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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 obstructed 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 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 - for this reason NO FLUSHING CONNECTIONS ARE NECESSARY.

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 - for this reason NO FLUSHING CONNECTIONS ARE NECESSARY.

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 - for this reason NO FLUSHING CONNECTIONS ARE NECESSARY.

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

RECOMMENDED INSTALLATION ARRANGEMENTS

TYPE 1

TYPE 2

MANHOLE

AIR VENT (AIR OUT)
DIAMETER EQUAL
OR GREATER THAN
NB OF AIR VALVE

AIR VALVE
PIPING EXTENDED
BY OTHERS

AIR VALVE
ISOLATOR
BY OTHERS

AIR VENT (AIR IN)
DIAMETER EQUAL
OR GREATER THAN
NB OF AIR VALVE

VALVE CHAMBER

AIR/ GAS

SEWAGE/ EFFLUENT

TYPICAL VALVE CHAMBER

h = D MIN.
d = 0.5 DMIN.

LOWER SUMP TO ALLOW DRAINAGE BY SUMP PUMP

information subject to change without prior notice

page: 3
revision date: Oct 2006
AVAILABLE DISCHARGE CONNECTIONS

50 (2") TO 200 (8")
250 (10") & 300 (12") VALVES AVAILABLE ON REQUEST

STANDARDS

Standard Discharge Connection. Screen Mesh On Outlet.
DN50 (2"), DN80 (3"), DN100 (4"),
DN150 (6") & DN200 (8")

Screwed BSP/NPT Inlet Connection.
DN50 (2") Valves Only.

Studded Inlet Connection.
DN80 (3"), DN100 (4"),
DN150 (6") & DN200 (8") Valves Only.

SPECIAL ORDERS

Swivel Flange Outlet Connection.*

Flanged Trophy Inlet Connection for
DN250 (10") & DN300 (12") Valves Only

*NOTE:
Discharge Connections Are Equal To Valve Pressure Rating

information subject to change without prior notice

page: 4
revision date: Oct 2006
**Series RGX**

**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION**

**THREADED 50 (2") & STUDDED INLET - 80 (3") TO 100 (4")**

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

**Nominal Sizes:**
- DN50 (2")
- DN80 (3")
- DN100 (4")

**End Connection:**
Flange with Threaded BSP/NPT Male - 50 (2") valves.
Flange with Screwed Studs - 80 (3") & 100 (4") valves.

**Model No:**
- RGX 1011/1021
- RGX 1001/1031

**Pressure Ratings:**
- PN10 (145 psi)

**Top Flange**
Stainless Steel AISI 304

**Screen Mesh**
Stainless Steel AISI 304

**Bolts**
Stainless Steel AISI 304

**Nuts**
Stainless Steel AISI 304

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

**Upper Float**
High Density Polyethylene

**Connecting Screws**
Cheesehead
Stainless Steel AISI 304

**Top Cover**
Stainless Steel AISI 304

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

**Top Cover Spacer**
ABS Polyiac PA737

**O - Ring Seal**
EPDM Rubber

**O - Ring Seat**
EPDM Rubber

**Connecting Bracket**
Stainless Steel AISI 304

**Nozzle Seat Retaining Plate**
Stainless Steel AISI 304

**Nozzle**
Stainless Steel AISI 304

**Nozzle Seat**
EPDM Rubber

**Body**
Stainless Steel AISI 304L

**Lower Float Assembly**
High Density Polyethylene

**Studs**
Stainless Steel AISI 304L

**Note:** 50 (2") Threaded BSP/NPT Male Inlet Valves are available in AISI 316L on request.

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Information subject to change without prior notice

Page: 5
Revision Date: Oct 2006
Series RGX

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION
THREADED 50 (2") & STUDDED INLET - 80 (3") TO 100 (4") EXPANDED BODY

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

**Nominal Sizes:**
- DN50 (2")
- DN80 (3")
- DN100 (4")

**End Connection:**
Flange with Threaded BSP/NPT Male 50 (2") valves.
Flange with Screwed Studs 80 (3") & 100 (4") valves.

