

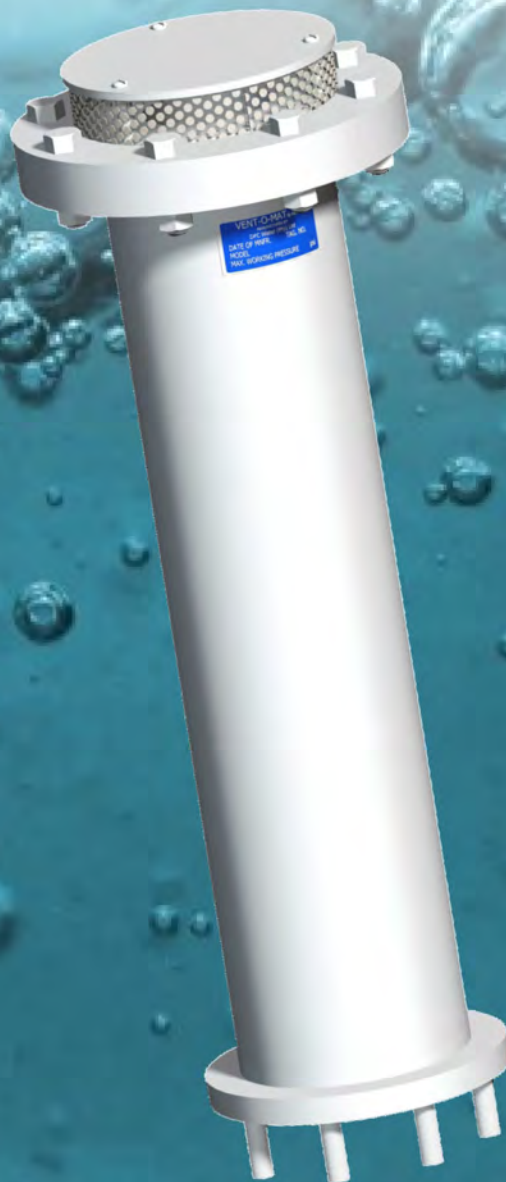
**VENT-O-MAT<sup>®</sup>**

# **SERIES RGX**

**“ANTI-SURGE”**

**SEWAGE AIR RELEASE AND VACUUM BREAK VALVES**

**FOR EFFECTIVE AIR RELEASE, VACUUM PROTECTION AND  
SURGE ALLEVIATION**





# SEWAGE AIR RELEASE & VACUUM BREAK VALVES

## SERIES RGX

### "ANTI - SURGE"

**The Unique defence against pipe bursts and pipeline system damage!**

Vent-O-Mat Series RGX has evolved from a long lineage of research and development into a product that has proven unsurpassed for air release, vacuum protection, surge alleviation and pipeline flow enhancement.

The basis of the Vent-O-Mat design is in the understanding of the physical laws that govern air valve and pipeline operation. Reaction to pipeline dynamics is therefore instantaneous and protection provided is relevant to the pipeline's needs.

Vent-O-Mat Series RGX truly represents the pinnacle of valve design evolution. This valve design provides the most comprehensive, effective and efficient pipeline protection relative to initial cost of any other available pipeline component. This can easily be gauged from the below:

#### **Automatic Surge Protection**

The unique Series RGX valve incorporates as standard, three design features to automatically protect a pipeline, under all pipeline operating conditions, from the destructive surge and water hammer phenomena. These features are independent of any mechanical devices ensuring reaction in a very low milli second time span.

#### **Effective Air Release**

The RGX design ensures effective de-aeration under all pipeline flow and operating conditions, via either one of three discharge orifices.

#### **Vacuum Protection**

The RGX series large orifice diameters equal the nominal size of the valve. This ensures the least possible resistance to the intake of air and consequently the least possible negative pressure within a draining pipeline. The use of solid, cylindrical floats ensures instantaneous reaction, discourages the "Venturi" phenomenon and is a further guarantee of effective vacuum protection.

#### **Guaranteed Performance**

The RGX has been designed and developed to provide the optimum usable and safe performance relative to all functions. Selection data has been substantiated through third party testing and can therefore be confidently referenced.

The surge protection function of the RGX design has been incorporated in the well-known **SURGE 2000** surge analysis software programme and can be analysed with great accuracy in other commercially available surge analysis programmes such as FLOWMASTER and TRANSAM.

#### **Unparalleled Service**

Vent-O-Mat is committed to customer service and to the selling of solutions. Our highly dedicated team is available at all times to assist with air valve sizing and positioning. Assistance is also provided in finding the most cost effective and/or efficient surge protection strategy relevant to the pipeline's needs.

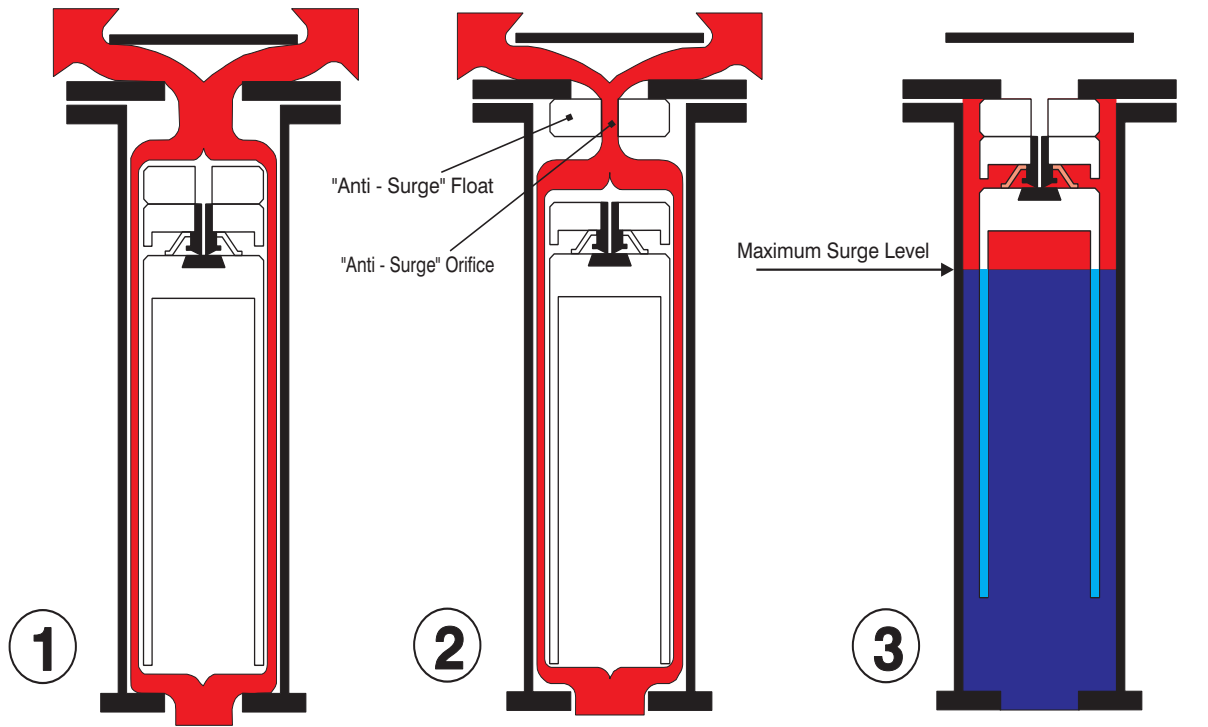
#### **International Representation**

Vent-O-Mat is represented in the following countries and regions:

- |                        |            |                |               |             |
|------------------------|------------|----------------|---------------|-------------|
| * USA                  | * Thailand | * South Africa | * Tanzania    | * Kuwait    |
| * Canada               | * Germany  | * Mexico       | * Hong Kong   | * Brazil    |
| * Caribbean            | * Peru     | * Chile        | * Taiwan      | * France    |
| * United Arab Emirates | * Egypt    | * Malawi       | * New Zealand | * Singapore |

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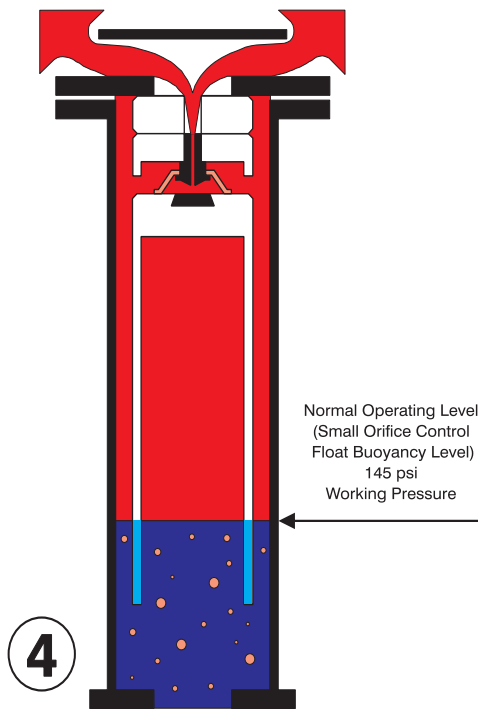
# Series RGX OPERATION



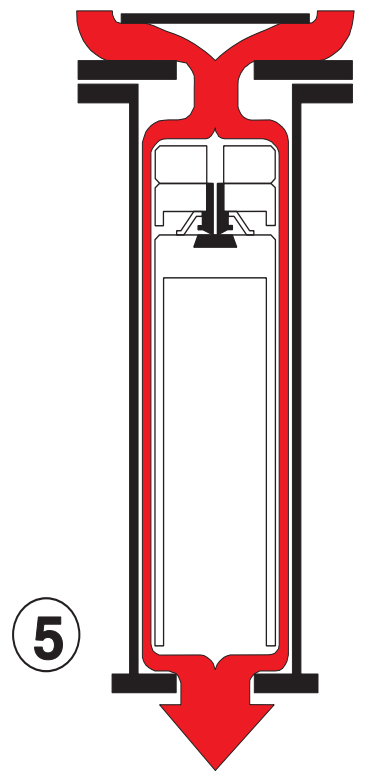
**PIPELINE FILLING  
(SUB CRITICAL SEWAGE / EFFLUENT  
APPROACH VELOCITY)**

**PIPELINE FILLING  
(EXCESSIVE SEWAGE / EFFLUENT  
APPROACH VELOCITY)**

**PIPELINE FULLY CHARGED**



**PRESSURIZED AIR / GAS RELEASE  
PIPELINE OPERATING**



**VACUUM RELIEF (AIR INTAKE)  
PIPELINE DRAINING**

# OPERATION

## PRE NOTES:

### A) VENTING OF A FILLING PIPELINE:

The operation of a conventional sewage air release valve is such that fast approaching sewage/effluent is almost instantaneously halted by the valve's closure. 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 when sewage/ effluent approach velocities are sub critical, the Vent -O- Mat series RGX sewage air release valves feature an automatic "Anti - Surge" Orifice device that serves to decelerate sewage/ effluent approaching at excessive speed, thereby limiting pressure rise in the pipeline.

### B) SURGE ALLEVIATION - PIPELINE PRESSURIZED:

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

The Vent -O- Mat series RGX takes in air through the unobstructed large orifice when column separation occurs, but controls the discharge of air/gas through the "Anti-Surge" 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 RGX valve prevents high surge pressures resulting from liquid oscillation in a pipeline.

---

## 1. PIPELINE FILLING (SUB CRITICAL SEWAGE/ EFFLUENT APPROACH VELOCITY)

Air/gas flows through the annular area around the control float assembly and to atmosphere through the large orifice.

## 2. PIPELINE FILLING (EXCESSIVE SEWAGE/ EFFLUENT APPROACH VELOCITY)

In reaction to an increase in air/gas flow, the "Anti - Surge" float closes the large orifice and air/gas is forced through the "Anti - Surge" Orifice resulting in a deceleration of the approaching liquid due to the resistance of rising air/gas pressure in the valve.

**Attention is drawn to Pre Notes (A) and (B) above.**

## 3. PIPELINE FULLY CHARGED

Sewage/effluent has entered the valve chamber and buoyed the floats to close both the large and the small orifice. The design's compression/ volume relationship prevents the media from ever exceeding the maximum surge level indicated in diagram 3. The resultant sewage/ effluent free area protects against the fouling of the orifice seals by solids or high viscous substances.

## 4. PRESSURIZED AIR/ GAS RELEASE - PIPELINE OPERATING

The volume of disentrained air/gas increases in the valve and displaces the sewage/effluent to the lower, normal operating level (small orifice control float buoyancy level). Any additional lowering of the sewage/effluent level, as would occur when more air/gas enters the valve, will result in the control float dropping away from the small orifice through which pressurized air/gas is then being discharged to atmosphere.

The control float will close the small orifice when sufficient air/gas has been released to restore the sewage effluent to the normal operating level.

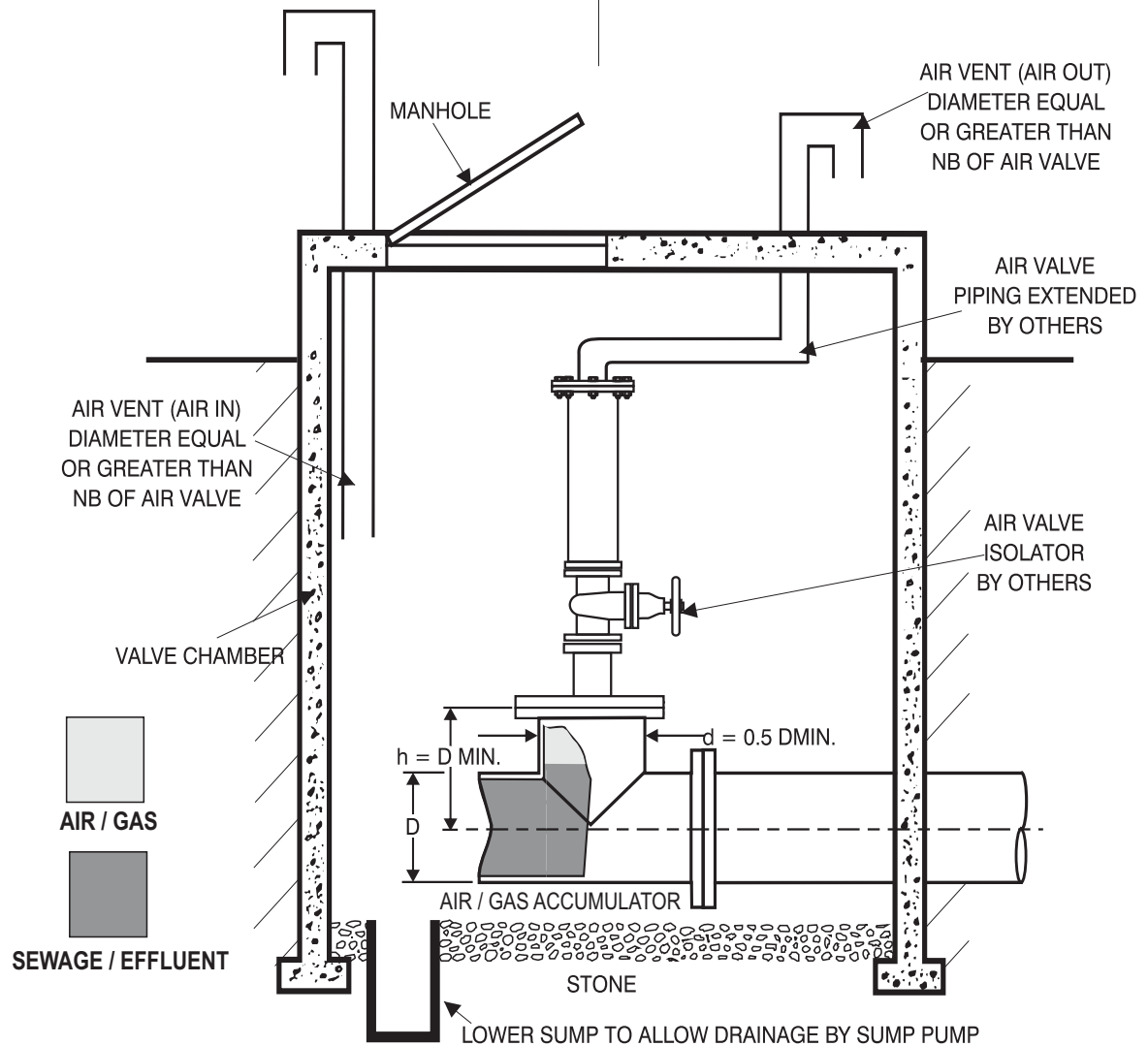
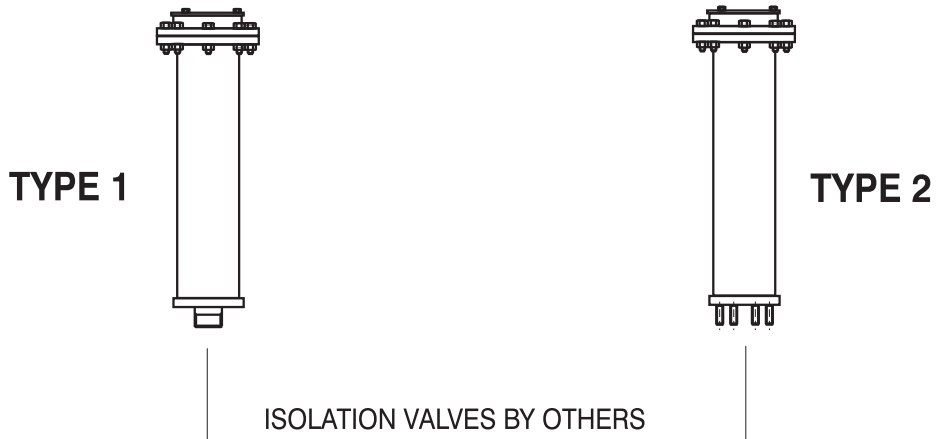
The considerable sewage/effluent free area obviates the possibility of leaks that could otherwise be caused by solids entering the sealing areas.

## 5. VACUUM RELIEF (AIR INTAKE) - PIPELINE DRAINING

When the internal pipeline pressure reduces to atmosphere the "Anti - Surge " mechanism and control float assembly drops, opens the large orifice and allows the pipeline to take in air to displace the draining media so as to prevent undesirable low negative pressure\*. The hollow, smooth side float design discourages adherence of solids and viscous substances which, therefore, tend to withdraw from the valve into the pipeline when draining occurs.

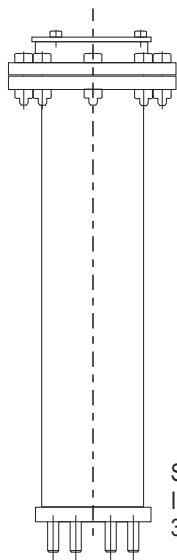
**\*NOTE:** Negative pressure values are dependant on valve size selection.

**RECOMMENDED INSTALLATION ARRANGEMENTS**



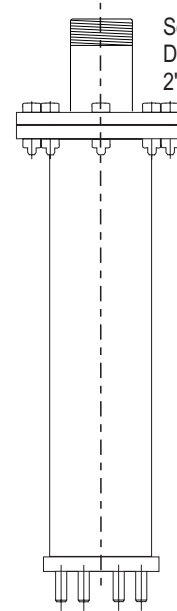
**TYPICAL VALVE CHAMBER**

## AVAILABLE DISCHARGE / INLET CONNECTIONS 2" TO 8" 10" & 12" VALVES AVAILABLE ON REQUEST

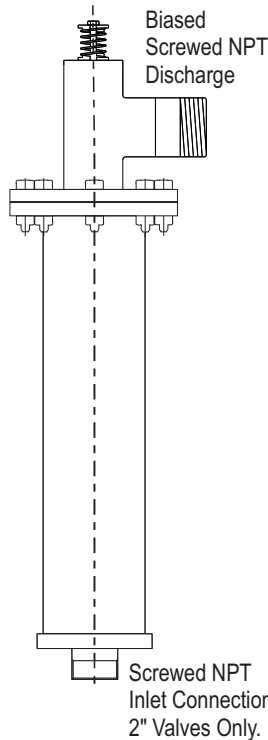


Standard Discharge Connection. Screen Mesh On Outlet.  
2", 3", 4", 6", 8", 10" & 12"

NOTE: 2" to 4" have NPT thread under the screen.



