
DN80 (3")  
Dn100 (4")

**Model No's:**

RBXc 1601 & 1631

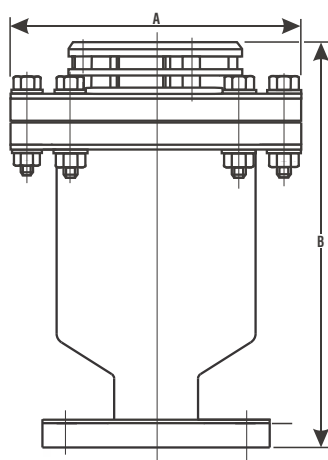
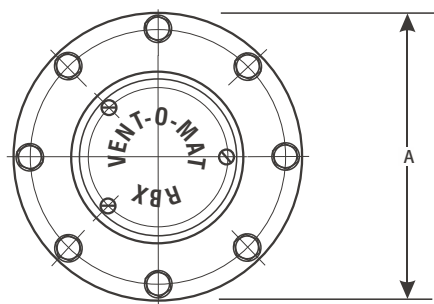
**Pressure Ratings:**

PN16 (232 psi)  
BS EN1092/BS 4504/SABS 1123  
ANSI #150



## GENERAL SPECIFICATIONS

### FLANGED DN50-DN100

**Type:**

Double Orifice (Small & Large Orifice) with Anti Shock Orifice mechanism.

**End Connection:**

Flange for Alignment to;  
SABS 1123 - Tables 1600/3

**Nominal Sizes:**

DN50 (3") & DN100 (6")

**Model No's: Pressure Ratings bar (psi):**

	Min	Max.
16 bar (232 psi)	0.5 (7.2)	16 (232)

**Operating Temperature Range:**

0 C (35 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.

**Standard Factory Tests:**

- i) Hydrostatic - 1.5 x max. rated working pressure
- ii) Low head leak - 0.5 bar (7.2 psi)
- iii) Small orifice function at max. rated working pressure (minimum 1 valve in 10).

## OVERALL DIMENSIONS & WEIGHTS

DN mm	in.	MODEL No.	A		B		WEIGHT	
			mm	in.	mm	in.	kg.	lbs
050	2"	050RBXp1631	190	7.48	341	13.43	7	15
080	3"	080RBXp1631	260	10.24	401	15.79	14	31
100	4"	100RBXp1631	260	10.24	401	15.79	30	31

# Series RBXp

## OPERATION

### PRE NOTES:

#### 1. VENTING OF A FILLING PIPELINE:

The operation of a kinetic 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 RBXp 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.

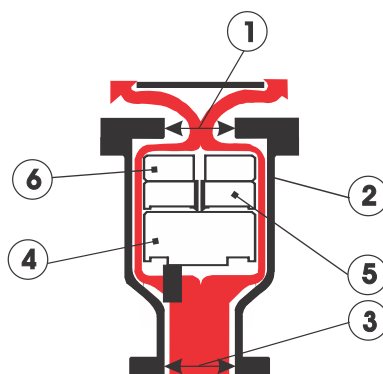
The Vent-O-Mat series RBXp takes in air through the unobstructed large orifice when water column separation occurs, but controls the discharge of air through the 'Anti-Shock' Orifice as the separated column commences to rejoin. The rejoining impact velocity is thereby sufficiently reduced to prevent an unacceptably high surge pressure in the system. In the same way the series RBXp 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.

#### 4. OPERATION OF DN100:

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

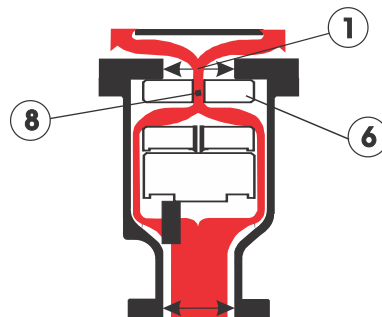


Air enters Orifice (3), travels through the annular space between the cylindrical floats (4), (5), and (6) and the valve Chamber Barrel (2) and discharges from the Large Orifice (1) into atmosphere.



## Series RBXp OPERATION

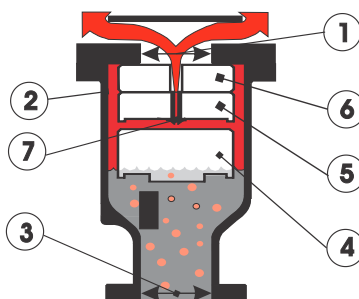
### VENTING OF A FILLING PIPELINE (EXCESSIVE WATER APPROACH VELOCITY)



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 8.

### PRESSURIZED AIR RELEASE FROM A FULL PIPELINE

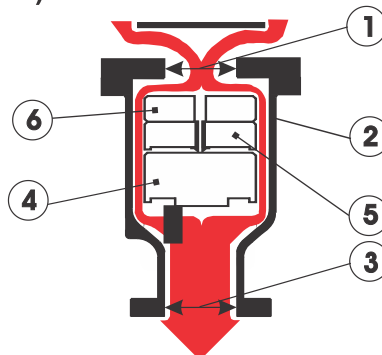


Subsequent to the filling of a pipeline, liquid enters the valve Barrel Chamber (2) and the Floats (4), (5) and (6) are buoyed so that the Large Orifice (1) is closed by Float (6), the valve will then become internally pressurized. A minimal working pressure of < 0.5 bar (7.3 psi) acting on the relatively 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 8.