**Model No's:**
- RGX 1611/1621 PN16 (232 psi)
- RGX 2511/2521 PN25 (363 psi)
- RGX 1601/1631 PN16 (232 psi)
- RGX 2501/2531 PN25 (363 psi)

**Pressure Ratings:**
- PN16 (232 psi)
- PN25 (363 psi)

---

**Note:** 50 (2") Threaded BSP/NPT Male Inlet Valves are available in AISI 316L on request.

Information subject to change without prior notice

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Revision Date: Oct 2006
**Series RGX**

**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION**

**STUDDED INLET - 150 (6") & 200 (8")**

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

**End Connection:**
Flange with Screwed Studs - 150 (6") & 200 (8") valves.

**Nominal Size:**
- DN150 (6")
- DN200 (8")

**Model No.:**
RGX 1001/1031

**Pressure Rating:**
PN10 (145 psi)

- **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 Seat**
  EPDM Rubber
- **Float Screw**
  Stainless Steel AISI 304
- **Nozzle Seat Retaining Plate**
  Stainless Steel AISI 304
- **Nozzle**
  Stainless Steel AISI 304
- **Nozzle Seat**
  EPDM Rubber
- **Body**
  Stainless Steel AISI 304L
- **Lower Float Assembly**
  High Density Polyethylene
- **Studs**
  Stainless Steel AISI 304L

**Screen Mesh**
Stainless Steel AISI 304

**Bolts**
Stainless Steel AISI 304

**Nuts**
Stainless Steel AISI 304

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

**Upper Float**
High Density Polyethylene

**Connecting Screws**
Cheesehead Stainless Steel AISI 304

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

Information subject to change without prior notice

Page: 7
Revision date: Oct 2006
**Series RGX**

**COMPONENT DESCRIPTION & MATERIAL SPECIFICATION**

**STUDDED INLET - 150 (6") & 200 (8") EXPANDED BODY**

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

**End Connection:**
Flange with Screwed Studs - 150 (6") & 200 (8") valves.

**Nominal Sizes:**
- 150 (6")
- 200 (8")

**Model No’s:**
- RGX 1601/1631
- RGX 2501/2531

**Pressure Ratings:**
- PN16 (232 psi)
- PN25 (363 psi)

**Diagram:**
- Top Flange: Stainless Steel AISI 304
- Screen Mesh: Stainless Steel AISI 304
- Bolts: Stainless Steel AISI 304
- Nuts: Stainless Steel AISI 304
- Anti-Surge Orifice Float: High Density Polyethylene
- Upper Float: High Density Polyethylene
- Connecting Screws: Cheesehead Stainless Steel AISI 304

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

Information subject to change without prior notice.

**page:** 8
**revision date:** Oct 2006
Series RGX

GENERAL SPECIFICATIONS
THREADED 50 (2") & STUDDED INLET - 80 (3") TO 200 (8")

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

End Connection:
Flange with DN50 (2") Male BSP/NPT Threaded and Screwed Studs for Alignment to BS4504, SABS 1123 and ANSI B16.5 Class 150 for DN80 (3") to DN200 (8").

Nominal Sizes:
DN50 (2"), DN80 (3"), DN100 (4"), DN150 (6") & DN200 (8")

Model No's:
RGX 1011/1021, PN10 (145 psi)
RGX 1001/1031, PN10 (145 psi)

Operating Pressure Range - bar (psi):
Min 0.5 (7.2) Max 10 (145)

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 - 0.5 bar (7.2 psi)
iii) Small orifice function test at max. rated working pressure (minimum 1 valve in 10).

OVERALL DIMENSIONS & WEIGHTS

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<th>Model No.</th>
<th>Model No.</th>
<th>A mm</th>
<th>B mm</th>
<th>C mm</th>
<th>D mm</th>
<th>E mm</th>
<th>F mm</th>
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Note: DN50 (2") valves have DN50 (2") BSP/NPT male inlet connections as standard.
information subject to change without prior notice

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revision date: Oct 2006
Series RGX

GENERAL SPECIFICATIONS
THREADED 50 (2") & FLANGED - 50 (2") TO 200 (8") EXPANDED BODY

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

End Connection:
Flange with DN50 (2") Male BSP/NPT Threaded and Screwed Studs for Alignment to BS4504, SABS1123 and ANSI B16.1 Class 150 & Class 300 for DN80 (3") to DN200 (8").