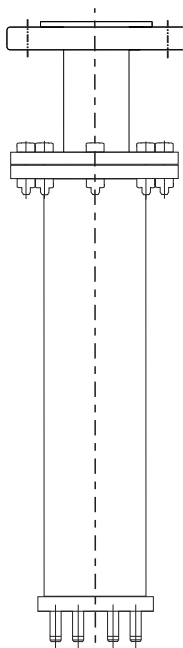
Screwed NPT Discharge Connection.  
2", 3" & 4" Valves Only.



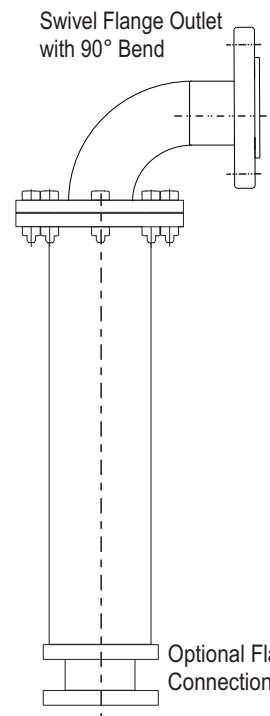
Biased Screwed NPT Discharge

Studded Inlet Connection.  
3", 4", 6", 8", 10" & 12"

Screwed NPT Inlet Connection.  
2" Valves Only.



Swivel Flange Outlet Connection \*



Swivel Flange Outlet with 90° Bend

Optional Flanged Trophy Inlet Connection for all sizes

\*NOTE  
Discharge Connections Are Equal To Valve Pressure Rating

Information subject to change

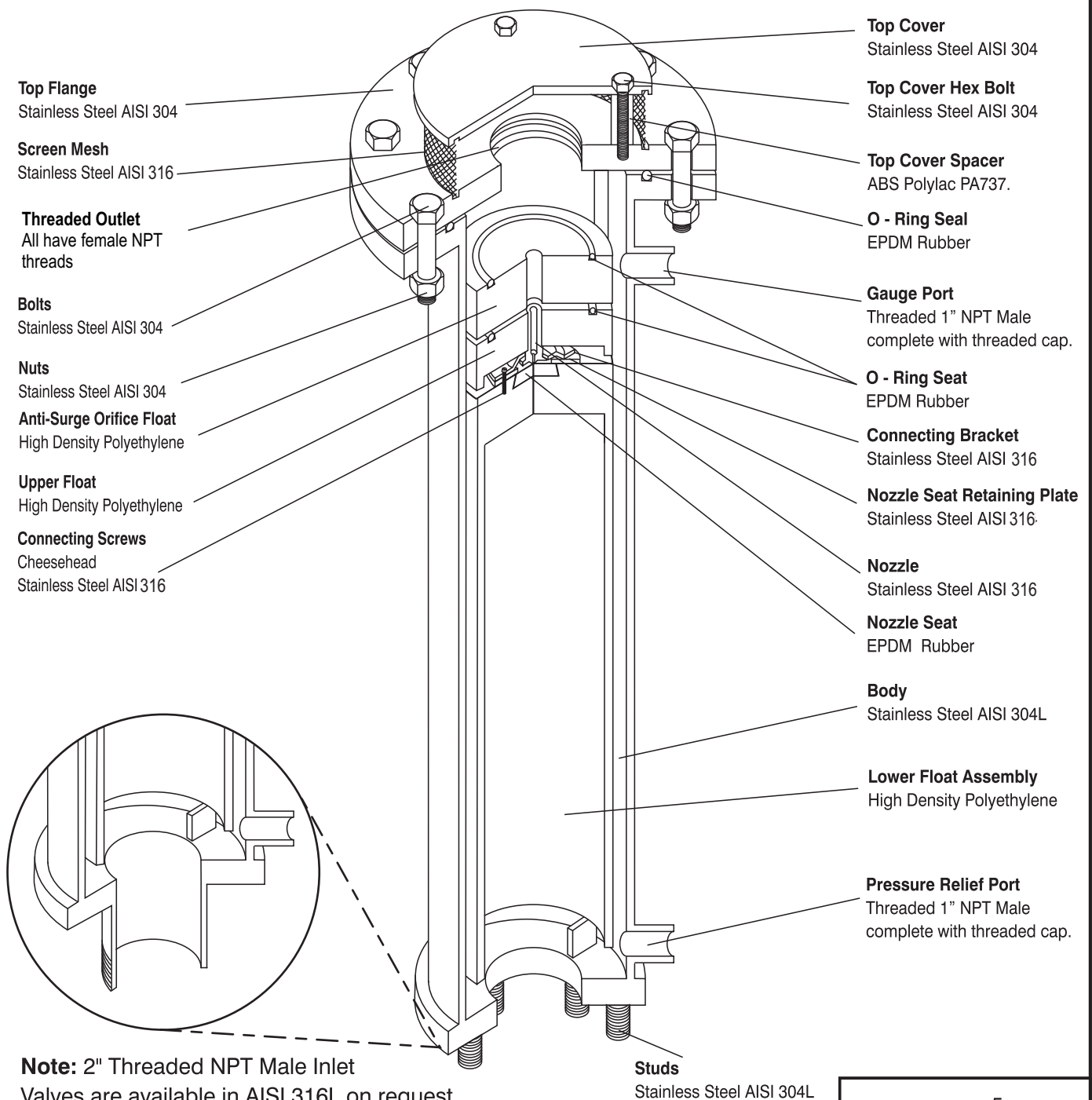
**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION**  
**THREADED 2" & STUDED INLET - 3" TO 4"**

**Type:**  
Series RGX - Double Orifice (Small & Large Orifice)  
with "Anti-Surge" Mechanism.

**End Connection:**  
Flange with Threaded NPT Male - 2" valves.  
Flange with Screwed Studs - 3" & 4" valves.

**Nominal Sizes:**  
2"  
3"  
4"

**Model No:**                      **Pressure Ratings:**  
RGX 1021 \_\_\_\_\_ 145 psi  
RGX 1031 \_\_\_\_\_ 145 psi



**Note:** 2" Threaded NPT Male Inlet  
Valves are available in AISI 316L on request.

Information subject to change without prior notice



## COMPONENT DESCRIPTION & MATERIAL SPECIFICATION THREADED 2" & STUDED INLET - 3" TO 4" EXPANDED BODY

**Type:**  
Series RGX - Double Orifice (Small & Large Orifice)  
with "Anti-Surge" Mechanism.

**End Connection:**  
Flange with Threaded NPT Male 2" valves.  
Flange with Screwed Studs 3" & 4" valves.

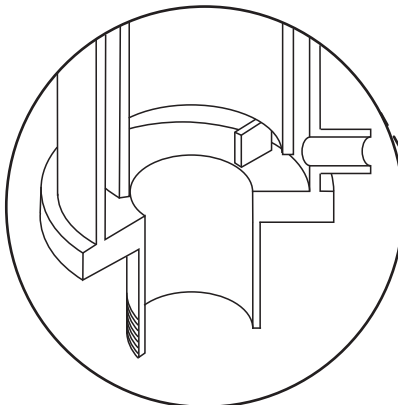
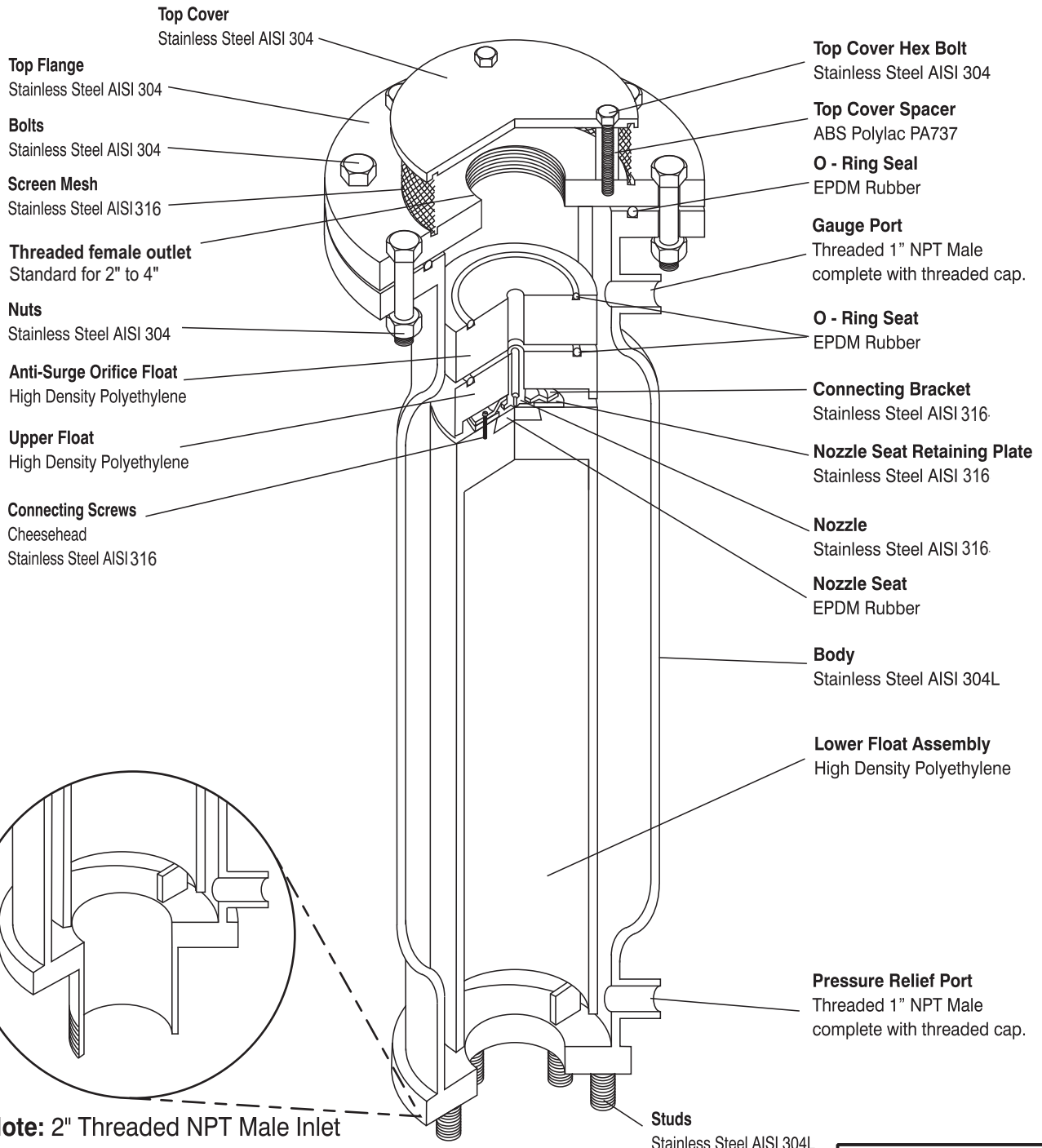
**Nominal Sizes:**

2"  
3"  
4"

**Model No's:**

RGX 1621 \_\_\_\_\_ 232 psi  
RGX 1631 \_\_\_\_\_ 232 psi

**Pressure Ratings:**



**Note:** 2" Threaded NPT Male Inlet  
Valves are available in AISI 316L on request.

Information subject to change without prior notice

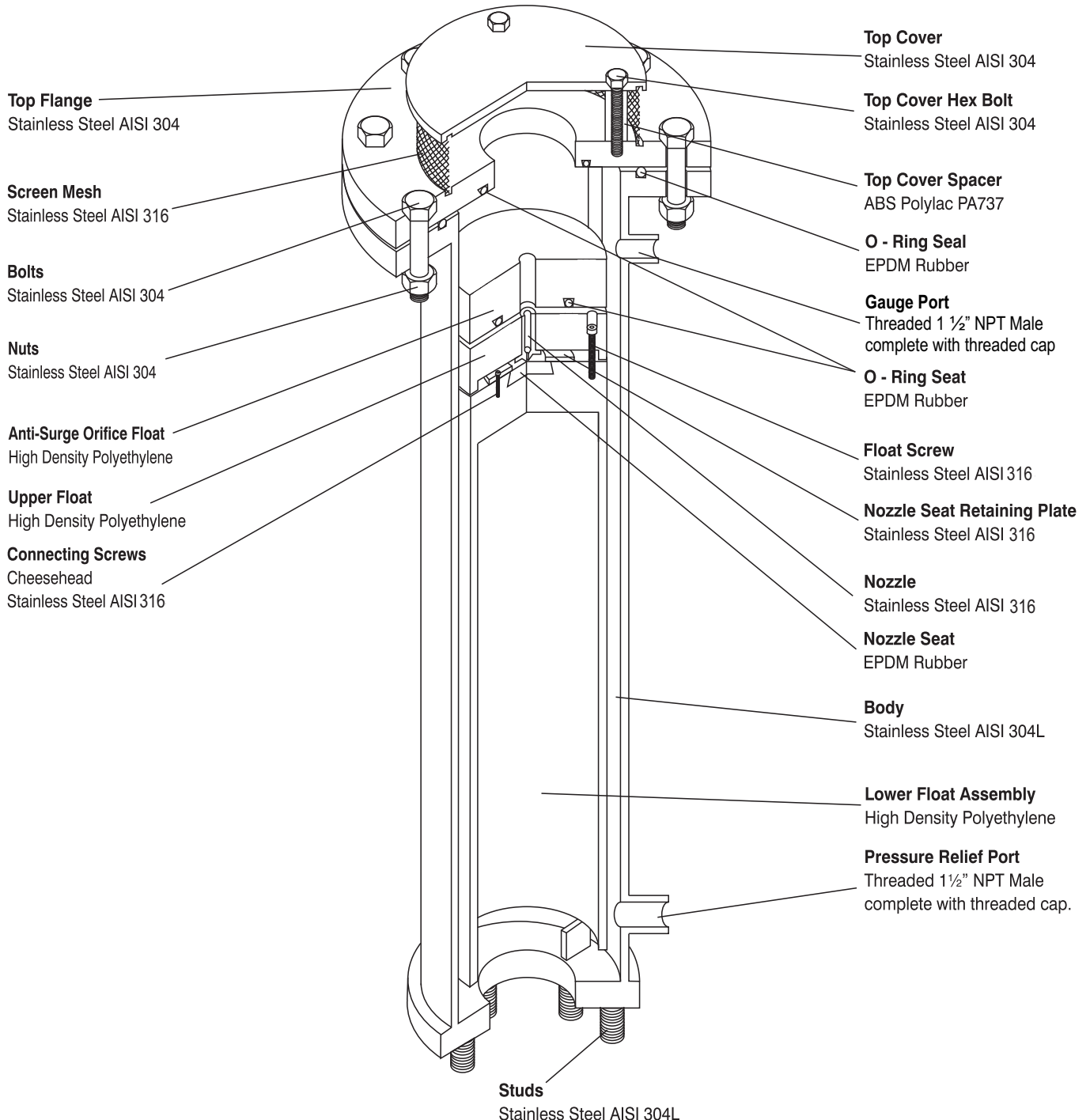
**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION**  
**STUDED INLET - 6" & 8"**

**Type:**  
Series RGX - Double Orifice (Small & Large Orifice)  
with "Anti-Surge" Mechanism.

**End Connection:**  
Flange with Screwed Studs - 6" & 8" valves.

**Nominal Size:**  
6"  
8"

**Model No:** RGX 1031 \_\_\_\_\_  
**Pressure Rating:** 145 psi



**Note:** Valves are available in AISI 316L on request.

Information subject to change without prior notice

page: 7  
revision date: Aug'14

**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION**  
**STUDED INLET - 6" TO 8" EXPANDED BODY**

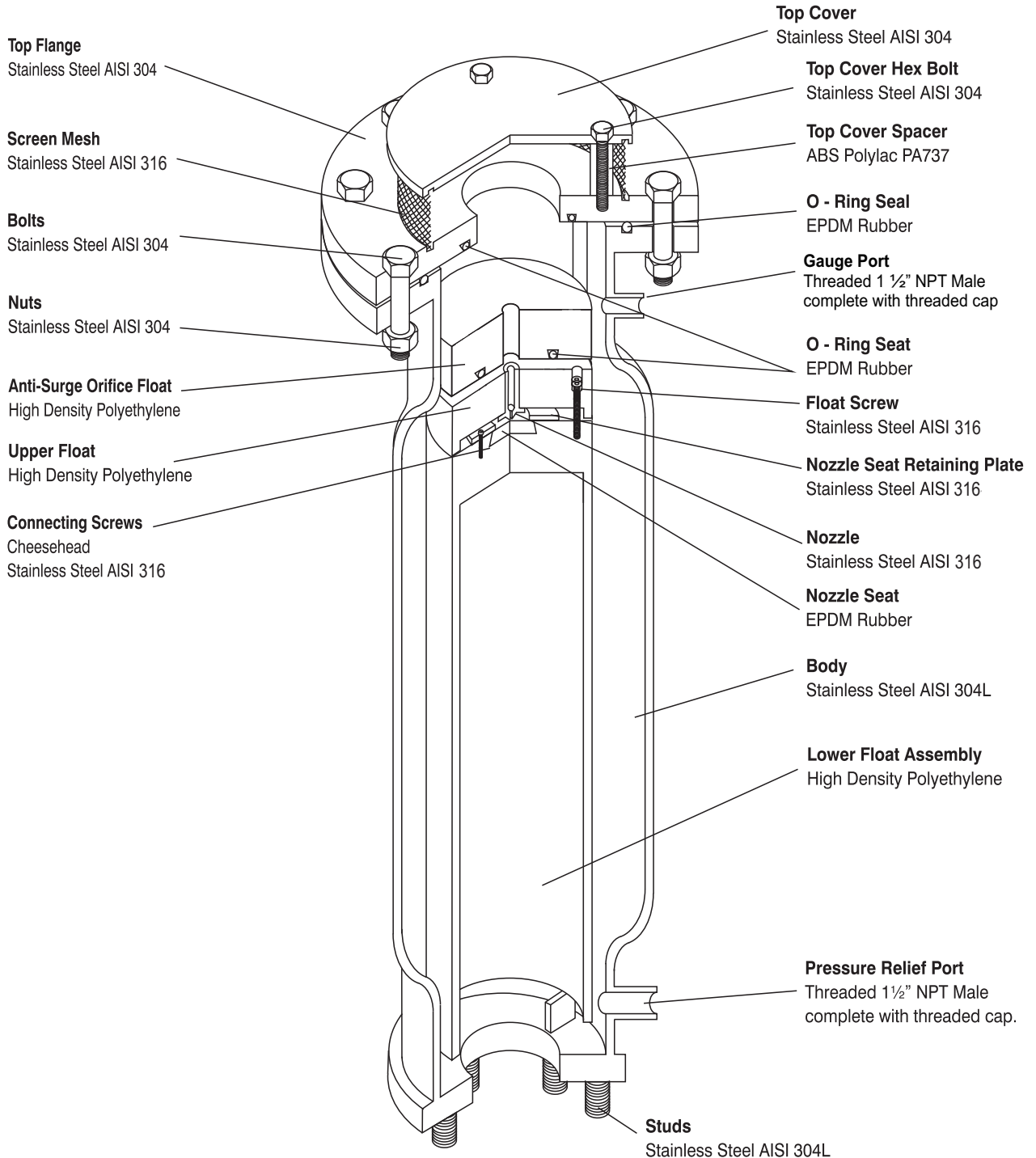
**Type:**  
Series RGX - Double Orifice (Small & Large Orifice)  
with "Anti-Surge" Mechanism.

**End Connection:**  
Flange with Screwed Studs - 6" & 8" valves.

**Nominal Sizes:**  
6"  
8"

**Model No's:**  
RGX 1631 \_\_\_\_\_

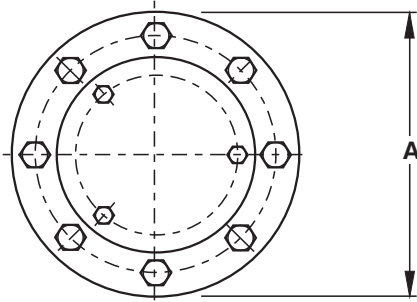
**Pressure Ratings:**  
232 psi



**Note:** Valves are available in AISI 316L on request.

Information subject to change without prior notice

## GENERAL SPECIFICATIONS THREADED 2" & STUDDED INLET - 3" TO 8"



**Type:**

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

**End Connection:**

Flange with 2" Male NPT Threaded and Screwed Studs for Alignment to ANSI B16.5 Class 150 for 3" to 8".