### 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, thereby allowing atmospheric air through the valve to rapidly displace draining liquid in the pipeline and prevent potentially damaging internal negative pressure.



## CONDITIONS OF SALE

Sale of VENT -O- MAT equipment is subject to the purchaser's acceptance of the company's STANDARD CONDITIONS OF TENDER AND SALE a copy of which is available on request.

### CONTRACTUAL LIMITATIONS:

The 'Company's' supply is limited to such equipment, accessories, work and documentation as is specified in its quotations.

### DRAWINGS AND DATA:

All drawings, illustrations, descriptive literature, technical data or particulars of mass and dimensions accompanying the 'Company's' quotations must be considered approximate except when specifically certified.

### TESTS:

The goods will be tested in accordance with the specifications of the 'Company's' tender and/or relevant standard specifications as stated therein.

- (a) Offers for equipment available ex-stock are subject to such stock remaining unsold at time of order placement.
- (b) Delivery periods quoted are based on the manufacturing position at the time of quotation. Whilst every endeavour will be made to maintain such deliveries, no liability shall be accepted by the 'Company' due to causes beyond its control.
- (c) The 'Company' shall only accept liability for late delivery where the 'Company's' liability for such late delivery is not excluded in terms of foregoing and where the 'Company' has specifically agreed in writing to the payment of a penalty or liquidated damages or damages for such late delivery. In which case the 'Company's' liability shall be limited to the amount so agreed.

### DELIVERY:

The 'Company's' will deliver, where provided for, to a destination named in its quotation at which point the 'Company's' responsibility for the goods will cease.

### PACKING:

Where the 'Company' deems goods vulnerable to damage during transit, the 'Company' reserves the right to pack such goods in suitable protective packaging or crates at the Purchaser's cost. Invoices for packaging will be substantiated by a copy of relevant documentation from the packaging contractor.

### PRICE BASIS:

Prices are referenced from the 'Company's' valid lists or from the 'Company's' written or verbal quotation exclude packaging and delivery.

### PAYMENT TERMS:

Without exception, payment for all goods and services shall be received by the 'Company' not later than 30 (THIRTY) days subsequent to the date of statement. Interest at prime lending rate +2% shall be charged on all overdue amounts.

### TITLE:

Ownership of all goods supplied by the 'Company' will not pass to the purchaser or any other party until paid for in full and until such time, the 'Company' shall be entitled to re-possess the goods whether affixed to immovable property or not. All such goods shall be deemed to be removable property and severable from immovable property.

### TENDER / QUOTATION VALIDITY:

Written or verbal quotations will be held for a maximum of 30 (THIRTY) days unless contradicted in writing by the 'Company'.

### RETURNS FOR CREDIT:

Will be entirely at the discretion of the 'Company' and subject to a minimum restocking charge equal to 15% of the gross invoiced value of such returned goods.

### LIMITED LIABILITY:

The 'Company' shall not be liable for any incidental or consequential loss or damages or expense arising directly or indirectly from the use of any goods supplied, nor shall liability be accepted for any labour or other expenses incurred. The 'Company's' liability is limited solely to the terms of its guarantee

## WARRANTY

- (a) The 'Company' guarantees that the goods supplied will conform to specifications and to any requirements specifically accepted by the 'Company' in writing in regard to each order but, except as aforesaid, the 'Company' gives no warranty, express or implied, of the material workmanship or fitness of goods for any particular purpose whether such purpose is known to us or not. In accordance with the specifications or requirements aforesaid, or should defects under proper use appear in the goods within a period of 12 (TWELVE) calendar months after the goods have been delivered, caused solely by faulty design, materials or workmanship, we shall, if requested to do so within a reasonable time, but not later than 18 (EIGHTEEN) calendar months, from date of delivery, repair such goods or the defective parts thereof, free of charge by supplying other goods or replacement parts at the initial place of delivery which do comply with specifications or requirements aforesaid and/or which are free of the defects complained of.
- (b) It is a condition of this guarantee:
  - (i) that any defective parts are returned to the 'Company's' works at the purchaser's expenses and;
  - (ii) in respect of parts or components not of the 'Company's' manufacture, the 'Company's' guarantee shall be limited to the guarantee, if any which we may have received from the supplier of such parts or components in respect thereof so that the 'Company's' liability in terms of such guarantee shall be no greater than the 'Company's' liability in terms of the 'Company's' own guarantee as set out in this clause;
  - (iii) the 'Company' shall be given reasonable time and opportunity to comply with the terms of the guarantee before you call on the 'Company' to pay any sums in respect of the liquidated damages and;
  - (iv) save as provided in the clause, the 'Company' shall be under no liability, whether in contract, delict or otherwise in respect of defects in goods delivered, or for any injury, damage or loss resulting from defect or from any work done in connection therewith.

**VENT-O-MAT®**

**100RBXp1601**

**AIR RELEASE AND VACUUM  
BREAK VALVES**

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**RBXp 0002**