Nominal Sizes:
DN50 (2"), DN80 (3"), DN100 (4"), DN150 (6") & DN200 (8")

Model No's:
RGX 1611/1631 PN16 (232 psi) ANSI #125
RGX 1601/1631 PN16 (232 psi) ANSI #125
RGX 2501/2531 PN25 (363 psi) ANSI #250

Operating Pressure Range - bar (psi):
Min Max
PN16 (232 psi) ANSI #125 0.5 (7.2) 16 (232)
PN25 (363 psi) ANSI #250 0.5 (7.2) 16 (363)

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 - 0.5 bar (7.2 psi)
iii) Small orifice function test at max. rated working pressure (minimum 1 valve in 10).

OVERALL DIMENSIONS & WEIGHTS

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<th>Model No.</th>
<th>Model No.</th>
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Note: DN50 (2") valves have DN50 (2") BSP/NPT male inlet connections as standard. Information subject to change without prior notice.
### Conversion Table: l/min. to m/sec. of Pipeline Velocity

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### VALVE SELECTION GRAPH

- **300 (12")**
- **250 (10")**
- **200 (8")**
- **150 (6")**
- **100 (4")**

**Pipe Dia. in mm**

**Pipe Flow in m/ls**

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**information subject to change without prior notice**

**page: 11**

**revision date: Oct 2006**
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 0.34 bar (5 psi) below atmospheric. It is not good practice to go below 0.69 bar (10 psi) absolute (0.303 bar (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 m/s either for scouring, pipe rupture or column separation for a particular pipeline section.
2. Move vertically on the graph from the m/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 -0.34 bar (5 psi) and the lower portion -0.1 bar (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 400mm (16") pipeline draining at 377 l/sec which equates to 3 m/sec (10 ft/s) what valve size should be selected?

From the 3 m/sec (10 ft/s) point, move vertically until the ø 400mm (16") pipe size horizontal line is intersected. This places the intersection point squarely in the centre of the operating band of a DN80 (3") Vent-O-Mat RGX valve. But, if for example, the drainage rate is 503 l/sec which equates to 4 m/sec (13.2 ft/s), the valve would be operating on its limit and it may be prudent to change to a DN100 (4") Vent-O-Mat RGX.

VALVE POSITIONING

1. ON APEX POINTS (relative to hydraulic gradient).
2. 5 METERS (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 600 meters (1/3 of a mile) maximum.
5. LONG ASCENDING SECTIONS - every 600 meters (1/3 of a mile) maximum.
6. LONG DESCENDING SECTIONS - every 600 meters (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.
**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.
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 FLOWMASTER, TRANSAM and SURGE 2000.

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!
Series RGX

SMALL ORIFICE DISCHARGE PERFORMANCE

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

Model No's:
RGX 1001/1011/1021/1031
RGX 1601/1611/1621/1631
RGX 2501/2511/2521/2531

~ 2mm (0.07") small orifice - DN50 (2"), DN80 (3"), Dn100 (4") Valves
~ 5mm (0.20") small orifice - DN150 (6") Valves
~ 6mm (0.24") small orifice - DN200 (8") Valves

FOR HIGHER ∆p OR DISCHARGE RATES CONSULT MANUFACTURER

Q (nl/s)

Q (scf/min.)

∆P (bar)

Q = Normal Litres per second (Free Air)
@ 1.01325 bar Abs. and 20 deg. C

Q = Standard Cubic Feet per minute (Free Air)
@ 14.7 psi Abs. 68 deg. F

CONVERSION EQUIVALENTS

1 l/sec. = 2.1189 scf/min.
1 l bar = 14.5 psi
1 scf/min = 0.472 l/sec.
1 psi = 0.069 bar

information subject to change without prior notice
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 200mm (8") valve has a 200mm (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*
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 150mm (6") valve shall have a 150mm (6") intake orifice. Large orifice sealing shall be effected by the flat face of the 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 PN10, 16 or 25 ratings of BS4504 or SABS 1123 Standards or ANSI B16.1 Class 125 & Class 250 and ANSI B16.5 Class 150 or Class 300 Standards. AS 4087 Fig. B7 - B9, AS 2129 Table E/F. 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 excluded.