**Nominal Sizes:**

2", 3", 4", 6" & 8"

**Model No's:**

RGX 1021 \_\_\_\_\_ 145 psi  
RGX 1031 \_\_\_\_\_ 145 psi

**Pressure Ratings psi :**

**Operating Pressure Range - psi :**

145 psi \_\_\_\_\_ 7.2 \_\_\_\_\_ 145  
Min Max.

**Function:**

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

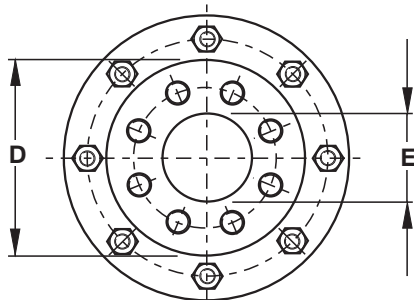
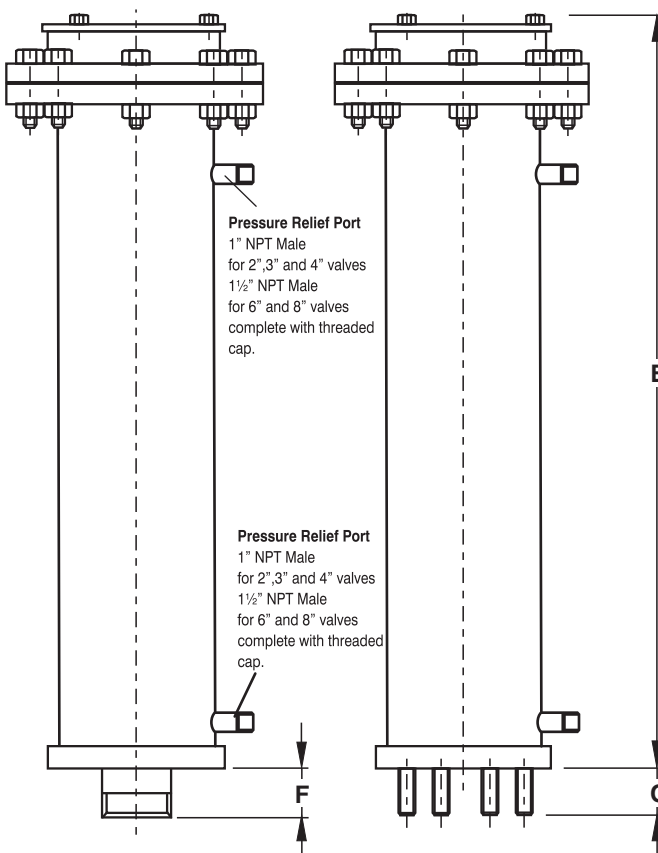
**Valve Selection:-** see pages 11 & 12

**Materials of Construction:-** see pages 5 & 7

**Installation:-** see page 3

**Standard Factory Tests:**

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



## OVERALL DIMENSIONS & WEIGHTS

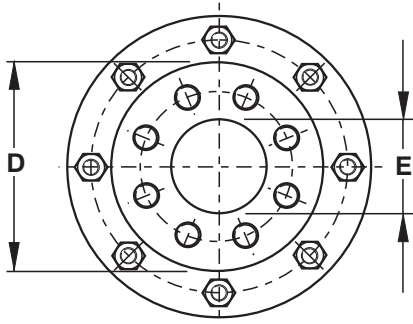
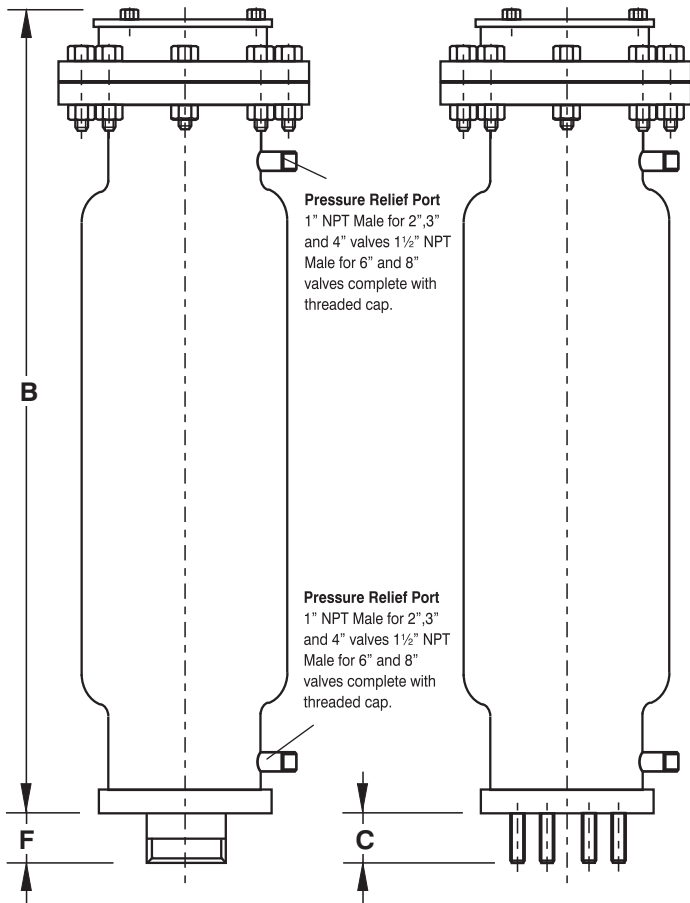
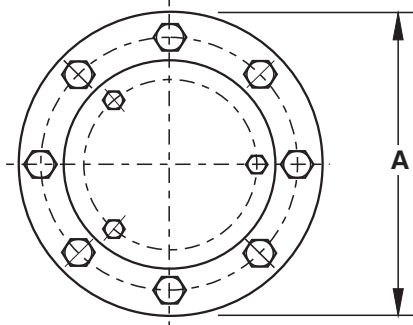
DN	Model No.	A	B	C	D	E	F	Weight Lbs
2	050 RGX 1021	8 2/3	30 3/8	N/A	5	2	1 2/3	39.7
3	080 RGX 1031	11 1/4	30 7/10	2 1/8	7 7/8	3	N/A	80.5
4	100 RGX 1031	11 1/4	30 7/10	2 1/8	8 2/3	4	N/A	79.4
6	150 RGX 1031	15 9/16	41 7/10	2 1/8	11	6	N/A	180.8
8	200 RGX 1031	17 1/2	41 7/10	2 1/8	13 6/16	8	N/A	227

Note: 2" valves have 2" NPT male inlet connections as standard.

Information subject to change without prior notice

## GENERAL SPECIFICATIONS

### THREADED 2" & STUDED INLET - 3" TO 8" EXPANDED BODY



**Type:**

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

**End Connection:**

Flange with 2" Male NPT Threaded and Screwed Studs for Alignment to ANSI B16.5 Class 150 for 3" to 8".

**Nominal Sizes:**

2", 3", 4", 6" & 8"

**Model No's:**

RGX 1621 \_\_\_\_\_ 232 psi

RGX 1631 \_\_\_\_\_ 232 psi

**Pressure Ratings psi:**

**Operating Pressure Range - psi :**

232 psi \_\_\_\_\_ **Min** 7.2 \_\_\_\_\_ **Max.** 232

**Function:**

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

**Valve Selection:-** see pages 11 & 12

**Materials of Construction:-** see pages 6 & 8

**Installation:-** see page 3

**Standard Factory Tests:**

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

## OVERALL DIMENSIONS & WEIGHTS

DN	Model No.	A	B	C	D	E	F	Weight lbs
2	050 RGX 1621	8 2/3	30 3/8	N/A	5	2	1 2/3	46.3
3	080 RGX 1631	11 1/4	30 7/10	2 1/8	7 7/8	3	N/A	83.7
4	100 RGX 1631	11 1/4	30 7/10	2 1/8	8 2/3	4	N/A	82.6
6	150 RGX 1631	15 9/16	41 7/10	2 1/8	11	6	N/A	186.3
8	200 RGX 1631	17 1/2	41 7/10	2 1/8	13 6/16	8	N/A	232.5

Note: 2" valves have 2" NPT male inlet connections as standard.

Information subject to change without prior notice



# SELECTION & POSITIONING

## VALVE SELECTION FROM GRAPH

All the relevant information has been condensed into one graph to enable valve selection to be simple and easy and at the same time to allow flexibility to the designer to move within certain parameters which eventually allows the most suited and economically viable valve to be selected.

**IMPORTANT NOTE:** The graph is based on vacuum breaking and limiting vacuum to 5 psi below atmospheric. It is not good practice to go below 10 psi absolute (4.4 psi differential in pipeline at sea level). The graph allows for change in altitude and hence change in atmospheric pressure and is based on the assumption that more than one valve per section is used for vacuum protection and venting

### ACTUAL SELECTION ( GRAVITY OR PUMPED PIPELINES)

Selection is based on the premise that pipelines are generally filled at a slower rate than they are drained, scoured or at which separation occurs (a maximum fill/drain ratio of 1:1).

1. Determine the maximum drainage rate in ft/s either for scouring, pipe rupture or column separation for a particular pipeline section.
2. Move vertically on the graph from the ft/s point and move horizontally from the pipe size finding the intersecting point.
3. This point should fall within the operating band of a particular valve size. Consideration must be given to the fact that the upper portion of the band approaches - 5 psi and the lower portion - 1.45 psi for each valve size, this allows the designer to see at a glance if the valve is too close to its operating limits and to select the next valve size.

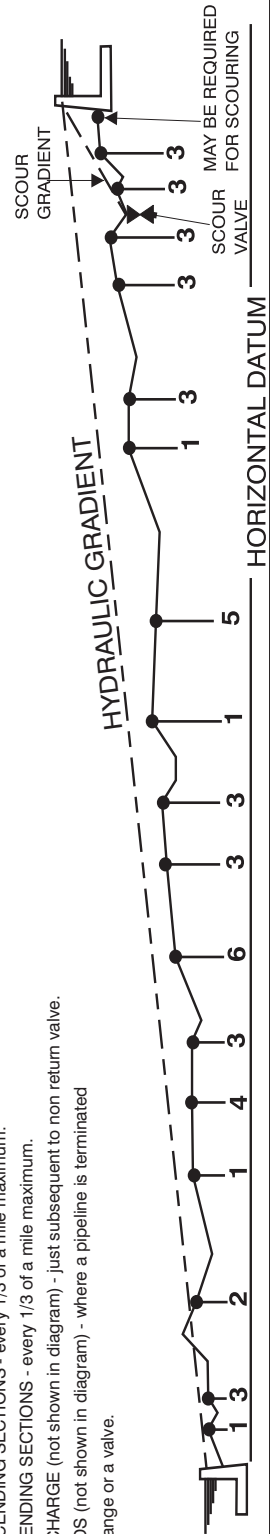
### EXAMPLE OF VALVE SIZING (ASSUMING AN INDIVIDUAL SECTION)

A Ø 16" pipeline draining at 9.84 ft/s what valve size should be selected?

From the 9.84 ft/s point move vertically until the Ø 16" pipe size horizontal line is intersected. This places the intersection point squarely in the centre of the operating band of a 3" Vent-O-Mat RGX valve. But, if for example, the drainage rate is likely to go closer to 13.12 ft/s, the valve would be operating on its limit and it may be prudent to change to a 4" Vent-O-Mat RGX.

### VALVE POSITIONING

1. ON APEX POINTS (relative to hydraulic gradient).
2. 16 FEET BELOW APEX POINTS FORMED BY INTERSECTION OF PIPELINE AND HYDRAULIC GRADIENT - i.e. where pipeline siphoning over gradient a sewage air release valve positioned on the apex would break the siphon. If positioning on apex is required a modified VENT-O-MAT Series RGX can be supplied.
3. NEGATIVE BREAKS (increase in downward slope or decrease in upward slope).
4. LONG HORIZONTAL SECTIONS - every 1/3 of a mile maximum.
5. LONG DESCENDING SECTIONS - every 1/3 of a mile maximum.
6. LONG ASCENDING SECTIONS - every 1/3 of a mile maximum.
7. PUMP DISCHARGE (not shown in diagram) - just subsequent to non return valve.
8. BLANK ENDS (not shown in diagram) - where a pipeline is terminated by a blind flange or a valve.



# **SURGE & WATERHAMMER PROTECTION**

## **Introduction**

The Vent-O-Mat Series RGX "Anti-Surge" sewage 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 liquid oscillation and elastic transient phenomena) associated with any operating pipeline. Automatic dampening, relevant to the pipeline's needs is provided by either one of three design features. These special features are unique in a pipeline component of such compact and economic design.

## **Surge Protection - Initial Filling**

The RGX incorporates the additional floating "Anti-Surge" Orifice which is aerodynamically engineered to throttle air discharge when liquid 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 liquid which consequently decelerates to a velocity which reduces the pressure rise when the valve closes (see operation of valve on pages 1 & 2). Vent-O-Mat series RGX is an essential precaution for pipeline priming.

## **Surge Protection - Pump Trip Conditions**

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

The Vent-O-Mat series RGX takes in air through the unobstructed large orifice when liquid column separation occurs, but controls the discharge of air/gas through the "Anti-Surge" Orifice as the separated column commences to rejoin. The rejoining impact velocity is thereby considerably reduced to alleviate high surge pressures in the system (see operation of valve on pages 1 & 2).

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 sewage air-valves forming an integral and valuable addition in a combined strategy for further reducing surge pressures. The benefit of the "Anti-Surge" Orifice can be readily demonstrated by suitable surge modelling 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 RGX 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 maintained 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.



# **SURGE & WATERHAMMER PROTECTION**

## **Computer Modelling**

The effectiveness of Vent-O-Mat series RGX 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 commercially available surge analysis software programmes such as SURGE 2000, PFT impulse, FLOWMASTER, TRANSAM and WATHAM.

## **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 RGX valve offers definite financial and technical advantages when incorporated as part of a holistic surge protection strategy. 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 sewage 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 are not operational.
4. Holistic protection as each sewage 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 strategies. Vent-O-Mat has built a sound relationship with many international consulting firms and has gained global recognition for selling solutions!

### SMALL ORIFICE DISCHARGE PERFORMANCE

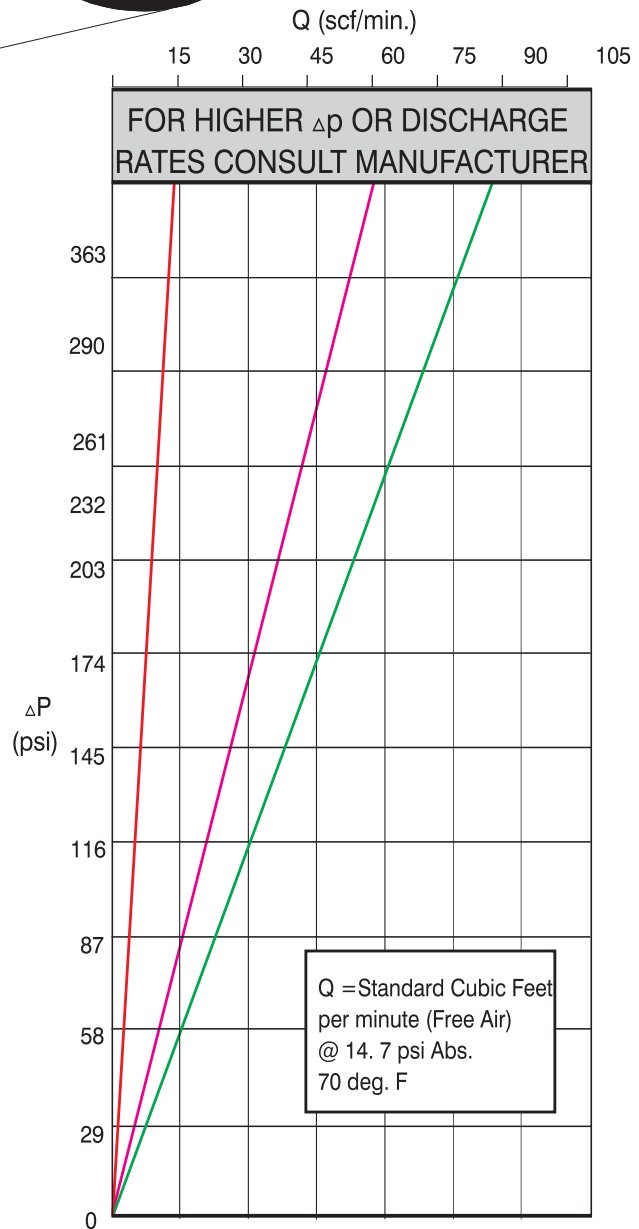
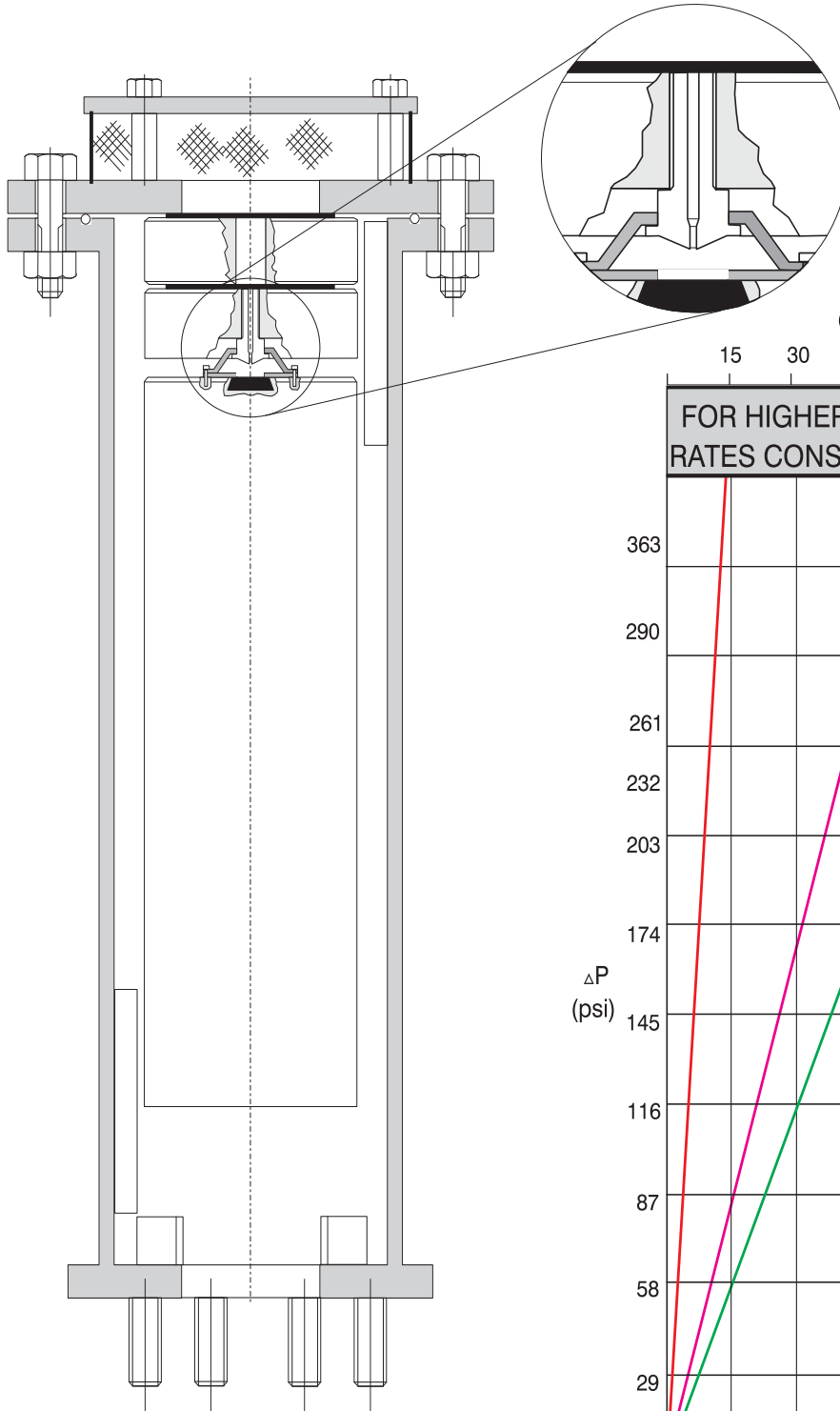
**Type:**  
Series RGX - Double Orifice (Small & Large Orifice)  
with "Anti-Surge" Orifice Mechanism

**Model No's:**  
RGX 1021/1031  
RGX 1621/1631

0.07" small orifice - 2", 3", 4" Valves

0.20" small orifice - 6" Valves

0.24" small orifice - 8" Valves



## Why?

- **“ANTI - SHOCK” - “ANTI - SURGE”** - The RGX 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 RGX 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 referenced.
- **QUALITY** - The RGX economically offers the highest quality construction and materials available in an 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 RGX design facilitates extreme ease of service and maintenance. Components 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.
- **VACUUM BREAK** - The RGX series large orifice diameters equal the nominal size of the valve, i.e., a 8" valve has a 8" orifice. This ensures the least possible resistance to the intake of air and consequently the least possible negative pressure within a draining pipeline.
- **COMPACTNESS** - Although extremely robust the RGX 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!!!