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 0,5 bar (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. 0,5 bar (7.2 psi) to 10 bar (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.
## Series RGX

**ORDERING GUIDE**

<table>
<thead>
<tr>
<th>VALVE SIZE:</th>
<th>VALVE TYPE:</th>
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<tbody>
<tr>
<td>DN50 (2&quot;) - 050</td>
<td>DOUBLE ACTING [1]</td>
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<td>DN80 (3&quot;) - 080</td>
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<td>DN100 (4&quot;) - 100</td>
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<td>DN150 (6&quot;) - 150</td>
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<td>DN200 (8&quot;) - 200</td>
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**VALVE END CONNECTION:**
- STUDDED FLANGED - BS4504 or SABS 1123
- THREADED - BSP MALE
- THREADED - NPT MALE
- STUDDED FLANGED - ANSI B16.5

**Note:**
1. DN250 (10") and DN300 (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 0.5 bar (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 2 - 3 bar (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.

---

Note: DN250 (10") and DN300 (12") valves are available on request.
Series RGXb

OPERATION

1. VACUUM RELIEF (AIR INTAKE)
   PIPELINE DRAINING

2. VENTING
   (PUMP START UP)

3. PIPELINE FULLY CHARGED

4. PRESSURIZED AIR/GAS RELEASE
   PUMP OPERATING

"Anti - Surge" Orifice

"Anti - Surge" Float

Maximum Surge Level

Normal Operating Level
(Small Orifice Control Float Buoyancy Level)
10 bar (145 psi)
Working Pressure

information subject to change without prior notice
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 is 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:

- Provides effective release of air/gas in the vertical riser upon pump startup.
- Dampens surge pressures upon startup.
- Provides 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, for this reason NO FLUSHING CONNECTIONS ARE NECESSARY.

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 - for this reason NO FLUSHING CONNECTIONS ARE NECESSARY.

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 are obviates the possibility of leaks that could otherwise be caused by solids entering the sealing areas - for this reason NO FLUSHING CONNECTIONS ARE NECESSARY.

*Note:
A differential pressure of less than 0.05 bar (0.7 psi) across the large orifice is required to open the valve fully under vacuum conditions.
VENT-O-MAT®

Series RGXb

RECOMMENDED INSTALLATION ARRANGEMENTS

VERTICAL TURBINE PUMP APPLICATION

- Vent-O-Mat RGXb Air Valve
- Isolator
- Riser
- Check Valve

For Recommended Accumulator Dimensions
See Page 3

SUBMERSIBLE/DEEP WELL APPLICATION

- Vent-O-Mat RGXb Air Valve
- Isolator
- Riser
- Check Valve

For Recommended Accumulator Dimensions
See Page 3

Vertical Riser
Series RGXb

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION

THREADED 50 (2") & STUDDED INLET - 80 (3") TO 100 (4")

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

End Connection:
Flange with Threaded BSP/NPT Male - 50 (2") valves.
Flange with Screwed Studs - 80 (3") & 100 (4") valves.

Nominal Sizes:
DN50 (2")
DN80 (3")
DN100 (4")

Model No's:
RGXb 1011/1021
RGXb 1001/1031

Pressure Ratings:
PN10 (145 psi)

Locating Disk
Stainless Steel AISI 304

Top Flange
Stainless Steel AISI 304

Screen Mesh
Stainless Steel AISI 304

Bolts
Stainless Steel AISI 304

Nuts
Stainless Steel AISI 304

Upper Float
High Density Polyethylene

Connecting Screws
Cheesehead Stainless Steel AISI 304

Spring
Stainless Steel AISI 304

Adjusting Rod
Stainless Steel AISI 304

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 Seat
EPDM Rubber

Anti-Surge Orifice Float
High Density Polyethylene

O - Ring Seat
EPDM Rubber

Connecting Bracket
Stainless Steel AISI 304

Nozzle Seat Retaining Plate
Stainless Steel AISI 304

Nozzle
Stainless Steel AISI 304

Nozzle Seat
EPDM Rubber

Body
Stainless Steel AISI 304L

Lower Float Assembly
High Density Polyethylene

Note: 50 (2") Threaded BSP/NPT Male Inlet Valves are available in AISI 316L on request.

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Series RGXb

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION

THREADED 50 (2") & STUDDED INLET - 80 (3") TO 100 (4") EXPANDED BODY

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

End Connection:
Flange with Threaded BSP/NPT Male - 50 (2") valves.
Flange with Screwed Studs - 80 (3") & 100 (4") valves

Nominal Sizes:
DN50 (2")
DN80 (3")
DN100 (4")

Model No's:
RGXb 1611/1621
RGXb 2511/2521
RGXb 1601/1631
RGXb 2501/2531

Pressure Ratings:
PN16 (232 psi)
PN25 (363 psi)
PN16 (232 psi)
PN25 (363 psi)

Note: 50 (2") Threaded BSP/NPT Male Inlet Valves are available in AISI 316L on request.

Information subject to change without prior notice

page: 23
revision date: Oct 2006
Series RGXb

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION
STUDED INLET - 150 (6") & 200 (8")

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

End Connection: Flange with Screwed Studs - 150 (6") & 200 (8") valves.

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

Model No's:
RGXb 1001/1031

Pressure Ratings:
PN10 (145 psi)

Locating Disk
Stainless Steel AISI 304

Top Flange
Stainless Steel AISI 304

Screen Mesh
Stainless Steel AISI 304

Bolts
Stainless Steel AISI 304

Nuts
Stainless Steel AISI 304

Upper Float
High Density Polyethylene

Connecting Screws
Cheesehead Stainless Steel AISI 304

Spring
Stainless Steel AISI 304

Adjusting Rod
Stainless Steel AISI 304

Top Cover
Stainless Steel AISI 304

Top Cover Hex Bolt
Stainless Steel AISI 304

Top Cover Spacer
ABS Polyol PA737

O - Ring Seal
EPDM Rubber

O - Ring Seal
EPDM Rubber

Anti-Surge Orifice Float
High Density Polyethylene

O - Ring Seal
EPDM Rubber

Float Screw
Stainless Steel AISI 304

Nozzle Seat Retaining Plate
Stainless Steel AISI 304

Nozzle
Stainless Steel AISI 304

Nozzle Seat
EPDM Rubber

Body
Stainless Steel AISI 304L

Lower Float Assembly
High Density Polyethylene

Note: Valves are available in AISI 316L on request
information subject to change without prior notice
Series RGXb

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION
STUDDED INLET - 150 (6") & 200 (8") EXPANDED BODY

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

End Connection: Flange with Screwed Studs - 150 (6") & 200 (8") valves.

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

Model No’s:
- RGXb 1601/1631
- RGXb 2501/2531

Pressure Ratings:
- PN16 (232 psi)
- PN25 (363 psi)

Locating Disk
Stainless Steel AISI 304

Spring
Stainless Steel AISI 304

Top Flange
Stainless Steel AISI 304

Screen Mesh
Stainless Steel AISI 304

Bolts
Stainless Steel AISI 304

Nuts
Stainless Steel AISI 304

O - Ring Seal
EPDM Rubber

Upper Float
High Density Polyethylene

Connecting Screws
Cheesehead Stainless Steel AISI 304

Adjusting Rod
Stainless Steel AISI 304

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

Anti-Surge Orifice Float
High Density Polyethylene

Float Screw
Stainless Steel AISI 304

Nozzle Seat Retaining Plate
Stainless Steel AISI 304

Nozzle
Stainless Steel AISI 304

Nozzle Seat
EPDM Rubber

Body
Stainless Steel AISI 304L

Lower Float Assembly
High Density Polyethylene

Studs
Stainless Steel AISI 304L

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

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Revision date: Oct 2006
Series RGXb

GENERAL SPECIFICATIONS
THREADED 50 (2") & STUDDED INLET - 80 (3") TO 200 (8")

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

End Connection:
Flange with DN50 (2") Male BSP/NPT Threaded and Screwed Studs for Alignment to BS4504, SABS 1123 or ANSI B16.5 Class 150 for DN80 (3") to DN200 (8”).

Nominal Sizes:
DN50 (2”), DN80 (3”), DN100 (4”), DN150 (6”) & DN200 (8”)

Model No’s:
RGXb 1011/1021 _______ PN10 (145 psi)
RGXb 1001/1031 _______ PN10 (145 psi)

Operating Pressure Range - psi:
PN10 (145 psi) Min Max. 0.5 (7.2) 10 (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 - 0.5 bar (7.2 psi)
iii) Small orifice function test at max. rated working pressure (minimum 1 valve in 10).