\* Council for Scientific and Industrial Research

## PURCHASE SPECIFICATION

### VENT -O- MAT MODEL NO.

Page 9 - Series RGX - 2" to 8".

Page 10 - Series RGX - 2" to 8". (Expanded Body)

### CONSTRUCTION & DESIGN

The Sewage Air Release & Vacuum Break Valve shall consist of a compact tubular all stainless steel fabricated body, hollow direct acting float and solid large orifice float in H.D.P.E. - stainless steel nozzle and woven dirt inhibitor screen, EPDM rubber seals and seat.

The valve shall have an integral "Anti-Surge" Orifice mechanism which shall operate automatically to limit transient pressure rise or shock induced by closure to less than 1.5 x valve rated working pressure.

The intake orifice area shall be equal to the nominal size of the valve i.e., a 6" valve shall have a 6" intake orifice. Large orifice sealing shall be effected by the flat face of the surge control float seating against a EPDM rubber 'O' ring housed in a dovetail groove circumferentially surrounding the orifice.

Discharge of pressurized air shall be controlled by the seating & unseating of a small orifice nozzle on a natural rubber seal affixed into the control float. The nozzle shall have a flat seating land surrounding the orifice so that damage to the rubber seal is prevented.

The valve construction shall be proportioned with regard to material strength characteristics, so that deformation, leaking or damage of any kind does not occur by submission to twice the designed working pressure.

Connection to the valve inlet shall be facilitated by flanged ends conforming to ANSI B16.5 Class 150 or NPT where applicable.

Flanged ends shall be supplied with the requisite number of stainless steel screwed studs inserted for alignment to the specified standard. **Nuts and washers shall be included.**

### OPERATION

1. Prior to the ingress of liquid into the valve chamber, as when the pipeline is being filled, valves shall vent through the large orifice when sewage/effluent approach velocities are relative to a transient pressure rise, on valve closure, of < 1.5 x valve rated pressure.

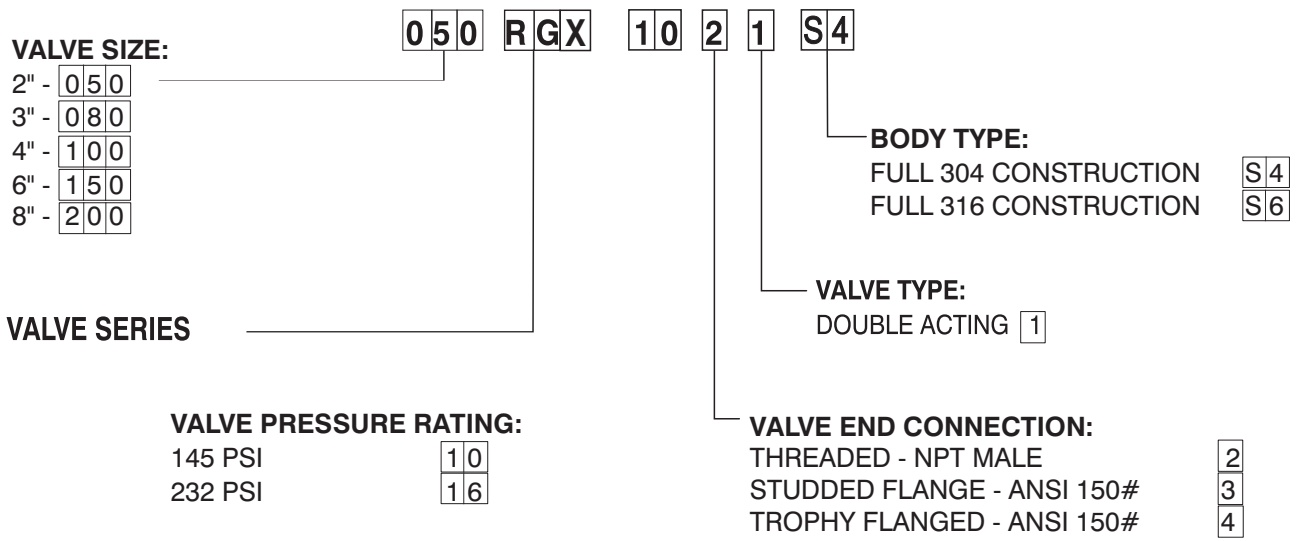
At higher sewage/effluent approach velocities, which have a potential to induce transient pressure rises > 1.5 x valve rated pressure on valve closure, the valve shall automatically discharge air/gas through the "Anti-Surge" Orifice and reduce sewage/effluent approach velocity, so that on closure a maximum Transient pressure rise of < 1.5 x valve rated pressure is realised.

2. Valves shall not exhibit leaks or weeping of liquid past the large orifice seal at operating pressures of 7.2 psi to 1.5 x valve rated working pressure.

3. Valves shall respond to the presence of air/gas by discharging it through the small orifice at any pressures within a specified design range, i.e. 7.2 psi to 145 psi and shall remain leak tight in the absence of air.

4. Valves shall react immediately to pipeline drainage or liquid column separation by the full opening of the large orifice so as to allow unobstructed air intake at the lowest possible negative internal pipeline pressure.

## ORDERING GUIDE



**Note:**

- 10" and 12" valves are available on request.

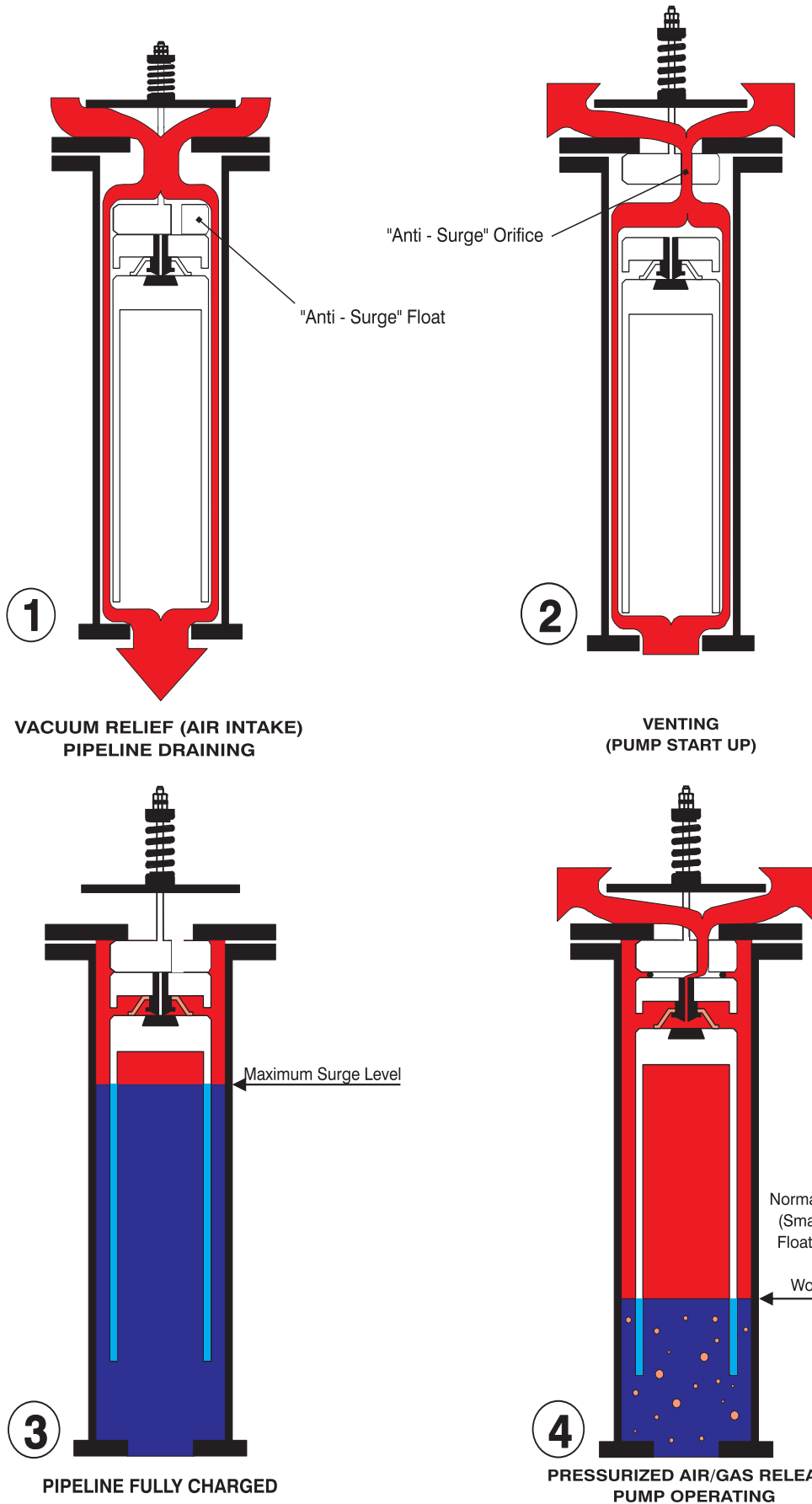
### TEST SPECIFICATION

**All air release valves supplied shall be subjected to the following testing procedures in the order laid down:**

- (A) A high pressure strength and leak test whereby the valve is filled with water and pressurized to twice the rated working pressure which shall be held for a period of 2 minutes. Any leaking, weeping or sweating shall be reason for rejection.
- (B) A low head leak test whereby the valve is filled with water and pressurized to a maximum of 7.2 psi using a visible water column connected to the test rig. The valve shall be rejected if leak tightness is not maintained for 2 minutes.
- (C) Every tenth air release valve of the same size and pressure rating must be subjected to a small orifice function test "DROP TEST" - whereby the valve is filled with water, pressurized to above rated working pressure and isolated from the test rig by closure of an isolating valve. A chamber in the test rig immediately prior to the isolating valve must be filled with compressed air at a pressure equal to that being maintained in the air release valve. The isolating valve is then opened so as to allow the air to rise in the air release valve without the pressure dropping lower than 30 - 45 psi above rated working pressure of the air release valve. The "DROP TEST" is then carried out by slowly bleeding off the pressure through a suitable cock until rated working pressure is reached and the float drops away from the orifice to allow discharge. Failure of the air release valve to function in the manner described will be reason for rejection.

On request the manufacturer shall provide batch certificates of test compliance which shall be cross referenced to serial numbers indelibly marked onto the identity label of each valve.

**IMPORTANT NOTE:** It is impossible to inject air into an incompressible liquid, air injection can only be achieved if the liquid can be displaced which implies that the pressure in the test rig must be reduced to atmospheric, and absolutely nothing is proven by discharge through the small orifice of the air release valve at atmospheric pressure. "DROP TESTING" in this manner is not acceptable.



**PRE NOTES:**

It is good engineering practice to install a sewage air valve prior to the pump discharge check valve, on vertical turbine pumps and deepwell submersible pump applications. The purpose of these valves are to control air/gas entry into the main pipeline on initial pump start up and to fully break vacuum in the vertical riser upon pump shutoff.

Operation of conventional sewage air valves in this application is such that the air in the vertical riser is released very rapidly upon pump startup, resulting in very high pressure transients when the liquid column slams the sewage air valve shut and/or slams into the closed discharge check valve.

The Vent-O-Mat Series RGXb valve has specifically been developed for use on deep well submersible pump and vertical turbine pump applications where they are installed prior to the pump discharge check valve to fulfill the following functions:

- ˘ Provide effective release of air/gas in the vertical riser upon pump startup.
- ˘ Dampen surge pressures upon startup.
- ˘ Provide vacuum protection when the pump stops and the vertical column drains.

**1. VACUUM RELIEF (AIR INTAKE)**

Upon pump stop, the discharge check valve closes. Sewage/effluent drains from the sewage air valve and the pump's vertical column. The negative differential created by the draining liquid causes atmospheric air to push the "Anti-Surge" Float down, opening the Large Orifice and allows air to displace the draining liquid to prevent potentially damaging internal negative pressure\*.

The hollow smooth side float design, discourages the adherence of solids and viscous substances which, therefore tend to withdraw from the valve into the pipeline when draining occurs.

**2. VENTING (PUMP START UP)**

Air/gas is forced through the "Anti-Surge" Orifice resulting in the deceleration of the approaching liquid column due to the resistance of rising air pressure in the valve.

This dampens transients when the sewage air valve closes and the liquid column opens the discharge check valve.

**3. PRESSURIZED AIR RELEASE FROM A FULL PIPELINE**

Sewage/effluent has entered the valve chamber and buoyed the floats to close both the "Anti-Surge" orifice and the small orifice. The design's compression/volume relationship prevents the media from ever exceeding the maximum surge level indicated in diagram 3. The resultant sewage/effluent free area protects against the fouling of the orifice seals by solids or high viscous substances.

**4. PRESSURIZED AIR RELEASE (PUMP OPERATING)**

The volume of disentrained air/gas increases in the valve and displaces the sewage/effluent level to the lower, normal operating level (small orifice control float buoyancy level.) Any additional lowering of the sewage/effluent level, as would occur when more air/gas enters the valve, will result in the control float dropping away from the small orifice through which pressurized air/gas is then being discharged to atmosphere.

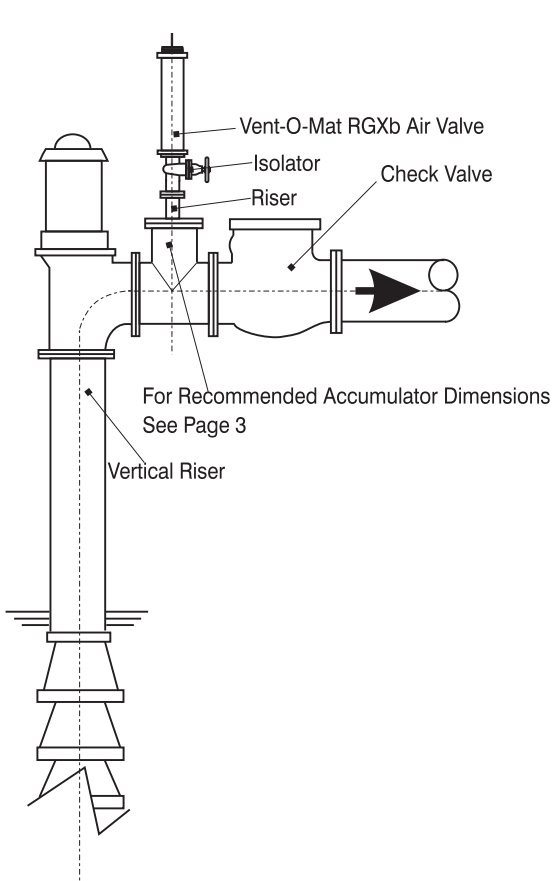
The control float will close the small orifice when sufficient air/gas has been released to restore the sewage/effluent level to the normal operating level.

The considerable sewage/effluent free area obviates the possibility of leaks that could otherwise be caused by solids entering the sealing areas.

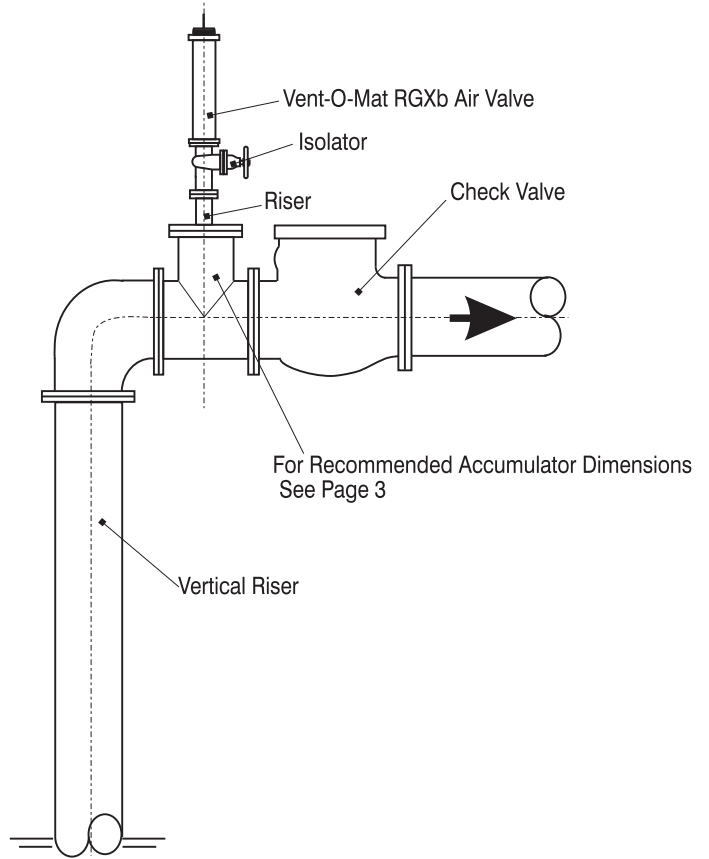
**\*Note:**

A differential pressure of less than 0.7 psi across the large orifice is required to open the valve fully under vacuum conditions.

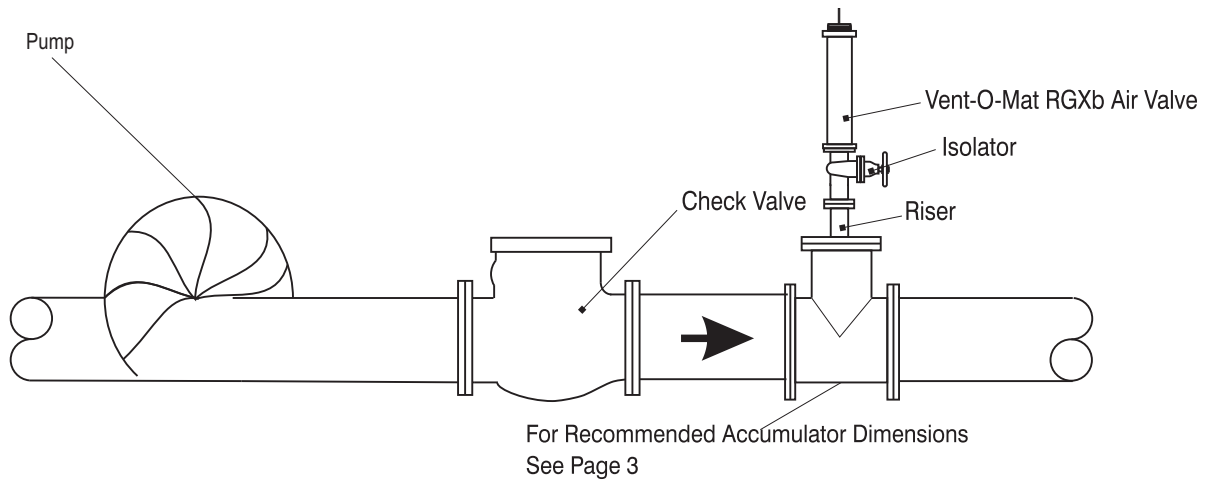
# RECOMMENDED INSTALLATION ARRANGEMENTS



**VERTICAL TURBINE  
PUMP APPLICATION**



**SUBMERSIBLE/DEEP WELL  
APPLICATION**



**CENTRIFUGAL PUMP APPLICATION**



## COMPONENT DESCRIPTION & MATERIAL SPECIFICATION THREADED 2" & STUDED INLET - 3" TO 4"

**Type:**

Series RGXb -Double Orifice (Small & Large Orifice) with Bias Mechanism

**End Connection:**

Flange with Threaded NPT Male - 2" valves.

Flange with Screwed Studs - 3" & 4" valves.

**Nominal Sizes:**

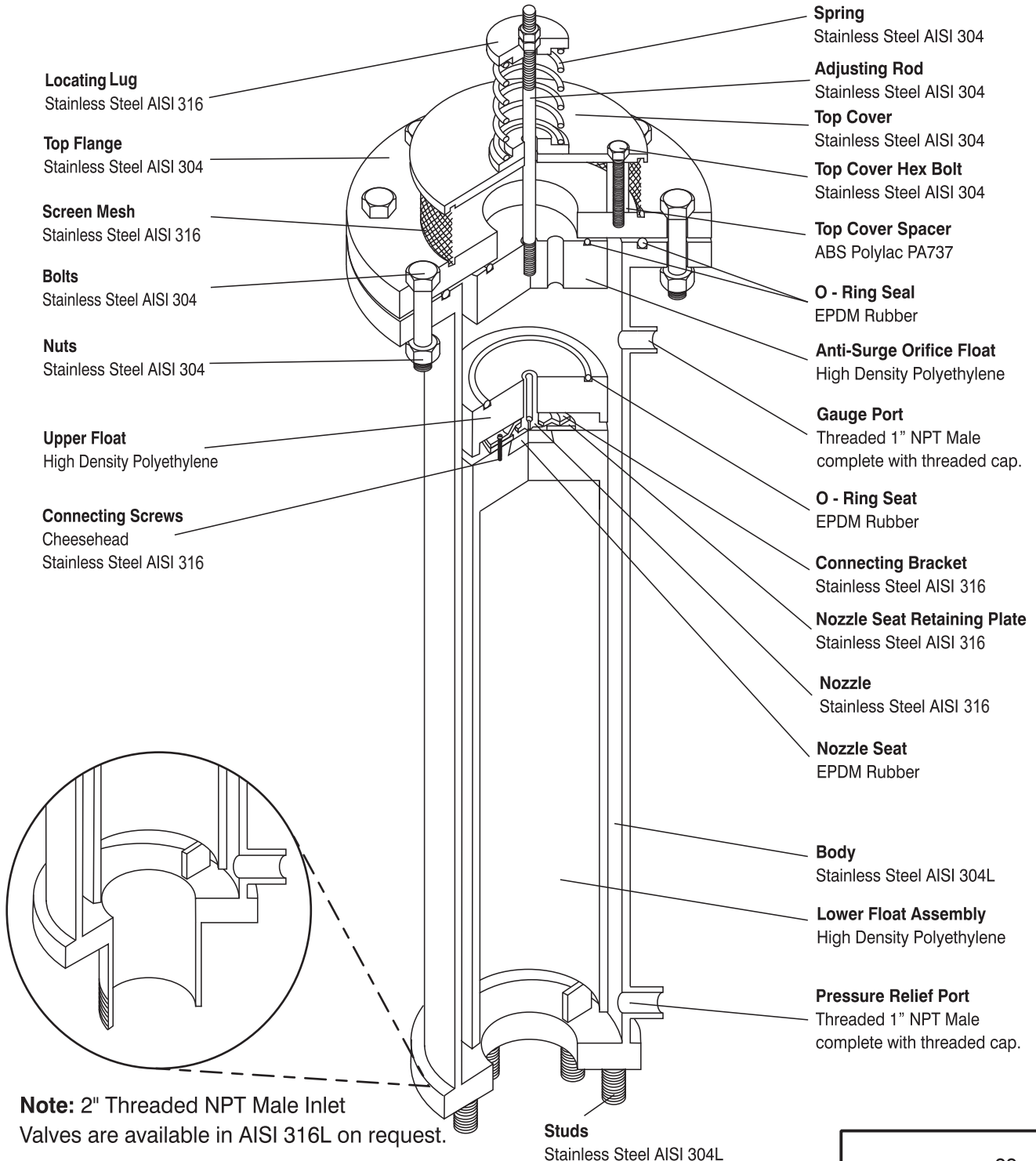
2"  
3"  
4"

**Model No's:**

RGXb 1021 \_\_\_\_\_ 145 psi  
RGXb 1031 \_\_\_\_\_ 145 psi

**Pressure Ratings:**

145 psi  
145 psi



**Note:** 2" Threaded NPT Male Inlet  
Valves are available in AISI 316L on request.

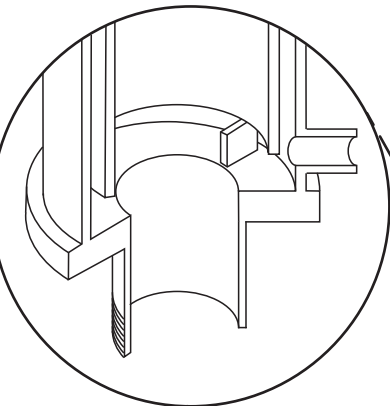
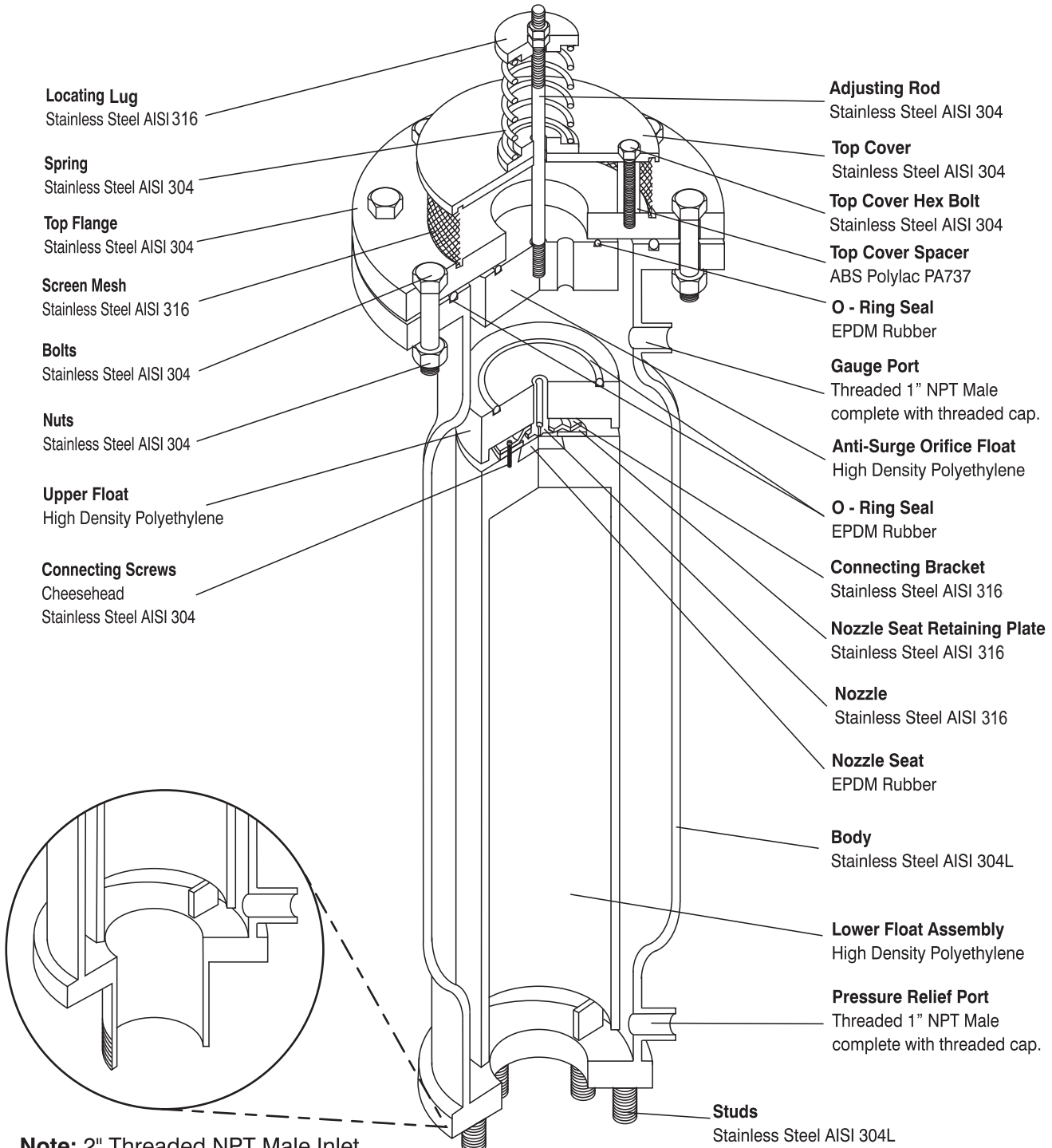
### COMPONENT DESCRIPTION & MATERIAL SPECIFICATION THREADED 2" & STUDED INLET - 3" TO 4" EXPANDED BODY

**Type:**  
Series RGXb - Double Orifice (Small & Large Orifice)  
with Bias Mechanism

**End Connection:**  
Flange with Threaded NPT Male - 2" valves.  
Flange with Screwed Studs - 3" & 4" valves.

**Nominal Sizes:**  
2"  
3"  
4"

**Model No's:**                      **Pressure Ratings:**  
RGXb 1621 \_\_\_\_\_ 232 psi  
RGXb 1631 \_\_\_\_\_ 232 psi



**Note:** 2" Threaded NPT Male Inlet  
Valves are available in AISI 316L on request.  
Information subject to change without prior notice

### COMPONENT DESCRIPTION & MATERIAL SPECIFICATION STUDED INLET - 6" TO 8"

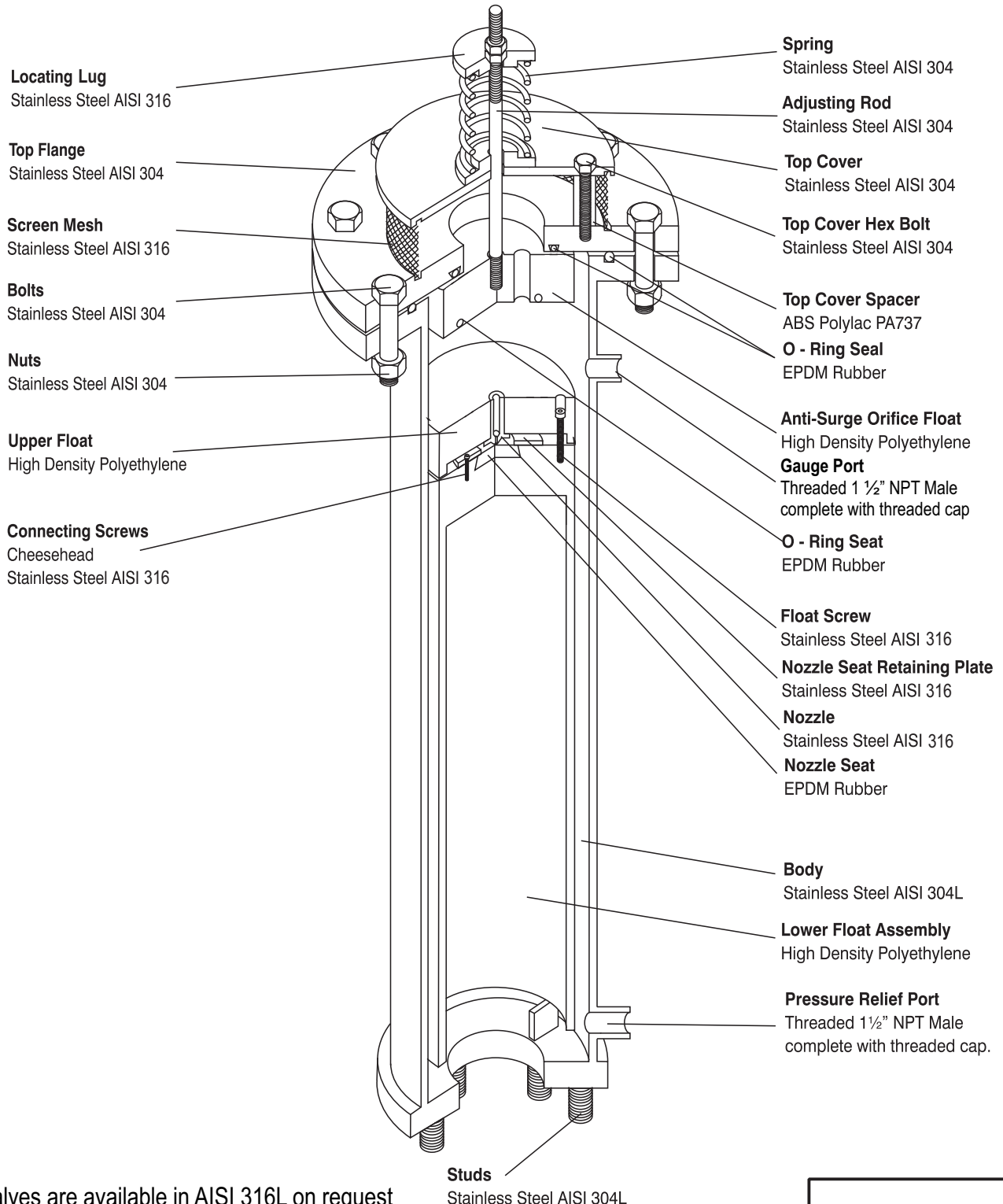
**Type:**  
Series RGXb -Double Orifice (Small & Large Orifice)  
with Bias Mechanism

**End Connection:**  
Flange with Screwed Studs - 6" & 8" valves.

**Nominal Sizes:**  
6"  
8"

**Model No's:**  
RGXb 1031 \_\_\_\_\_

**Pressure Ratings:**  
145 psi



Valves are available in AISI 316L on request

Information subject to change without prior notice

**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION**  
**STUDED INLET - 6" TO 8" EXPANDED BODY**

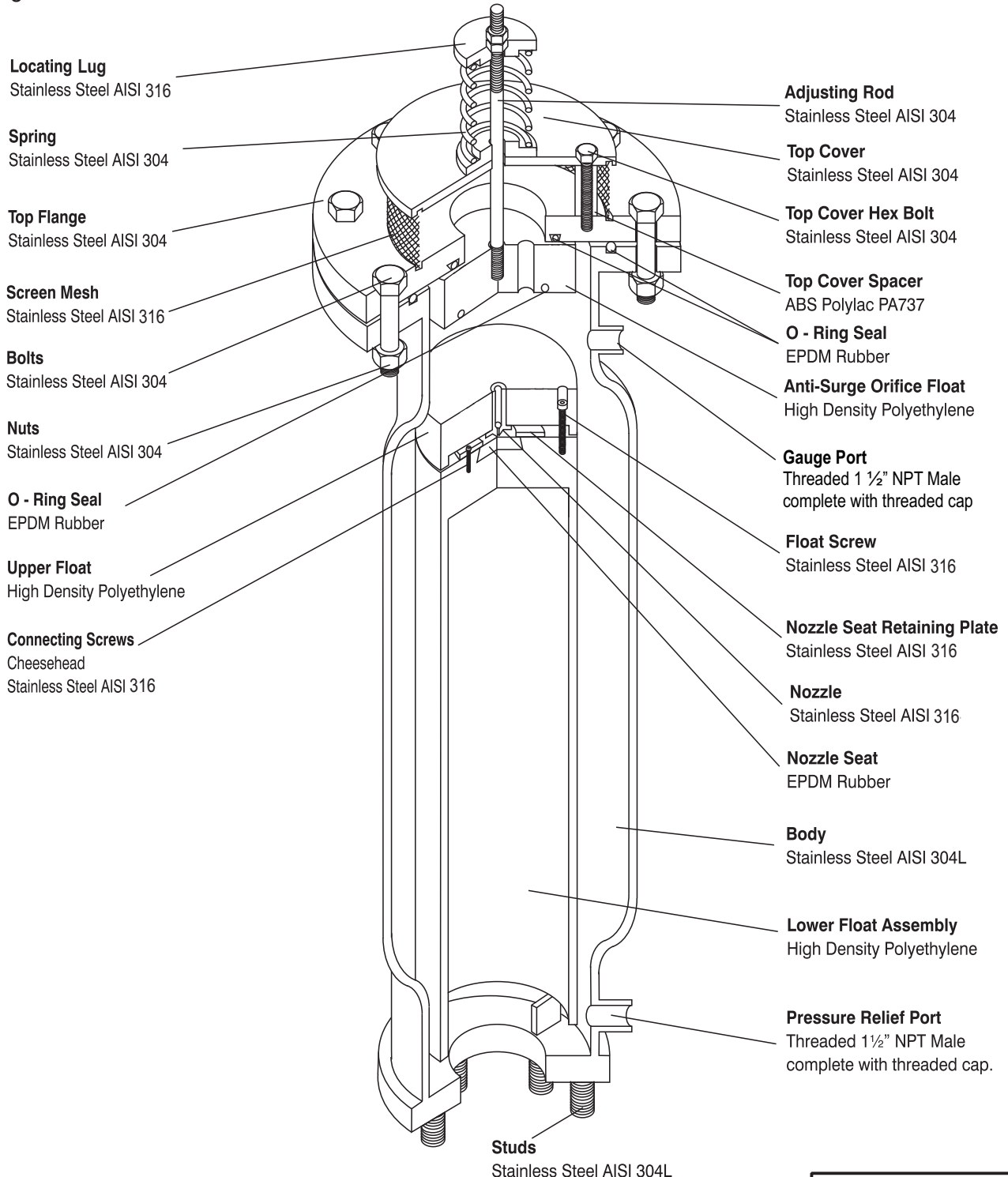
**Type:**  
Series RGXb - Double Orifice (Small & Large) with Bias Mechanism

**End Connection:**  
Flange with Screwed Studs - 6" & 8" valves.

**Nominal Sizes:**  
6"  
8"

**Model No's:**  
RGXb 1631 \_\_\_\_\_

**Pressure Ratings:**  
232 psi

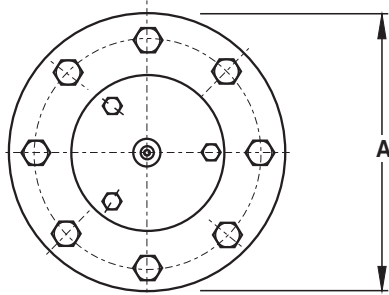


Valves are available in AISI 316L on request

Information subject to change without prior notice

### GENERAL SPECIFICATIONS

#### THREADED 2" & STUDED INLET - 3" TO 8"



**Type:**

Double Orifice (Small & Large Orifice) with *Bias* mechanism for large volume air intake and controlled air discharge.

**End Connection:**

Flange with 2" Male NPT Threaded and Screwed Studs for Alignment to ANSI B16.5 Class 150 for 3" to 8".

**Nominal Sizes:**

2", 3", 4", 6" & 8"

**Model No's:**

RGXb 1021 \_\_\_\_\_ 145 psi  
 RGXb 1031 \_\_\_\_\_ 145 psi

**Pressure Ratings - psi:**

**Operating Pressure Range - psi:**

	Min	Max.
145 psi _____	7.2	145

**Function:**

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

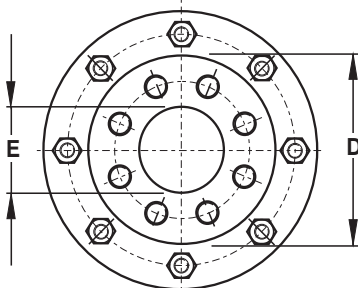
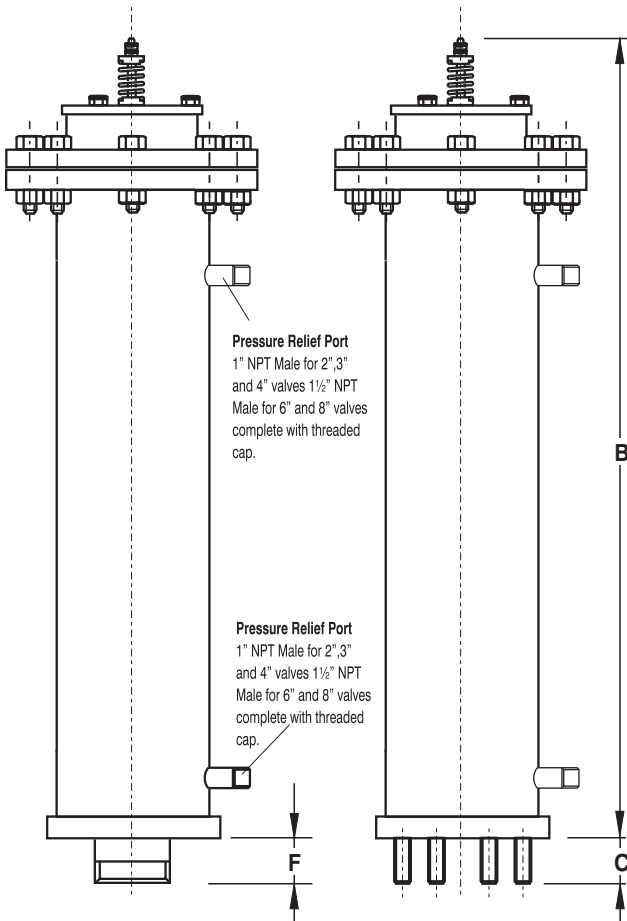
**Valve Selection:-** see pages 11 & 12

**Materials of Construction:-** see pages 22 & 24

**Installation:-** see page 21

**Standard Factory Tests:**

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



### OVERALL DIMENSIONS & WEIGHTS

DN	Model No.	A	B	C	D	E	F	Weight lbs
2	050 RGXb 1021	8 2/3	33 7/16	N/A	5	2	1 2/3	39.9
3	080 RGXb 1031	11 1/4	34 7/8	2 1/8	7 7/8	3	N/A	80.9
4	100 RGXb 1031	11 1/4	34 7/8	2 1/8	8 2/3	4	N/A	79.8
6	150 RGXb 1031	15 9/16	48 4/10	2 1/8	11	6	N/A	181.7
8	200 RGXb 1031	17 1/2	48 4/10	2 1/8	13 6/16	8	N/A	227.9

### GENERAL SPECIFICATIONS

### THREADED 2" & STUDED INLET - 3" TO 8" EXPANDED BODY

**Type:**

Double Orifice (Small & Large Orifice) with *Bias* mechanism for large volume air intake and controlled air discharge.

**End Connection:**

Flange with 2" Male NPT Threaded and Screwed Studs for Alignment to ANSI B16.5 Class 150 for 3" to 8".

**Nominal Sizes:**

2", 3", 4", 6" & 8"

**Model No's:**

RGXb 1621 \_\_\_\_\_ 232 psi

RGXb 1631 \_\_\_\_\_ 232 psi

**Pressure Ratings - psi:**

**Operating Pressure Range - psi:**

	Min	Max.
232 psi _____	7.2	232

**Function:**

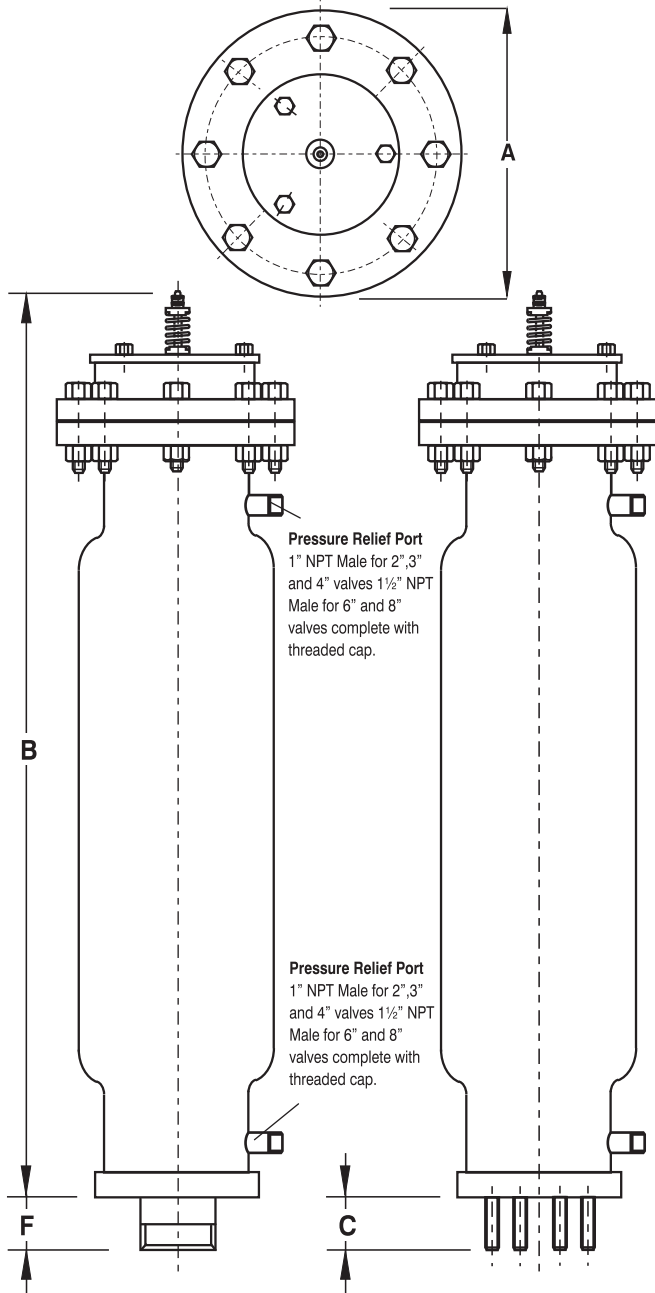
- i) High volume air intake - pipeline draining
- ii) Pressurized air/gas discharge - pipeline filled.
- iii) Controlled air discharge - pipeline filling
- iv) Surge dampening - high velocity air/gas discharge, liquid column separation & liquid oscillation

**Valve Selection:-** see pages 11 & 12

**Materials of Construction:-** see pages 23 & 25

**Standard Factory Tests:**

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



Pressure Relief Port  
1" NPT Male for 2", 3"  
and 4" valves 1½" NPT  
Male for 6" and 8"  
valves complete with  
threaded cap.

Pressure Relief Port  
1" NPT Male for 2", 3"  
and 4" valves 1½" NPT  
Male for 6" and 8"  
valves complete with  
threaded cap.

### OVERALL DIMENSIONS & WEIGHTS

DN	Model No.	A	B	C	D	E	F	Weight lbs
2	050 RGXb 1621	8 <sup>2</sup> / <sub>3</sub>	33 <sup>7</sup> / <sub>16</sub>	N/A	5	2	1 <sup>2</sup> / <sub>3</sub>	46.5
3	080 RGXb 1631	11 <sup>1</sup> / <sub>4</sub>	34 <sup>7</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	3	N/A	84.1
4	100 RGXb 1631	11 <sup>1</sup> / <sub>4</sub>	34 <sup>7</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	8 <sup>2</sup> / <sub>3</sub>	4	N/A	83
6	150 RGXb 1631	15 <sup>9</sup> / <sub>16</sub>	48 <sup>4</sup> / <sub>10</sub>	2 <sup>1</sup> / <sub>8</sub>	11	6	N/A	187.2
8	200 RGXb 1631	17 <sup>1</sup> / <sub>2</sub>	48 <sup>4</sup> / <sub>10</sub>	2 <sup>1</sup> / <sub>8</sub>	13 <sup>6</sup> / <sub>16</sub>	8	N/A	233.4

## PURCHASE SPECIFICATION

### VENT-O-MAT MODEL NO.

Page 26 - Series RGXb - 2" to 8".

Page 27 - Series RGXb - 2" to 8" (Expanded Body).

### CONSTRUCTION & DESIGN

The Sewage Air Release & Vacuum Break Valve shall consist of a compact tubular all stainless steel fabricated body, hollow direct acting float and solid large orifice float in H.D.P.E. - stainless steel nozzle and woven dirt inhibitor screen, EPDM rubber seals and seat.

The valve shall have an integral 'Anti-Surge' Orifice mechanism which shall operate automatically to limit surge pressures or shock induced by liquid oscillation and/or rapid air/gas discharge to less than 1.5 x valve rated working pressure.

The intake orifice area shall be equal to the nominal size of the valve i.e., a 6" valve shall have a 6" intake orifice. Large orifice sealing shall be effected by the flat face of the surge control float seating against a EPDM rubber 'O' ring housed in a dovetail groove circumferentially surrounding the orifice.

Discharge of pressurized air shall be controlled by the seating & unseating of a small orifice nozzle on a EPDM rubber seal affixed into the control float. The nozzle shall have a flat seating land surrounding the orifice so that damage to the rubber seal is prevented.

The valve construction shall be proportioned with regard to material strength characteristics, so that deformation, leaking or damage of any kind does not occur by submission to twice the designed working pressure

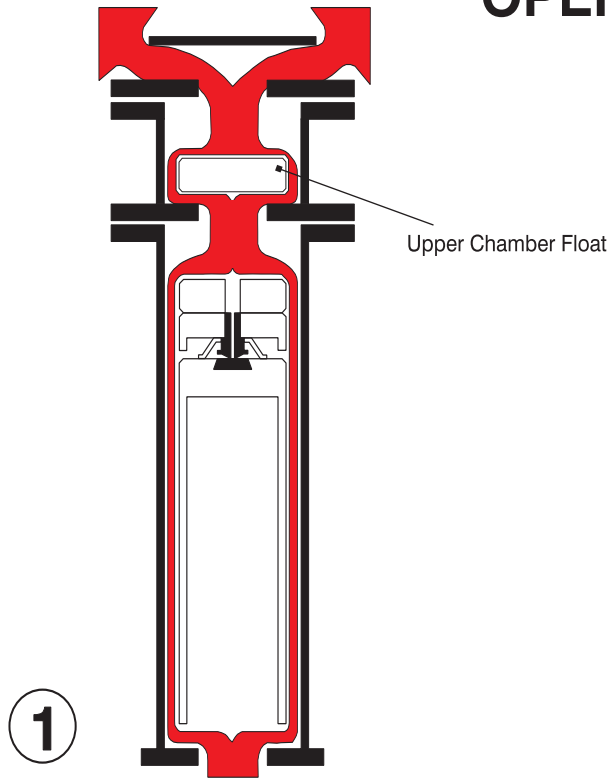
Connection to the valve inlet shall be facilitated by flanged ends conforming to ANSI B16.5 Class 150 and NPT where applicable.

Flanged ends shall be supplied with the requisite number of stainless steel screwed studs inserted for alignment to the specified standard. **Nuts and washers shall be included.**

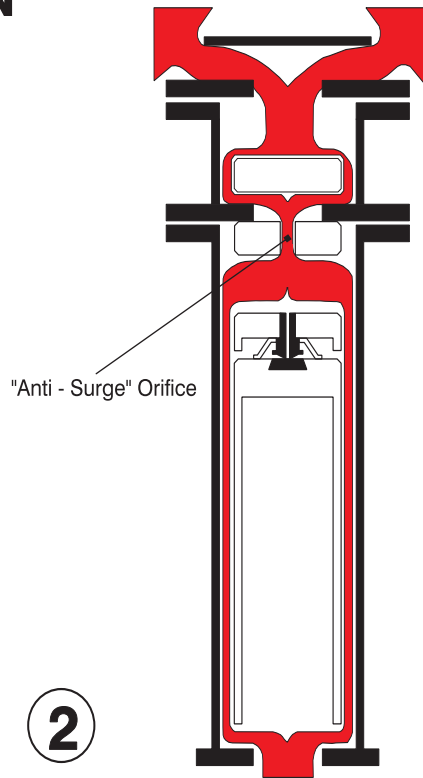
### OPERATION

1. Prior to the ingress of liquid into the valve chamber, as when the pipeline is being filled, valves shall vent through the "Anti-Surge" orifice when sewage/effluent approach velocities are relative to a transient pressure rise, on valve closure, of < 1.5 x valve rated pressure.
2. Valves shall not exhibit leaks or weeping of liquid past the large orifice seal at operating pressures of 7.2 psi to 1.5 x rated working pressure.
3. Valves shall respond to the presence of air/gas by discharging it through the small orifice at any pressures within a specified design range, i.e. 7.2 psi to 145 psi and shall remain leak tight in the absence of air.
4. Valves shall react immediately to pipeline drainage or water column separation by the full opening of the large orifice so as to allow unobstructed air intake at the lowest possible negative internal pipeline pressure.

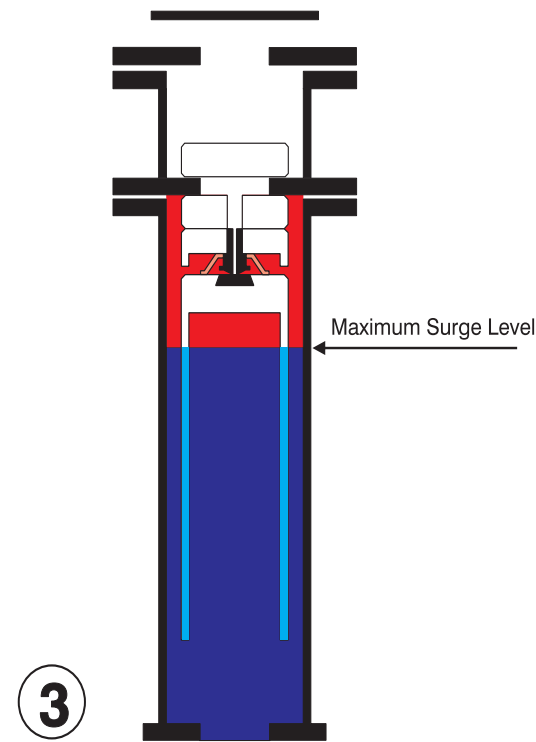
**OPERATION**



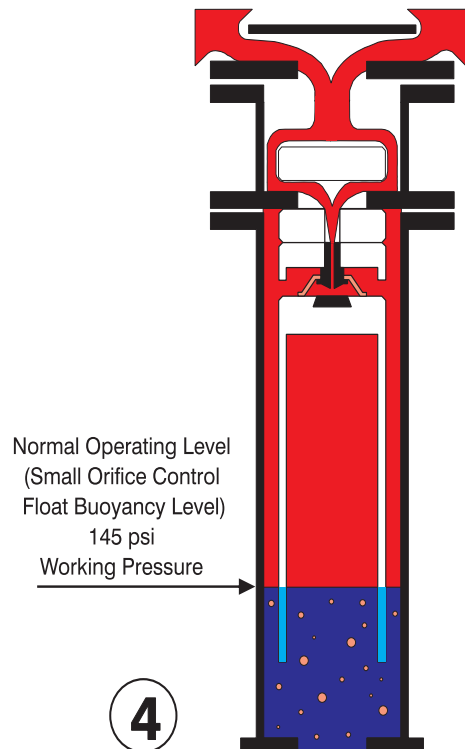
**1**  
PIPELINE FILLING  
(SUB CRITICAL SEWAGE / EFFLUENT  
APPROACH VELOCITY)



**2**  
VENTING OF A FILLING PIPELINE  
(EXCESSIVE SEWAGE / EFFLUENT  
APPROACH VELOCITY)



**3**  
PIPELINE FULLY CHARGED



**4**  
PRESSURIZED AIR/GAS RELEASE  
FROM A FULL PIPELINE



# OPERATION

## PRE NOTES:

There are instances where the hydraulic gradeline falls below a peak point during normal operation and where air inflow would adversely affect the normal operation and surge characteristic of the pipeline.

Vent-O-Mat offers the Series RGXv valve which has specifically been developed to ensure effective air/gas release under all pipeline conditions but will not allow air entry into the pipeline.

- 1. VENTING OF A FILLING PIPELINE (SUB CRITICAL LIQUID APPROACH VELOCITY)**  
Air/gas flows through the annular space between the cylindrical floats and discharges through the Large Orifice into atmosphere.\*
- 2. VENTING OF A FILLING PIPELINE (EXCESSIVE LIQUID APPROACH VELOCITY)**  
In reaction to increased air/gas flow,"Anti Surge" Float closes the large orifice and air is forced through the "Anti-Surge" orifice resulting in deceleration of the approaching liquid due to the resistance of rising air/gas pressure in the valve.
- 3. PIPELINE FULLY CHARGED**  
Sewage/effluent has entered the valve chamber and buoyed the floats to close both the "Anti-Surge" orifice and the small orifice. The design's compression/volume relationship prevents the media from ever exceeding the maximum surge level indicated in diagram 3.

The resultant sewage/effluent free area protects against the fouling of the orifice seals by solids or high viscous substances.

- 4. PRESSURIZED AIR/GAS RELEASE (PUMP OPERATING)**  
The volume of disentrained air/gas increases in the valve and displaces the sewage/effluent level to the lower, normal operating level (small orifice control float buoyancy level ) Any additional lowering of the sewage/effluent level, as would occur when more air/gas enters the valve, will result in the control float dropping away from the small orifice through which pressurized air/gas is then being discharged to atmosphere.

The control float will close the small orifice when sufficient air/gas has been released to restore the sewage/effluent level to the normal operating level.

The considerable sewage/effluent free are obviates the possibility of leaks that could otherwise be caused by solids entering the sealing areas.

### **\*Note:**

A relatively low flow discharge rate is required to lift the upper chamber float and ensure air release . The Upper Chamber Float will seat on the Middle Flange under vacuum conditions, effectively preventing air entry.

### COMPONENT DESCRIPTION & MATERIAL SPECIFICATION THREADED 2" & STUDED INLET - 3" TO 4"

**Type:**  
Series RGXv - Triple Orifice with "Anti-Surge"  
Mechanism

**End Connection:**  
Flange with Threaded NPT Male - 2" valves.  
Flange with Screwed Studs - 3" & 4" valves.

**Nominal Sizes:**

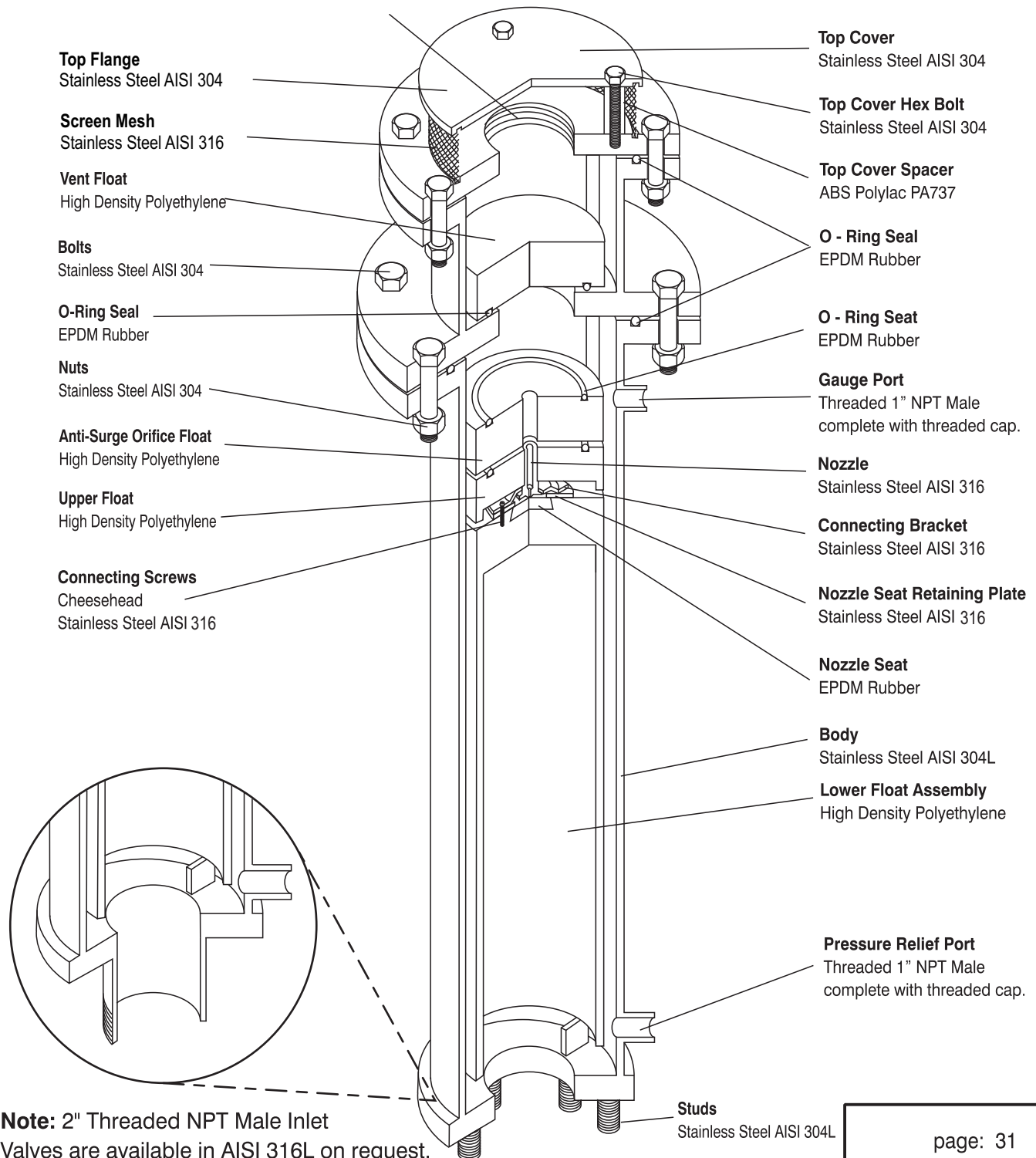
2"  
3"  
4"

**Model No's:**

RGXv 1021 \_\_\_\_\_ 145 psi  
RGXv 1031 \_\_\_\_\_ 145 psi

**Pressure Ratings:**

Threaded Outlet  
Female NPT



**Top Flange**  
Stainless Steel AISI 304

**Screen Mesh**  
Stainless Steel AISI 316

**Vent Float**  
High Density Polyethylene

**Bolts**  
Stainless Steel AISI 304

**O-Ring Seal**  
EPDM Rubber

**Nuts**  
Stainless Steel AISI 304

**Anti-Surge Orifice Float**  
High Density Polyethylene

**Upper Float**  
High Density Polyethylene

**Connecting Screws**  
Cheesehead  
Stainless Steel AISI 316

**Top Cover**  
Stainless Steel AISI 304

**Top Cover Hex Bolt**  
Stainless Steel AISI 304

**Top Cover Spacer**  
ABS Polyac PA737

**O - Ring Seal**  
EPDM Rubber

**O - Ring Seal**  
EPDM Rubber

**Gauge Port**  
Threaded 1" NPT Male  
complete with threaded cap.

**Nozzle**  
Stainless Steel AISI 316

**Connecting Bracket**  
Stainless Steel AISI 316

**Nozzle Seat Retaining Plate**  
Stainless Steel AISI 316

**Nozzle Seat**  
EPDM Rubber

**Body**  
Stainless Steel AISI 304L

**Lower Float Assembly**  
High Density Polyethylene

**Pressure Relief Port**  
Threaded 1" NPT Male  
complete with threaded cap.

**Studs**  
Stainless Steel AISI 304L

**Note:** 2" Threaded NPT Male Inlet  
Valves are available in AISI 316L on request.  
Information subject to change without prior notice

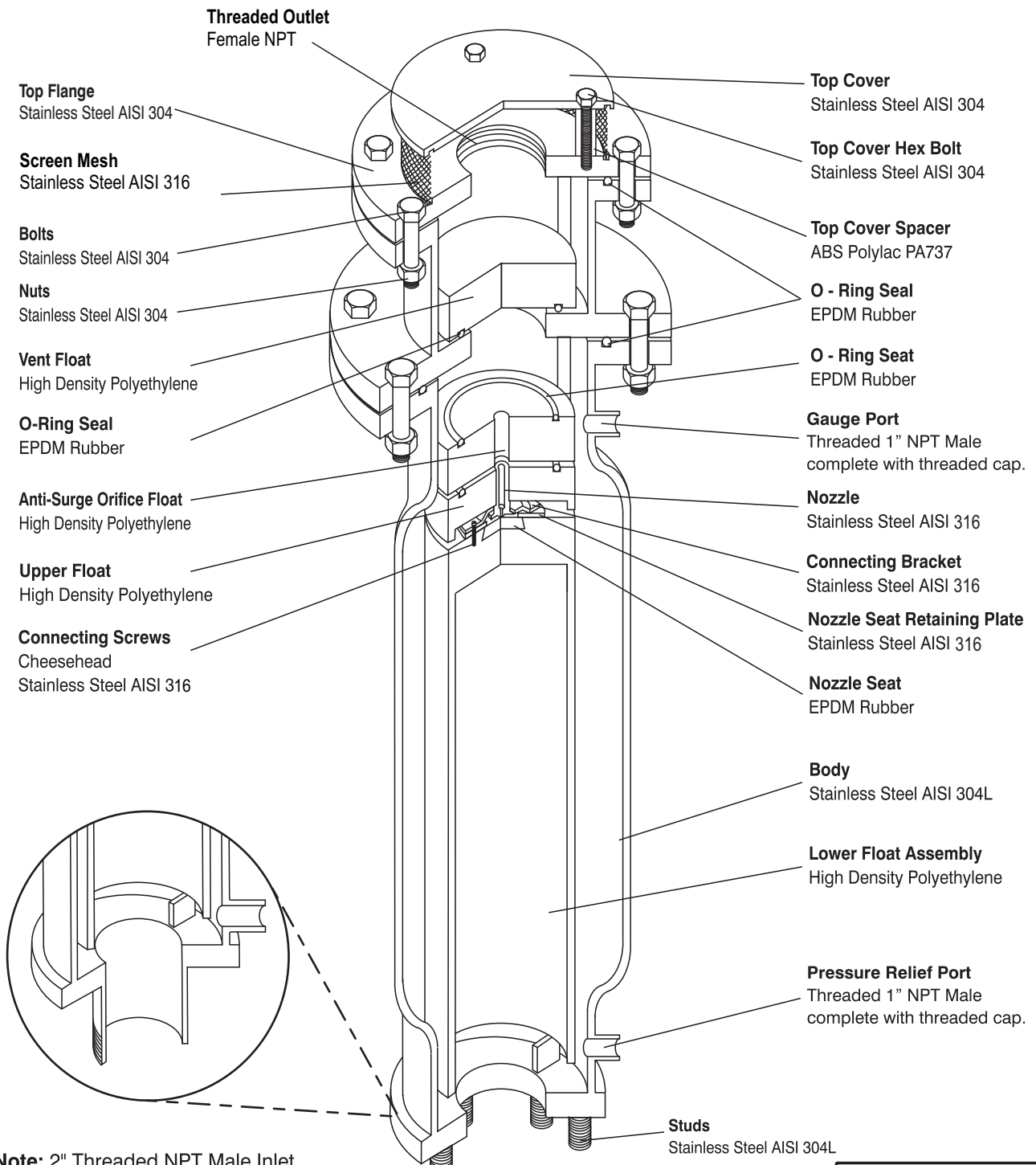
### COMPONENT DESCRIPTION & MATERIAL SPECIFICATION THREADED 2" & STUDED INLET - 3" TO 4" EXPANDED BODY

**Type:**  
Series RGXv - Triple Orifice with "Anti-Surge"  
Mechanism

**End Connection:**  
Flange with Threaded NPT Male - 2" valves.  
Flange with Screwed Studs - 3" & 4" valves.

**Nominal Sizes:**  
2"  
3"  
4"

**Model No's:**                      **Pressure Ratings:**  
RGXv 1621 \_\_\_\_\_ 232 psi  
RGXv 1631 \_\_\_\_\_ 232 psi



**Note:** 2" Threaded NPT Male Inlet  
Valves are available in AISI 316L on request.  
Information subject to change without prior notice

**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION**  
**STUDED INLET - 6" & 8"**

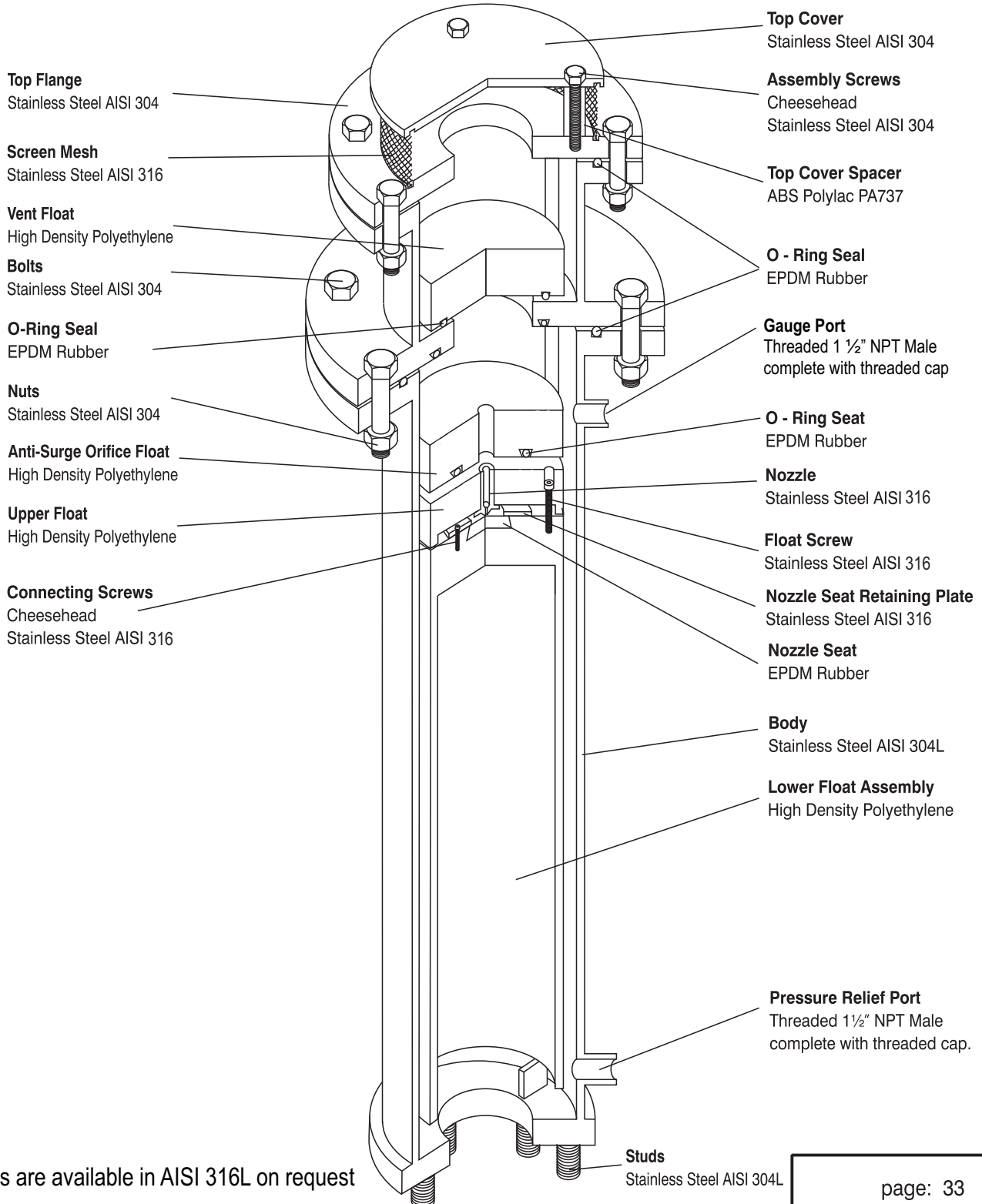
**Type:**  
Series RGXv - Triple Orifice with "Anti-Surge"  
Mechanism

**End Connection:**  
Flange with Screwed Studs - 6" & 8" valves.

**Nominal Sizes:**  
6"  
8"

**Model No's:** \_\_\_\_\_  
RGXv 1031 \_\_\_\_\_

**Pressure Ratings:**  
145 psi



Valves are available in AISI 316L on request

Information subject to change without prior notice

**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION  
STUDED INLET - 6" & 8" EXPANDED BODY**

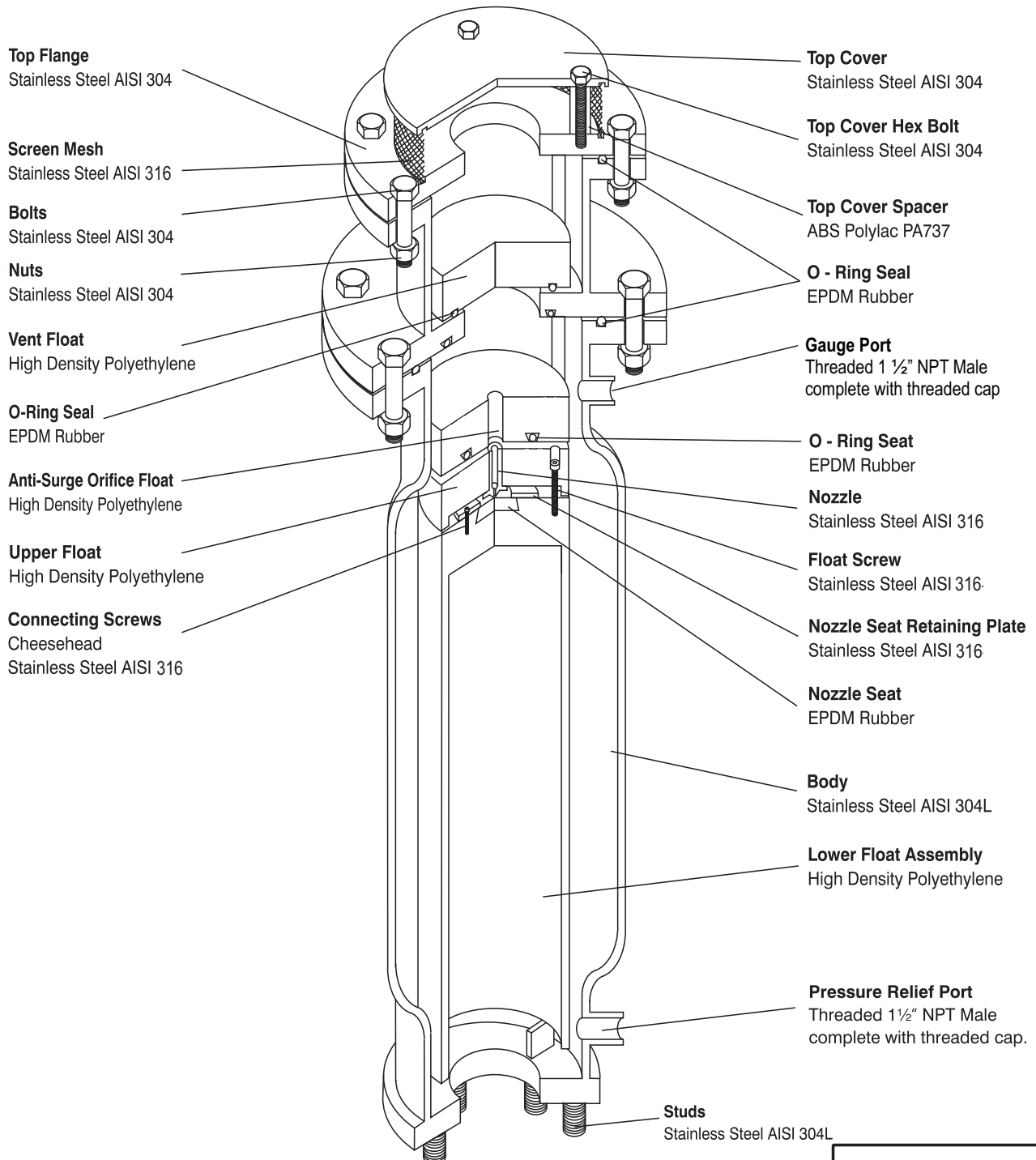
**Type:**  
Series RGXv - Triple Orifice with "Anti-Surge"  
Mechanism.

**End Connection:**  
Flange with Screwed Studs - 6" & 8" valves.

**Nominal Sizes:**  
6"  
8"

**Model No's:**  
RGXv 1631 \_\_\_\_\_

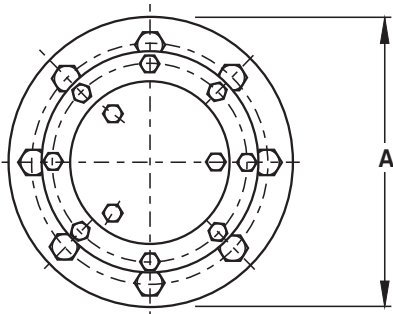
**Pressure Ratings:**  
232 psi



Valves are available in AISI 316L on request  
Information subject to change without prior notice

### GENERAL SPECIFICATIONS

#### THREADED 2" & STUDED INLET - 3" TO 8"



**Type:**

Triple Orifice for air/gas discharge but not air re-entry.

**End Connection:**

Flange with 2" Male NPT Threaded and Screwed Studs for Alignment to ANSI B16.5 Class 150 for 3" to 8".

**Nominal Sizes:**

2", 3", 4", 6" & 8"

**Model No's:**

RGXv 1021 \_\_\_\_\_ 145 psi  
 RGXv 1031 \_\_\_\_\_ 145 psi

**Pressure Ratings - psi:**

**Operating Pressure Range - psi:**

	Min		Max.
145psi _____	7.2	_____	145

**Function:**

- i) High volume air/gas discharge - pipeline filling.
- ii) Pressurized air/gas discharge - pipeline filled.
- iii) Surge dampening - high velocity air/gas discharge, liquid column separation & liquid oscillation.

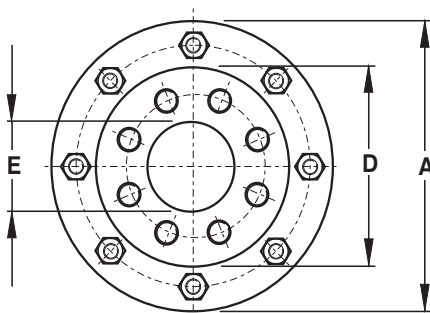
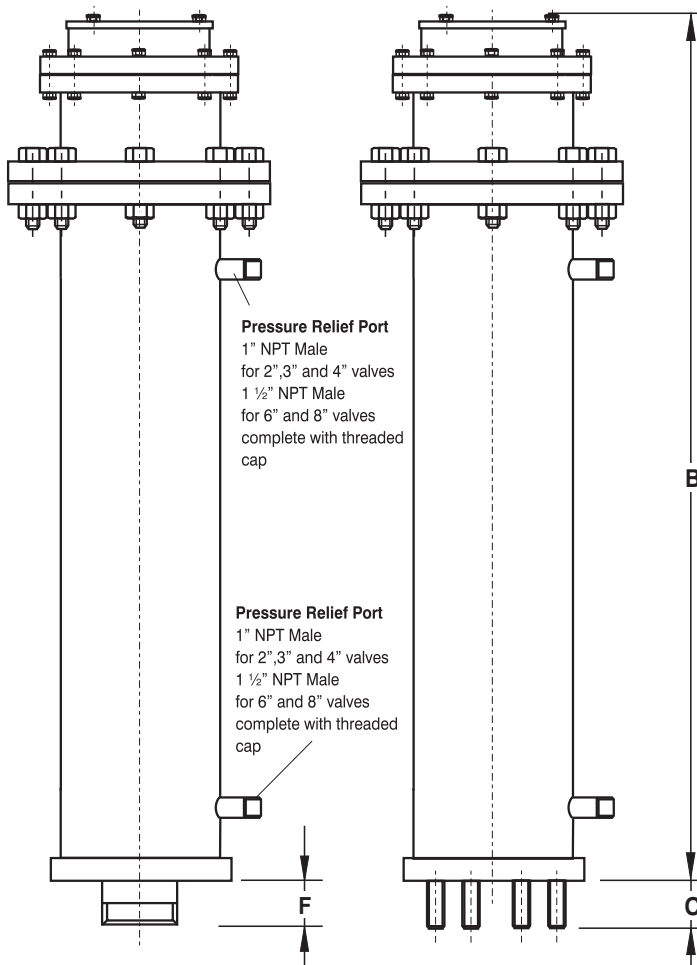
**Valve Selection:-** see pages 11 & 12

**Materials of Construction:-** see pages 31 & 33

**Installation:-** see page 3

**Standard Factory Tests:**

- i) Hydrostatic test - 1.5 x max. rated working pressure
- ii) Low head leak test - 7,2 psi
- iii) Small orifice function test at max. rated working pressure (minimum 1 valve in 10).



### OVERALL DIMENSIONS & WEIGHTS

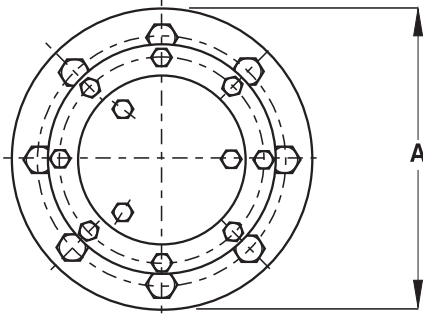
DN	Model No.	A	B	C	D	E	F	Weight lbs
2	050 RGXv 1021	8 2/3	34	N/A	5	2	1 2/3	49.6
3	080 RGXv 1031	11 1/4	34 1/3	2 1/8	7 7/8	3	N/A	94.8
4	100 RGXv 1031	11 1/4	34 1/3	2 1/8	8 2/3	4	N/A	93.7
6	150 RGXv 1031	15 9/16	48 2/10	2 1/8	11	6	N/A	212.7
8	200 RGXv 1031	17 1/2	48 2/10	2 1/8	13 9/16	8	N/A	259

Note: 2" valves have 2"NPT male inlet connections as standard.

Information subject to change without prior notice

### GENERAL SPECIFICATIONS

#### THREADED 2" & STUDDED INLET - 3" TO 8" EXPANDED BODY



**Type:**

Triple Orifice with *Vent* mechanism for air/gas discharge but not air re-entry.

**End Connection:**

Flange with 2" Male NPT Threaded and Screwed Studs for Alignment to ANSI B16.5 Class 150 for 3" to 8".

**Nominal Sizes:**

2", 3", 4", 6" & 8"

**Model No's:**

RGXv 1621 \_\_\_\_\_ 232 psi  
 RGXv 1631 \_\_\_\_\_ 232 psi

**Pressure Ratings - psi:**

**Operating Pressure Range - psi:**

232 psi \_\_\_\_\_ Min \_\_\_\_\_ Max.  
 7.2 \_\_\_\_\_ 232

**Function:**

- i) High volume air/gas discharge - pipeline filling
- ii) Pressurized air/gas discharge - pipeline filled.
- iii) Surge dampening - high velocity air/gas discharge, Liquid column separation & liquid oscillation.

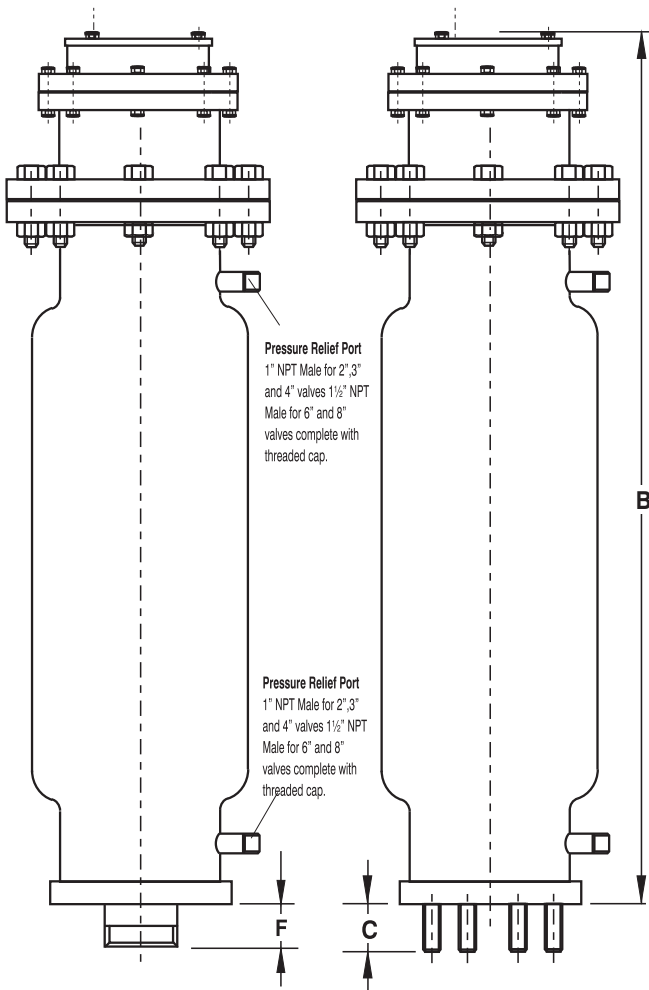
**Valve Selection:-** see pages 11 & 12

**Materials of Construction:-** see pages 32 & 34

**Installation:-** see page 3

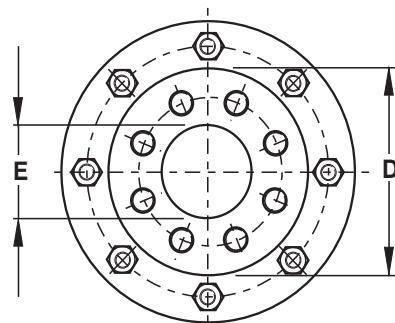
**Standard Factory Tests:**

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



### OVERALL DIMENSIONS & WEIGHTS

DN	Model No.	A	B	C	D	E	F	Weight Lbs
2	050 RGXv 1621	8 2/3	34	N/A	5	2	1 2/3	56.2
3	080 RGXv 1631	11 1/4	34 1/3	2 1/8	7 7/8	3	N/A	98
4	100 RGXv 1631	11 1/4	34 1/3	2 1/8	8 2/3	4	N/A	96.9
6	150 RGXv 1631	15 9/16	48 2/10	2 1/8	11	6	N/A	218.7
8	200 RGXv 1631	17 1/2	48 2/10	2 1/8	13 6/16	8	N/A	264.5



Note: 2" valves have 2"NPT male inlet connections as standard.

Information subject to change without prior notice

# PURCHASE SPECIFICATION

**VENT -O- MAT MODEL NO.**

Page 35 - Series RGXv - 2" to 8".

Page 36 - Series RGXv - 2" to 8" (Expanded Body)

**CONSTRUCTION & DESIGN**

The Sewage Air Release & Vacuum Break Valve shall consist of a compact tubular all stainless steel fabricated body, hollow direct acting float and solid large orifice float in H.D.P.E. - stainless steel nozzle and woven dirt inhibitor screen, EPDM rubber seals and seat.

The valve shall have an integral "Anti - Surge" Orifice mechanism which shall operate automatically to limit transient pressure rise or shock induced by closure to less than 1.5 x valve rated working pressure.

The intake orifice area shall be equal to the nominal size of the valve i.e., a 6" valve shall have a 6" intake orifice. Large orifice sealing shall be effected by the flat face of the surge control float seating against a EPDM rubber 'O' ring housed in a dovetail groove circumferentially surrounding the orifice.

Discharge of pressurized air shall be controlled by the seating & unseating of a small orifice nozzle on a natural rubber seal affixed into the control float. The nozzle shall have a flat seating land surrounding the orifice so that damage to the rubber seal is prevented.

The valve construction shall be proportioned with regard to material strength characteristics, so that deformation, leaking or damage of any kind does not occur by submission to twice the designed working pressure.

Connection to the valve inlet shall be facilitated by flanged ends conforming to ANSI B16.5 Class 150 and NPT where necessary .

Flanged ends shall be supplied with the requisite number of stainless steel screwed studs inserted for alignment to the specified standard. **Nuts and washers shall be included.**

**OPERATION**

1. Prior to the ingress of liquid into the valve chamber, as when the pipeline is being filled, valves shall vent through the large orifice when sewage/effluent approach velocities are relative to a transient pressure rise, on valve closure, of  $< 1.5 \times$  valve rated pressure.

At higher sewage/effluent approach velocities, which have a potential to induce transient pressure rises  $> 1.5 \times$  valve rated pressure on valve closure, the valve shall automatically discharge air/gas through the "Anti - Surge" Orifice and reduce sewage/effluent approach velocity, so that on closure a maximum transient pressure rise of  $< 1.5 \times$  valve rated pressure is realised.

2. Valves shall not exhibit leaks or weeping of liquid past the large orifice seal at operating pressures of 7.2 psi to twice rated working pressure.

3. Valves shall prevent air from entering the pipeline by the seating of the upper chamber float in the upper chamber on the seat in the middle flange.



### ORDERING GUIDE

050 RGX v 10 2 1 S4

**VALVE SIZE:**

2"	-	050
3"	-	080
4"	-	100
6"	-	150
8"	-	200

**VALVE SERIES**

**SPECIAL APPLICATION:**

BIAS AIR IN  b  
 BIAS AIR OUT  v

**VALVE PRESSURE RATING:**

145 PSI	10
232 PSI	16

**BODY TYPE:**

FULL 304 S/S CONSTRUCTION	S4
FULL 316 S/S CONSTRUCTION	S6

**VALVE TYPE:**

DOUBLE ACTING  1

**VALVE END CONNECTION:**

THREADED - NPT MALE	2
STUDED FLANGE - ANSI 150#	3
TROPHY FLANGED - ANSI 150#	4

**Note:**

- 1. 10" and 12" valves are available on request.

**All air release valves supplied shall be subjected to the following testing procedures in the order laid down:**

- A) A high pressure strength and leak test whereby the valve is filled with water and pressurized to 1.5 x the rated working pressure which shall be held for a period of 2 minutes. Any leaking, weeping or sweating shall be reason for rejection.
- B) A low head leak test whereby the valve is filled with water and pressurized to a maximum of 7.2 psi using a visible water column connected to the test rig. The valve shall be rejected if leak tightness is not maintained for 2 minutes
- C) Every tenth air release valve of the same size and pressure rating must be subjected to a small orifice function test - "DROP TEST" - whereby the valve is filled with water, pressurized to above rated working pressure and isolated from the test rig by closure of an isolating valve. A chamber in the test rig immediately prior to the isolating valve must be filled with compressed air at a pressure equal to that being maintained in the air release valve. The isolating valve is then opened so as to allow the air to rise in the air release valve without the pressure dropping lower than 29 - 44 psi above rated working pressure of the air release valve. The "DROP TEST" is then carried out by slowly bleeding off the pressure through a suitable cock until rated working pressure is reached and the float drops away from the orifice to allow discharge. Failure of the air release valve to function in the manner described will be reason for rejection.

On request the manufacturer shall provide batch certificates of test compliance which shall be cross referenced to serial numbers indelibly marked onto the identity label of each valve.

**IMPORTANT NOTE:** It is impossible to inject air into an incompressible liquid, air injection can only be achieved if the liquid can be displaced which implies that the pressure in the test rig must be reduced to atmospheric, and absolutely nothing is proven by discharge through the small orifice of the air release valve at atmospheric pressure. "DROP TESTING" in this manner is not acceptable.

**Copy and Complete the Form Below For Any Additional Information and E-mail, Fax or Mail to:**

Vent-O-Mat® USA  
A Division of RF Valves, Inc.  
Member of the DFC Group of Companies  
1342 Charwood Rd., Suite A • Hanover, MD 21076 • USA  
Phone: +1-410-850-4404 • Fax: +1-410-850-4464

E-mail: [ventomat@rfvalve.com](mailto:ventomat@rfvalve.com)

Or contact us via our Website  
[www.ventomat.us](http://www.ventomat.us)

**Company Name:** .....

**Postal Address:** .....

**Postal Code:** ..... **Country:** .....

**Tel:** ..... **Fax:** ..... **E-mail** .....

**Contact Name:** ..... **Title:** .....

**Comments:**

.....  
.....

**Products you are interested in:****VENT-O-MAT® Series RBXc Air Release & Vacuum Break Valves**

Compact Single chamber design With Integral “Anti-Shock” surge dampening mechanism in an economical cast Ductile iron construction

**VENT-O-MAT® Series RBX Air Release & Vacuum Break Valves**

Compact Stainless Steel single chamber design with integral “Anti-Shock” surge dampening Mechanism

**VENT-O-MAT® Series RC Air Release and Vacuum Break Valves**

Cast air valve for irrigation and small reticulation systems

**VENT-O-MAT® Series RPS Air Release & Vacuum Break Valves**

Glass reinforced polypropylene CATT air valve for industrial, irrigation and small reticulation Systems

# VENT-O-MAT<sup>®</sup>

## RF Valves, Inc.

(Hereinafter referred to as Seller)

### STANDARD TERMS AND CONDITIONS

**1. CONTROLLING PROVISIONS:** These terms and conditions shall control with respect to any purchase order or sale of Seller's products. No waiver, alteration or modification of these terms and conditions whether on Buyer's purchase order or otherwise shall be valid unless waiver, alteration or modification is specifically accepted in writing and signed by an authorized representative of Seller.

**2. DELIVERY:** Seller will make every effort to complete delivery of products as indicated on Seller's acceptance of an order, but Seller assumes no responsibility or liability, and will accept no back charge for loss or damage due to delay or inability to deliver caused by acts of God, war, labor difficulties, accident, delays of carriers, by contractors or suppliers, inability to obtain materials, shortages of fuel and energy or any other causes of any kind whatever beyond the control of Seller. Seller may terminate any contract of sale of its products without liability of any nature, by written notice to Buyer, in the event that the delay in delivery or performance resulting from any of the aforesaid causes shall continue for a period of sixty (60) days. Under no circumstances shall Seller be liable for any special or consequential damages or for loss, damage or expense (whether or not based on negligence) directly or indirectly arising from delays or failure to give notice of delay.

**3. WARRANTY:** Seller warrants RF Pinch and RF-SKG for one year and Vent-O-Mat for limited 10 years from the date of shipment Seller's manufactured products to the extent that Seller will replace those having defects in material or workmanship when used for the purpose and in the manner which Seller recommends. Vent-O-Mat 10 year limited warranty applies to internal parts only. If Seller's examination shall disclose to its satisfaction that the products are defective, and an adjustment is required, the amount of such adjustment shall not exceed the net sales price of the defective products only and no allowance will be made for labor or expense of repairing or replacing defective products or workmanship or damage resulting from same. Seller does not guarantee resistance to corrosion, erosion, abrasion, or other sources of failure, nor does Seller guarantee a minimum length of service, or that the product shall be fit for any particular service. Seller warrants the products which it sells of other manufacturers to the extent of the warranties of their respective makers. Where engineering design or fabrication work is supplied, Buyer's acceptance of Seller's design or of delivery of work shall relieve Seller of all further obligation, other than as expressed in Seller's product warranty. THIS IS SELLER'S SOLE WARRANTY. SELLER MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE WHICH EXCEED SELLER'S AFORESTATED OBLIGATION ARE HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM THIS WARRANTY. Seller neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of its engineering designs or products. This warranty shall not apply to any products or parts of products which (a) have been repaired or altered outside of Seller's factory, in any manner; or (b) have been subjected to misuse, negligence or accidents; or (c) have been used in a manner contrary to Seller's instructions or recommendations. Seller shall not be responsible for design errors due to inaccurate or incomplete information supplied on Valve Data Sheet(s) by Buyer or its representatives. The laws of the State of Maryland shall govern, apply and construe all questions and interpretations hereunder.

**4. SELLER'S LIABILITY:** Seller will not be liable for any loss, damage, cost of repairs, incidental or consequential damages of any kind, whether based upon warranty (except for the obligation accepted by Seller under "Warranty", above), contract or negligence arising in connection with the design, manufacture, sale, use or repair of the products or of engineering designs supplied to Buyer.

**5. STORAGE:** Valves shall be stored indoors free from job site dirt, mud, and temperature changes. If indoor storage is not possible, the valve must be stored above possible water or snow level and remain covered in the original shipping container. Failure to store valves in this fashion or to follow storage requirements for electrical components or other auxiliary equipment will void their warranty.

**RETURNS:** Seller cannot accept return of any products unless it has been issued a Returned Goods Authorization (RGA) number and form from RF Valves' Customer Service Dept. at (410) 850-4404 or email to Support@rfvalve.com.

All credits for returned goods are subject to the following: (a) All material returned must be clearly marked with the RGA#, and on its arrival at Seller's plant, be found to be in first-class condition; if not, cost of putting in salable condition will be deducted from credit memoranda; (b) a minimum \$50 or 5% handling charge will be made from all credit memoranda issued for material returned; (c) Transportation charges, if not prepaid, will be deducted from credit memoranda.

Credits, subject to above, apply only within 90 days after shipment:

i) 75% – standard manual/air release valve(s), in original packaging

ii) 50% – standard automated valve(s), in original packaging

iii) 75% – standard accessories unused

iv) Special purpose valve(s) or accessories designed to customer specifications returned for non-warranty reasons – credit determined on a case-by-case basis subject to inspection.

**6. ORDER CANCELLATIONS or CHANGE ORDERS:** Cancellations subject to the following charges as a percentage of total order amount; **10%** order entered; **30%** released for manufacture; **50%** assembly in process or awaiting shipment, unless product is a non-standard, special purpose valve, in which case **100%** or as agreed upon in writing case-by-case. Change Orders – Changing standard accessories, manufacturer's re-stocking fee, plus cost of new item(s). Change of valve structure or design from standard valve design or following release to manufacture, **25%** of order; **50%** of order when assembly in process or awaiting shipment, unless product a non-standard, special purpose valve, in which cost agreed upon in writing on case-by-case basis.

**7. SHIPMENTS:** All products sent out will be carefully examined, counted and packed. The cost of any special packing or special handling caused by Buyer's requirements or requests shall be added to the amount of the order. No claim for shortages will be allowed unless made in writing within ten (10) days of receipt of shipment. Claims for products damaged or lost in transit should be made on the carrier, as Seller's responsibility ceases, and title passes, on delivery to the carrier.

**8. SPECIAL PRODUCTS:** Orders covering special or non-standard products are not subject to cancellation except on such terms as Seller may specify on application.

**9. PRICES AND DESIGNS:** Prices and designs are subject to change without notice. All prices are F.O.B. Point of Shipment, unless otherwise stated. In the absence of a special agreement, Buyer agrees to pay 1.5% monthly interest on all past due invoices. If Seller shall have any doubt at any time as to Buyer's financial responsibility, Seller may decline to make deliveries except of cash or satisfactory security.

**10. TAXES:** The amount of any sales, excise, or other taxes, if any, applicable to the products covered by this order, shall be added to the purchase price and shall be paid by Buyer unless Buyer provides Seller with an exemption certificate acceptable to the taxing authorities.

**11. MINIMUM ORDER:** \$500.00 plus transportation on complete valve assemblies. \$50 plus transportation on replacement spare parts.

**12. TERMS:** Cash, net 30 days unless otherwise specified

**WARNING** - RF Valves, Inc. VALVES ARE DESIGNED AND MANUFACTURED USING GOOD WORKMANSHIP AND MATERIALS, AND MEET INDUSTRY STANDARDS. THESE VALVES ARE AVAILABLE WITH COMPONENTS OF VARIOUS MATERIALS, AND THEY SHOULD BE USED ONLY IN SERVICES RECOMMENDED BY A COMPANY VALVE ENGINEER. MISAPPLICATION OF THE PRODUCT MAY RESULT IN INJURIES (INCLUDING DEATH) OR PROPERTY DAMAGE. A SELECTION OF VALVE COMPONENTS OF THE PROPER MATERIAL CONSISTENT WITH THE PARTICULAR PERFORMANCE REQUIREMENT IS IMPORTANT FOR PROPER APPLICATION. IF THE VALVE EXHIBITS ANY INDICATION OF LEAKAGE, DO NOT OPERATE. ISOLATE VALVE AND EITHER REPAIR OR REPLACE

Revised: June 1, 2014





**Vent-O-Mat ® USA -Div of RF Valves, Inc.**

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**E-mail: [ventomat@rfvalve.com](mailto:ventomat@rfvalve.com)**

**web: [www.ventomat.us](http://www.ventomat.us)**



*Revision Date August 2014 Catalogue RGX0005*