OVERALL DIMENSIONS & WEIGHTS

<table>
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<tr>
<th>DN</th>
<th>Model No.</th>
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*Information subject to change without prior notice*

page: 26
revision date: Oct 2006
Type:
Double Orifice (Small & Large Orifice) with Bias mechanism for large volume air intake and controlled air discharge.

End Connection:
Flange with DN50 (2") Male BSP/NPT Threaded and Screwed Studs for Alignment to BS4504, SABS 1123 or ANSI B16.5 Class 150 & Class 300 for DN80 (3") to DN200 (8").

Nominal Sizes:
DN50 (2"), DN80 (3"), DN100 (4"), DN150 (6") & DN200 (8")

Model No's:  
RGXb 1611/1621  
RGXb 2511/2521  
RGXb 1601/1631  
RGXb 2501/2531

Pressure Ratings - bar (psi):
- PN16 (232 psi)  
- PN25 (363 psi)

Operating Pressure Range - bar (psi):
- Min  
  - PN16 (232 psi)  
  - PN25 (363 psi)  
- Max  
  - 16 (232)  
  - 25 (363)

Function:
- i) High volume air intake - pipeline draining  
- 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 23 & 25

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

OVERALL DIMENSIONS & WEIGHTS

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Information subject to change without prior notice
Page: 27  
Revision date: Oct 2006
VENT-O-MAT MODEL NO.
Page 26 - Series RGXb - DN50 (2") to DN200 (8").
Page 27 - Series RGXb - DN50 (2") to DN200 (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 DN150 (6") valve shall have a DN150 (6") intake orifice. Large orifice sealing shall be effected by the flat face of the 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 PN10, 16 or 25 ratings of BS4504 or SABS 1123 Standards or ANSI B16.5 Class 150 or Class 300 Standards. 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 excluded.

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 0.5 bar (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. 0.5 bar (7.2 psi) to 10 bar (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.
Series RGXv

OPERATION

1. Venting of a filling pipeline (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

Information subject to change without prior notice
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. PRESSURIZED AIR/GAS 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 - for this reason NO FLUSHING CONNECTIONS ARE NECESSARY.

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 - for this reason NO FLUSHING CONNECTIONS ARE NECESSARY

*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.
Series RGXv

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION
THREADED 50 (2") & STUDDED INLET - 80 (3") TO 100 (4")

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

End Connection:
Flange with Threaded BSP/NPT Male - 50 (2") valves. Flange with Screwed Studs - 80 (3") & 100 (4") valves.

Nominal Sizes:
DN50 (2")
DN80 (3")
DN100 (4")

Model No's:
RGXv 1011/1021
RGXv 1001/1031

Pressure Ratings:
PN10 (145 psi)

Note: 50 (2") Threaded BSP/NPT Male Inlet Valves are available in AISI 316L on request.

information subject to change without prior notice
Series RGXv

COMPOSITE DESCRIPTION & MATERIAL SPECIFICATION
THREADED 50 (2") & STUDDED INLET - 80 (3") TO 100 (4") EXPANDED BODY

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

End Connection:
Flange with Threaded BSP/NPT Male - 50 (2") valves.
Flange with Screwed Studs - 80 (3") & 100 (4") valves.

Nominal Sizes:
DN50 (2")
DN80 (3")
DN100 (4")

Model No's:
RGXv 1611/1621 PN16 (232 psi)
RGXv 2511/2521 PN25 (363 psi)
RGXv 1601/1631 PN16 (232 psi)
RGXv 2501/1631 PN25 (363 psi)

Pressure Ratings:

Note: 50 (2") Threaded BSP/NPT Male Inlet Valves are available in AISI 316L on request.

information subject to change without prior notice
Type: Series RGXv - Triple Orifice with "Anti-Surge" Mechanism.

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

Model No's: RGXv 1001/1031

Pressure Ratings:
- PN10 (145 psi)

End Connection: Flange with Screwed Studs - 150 (6") & 200 (8") valves.

Top Flange
- Stainless Steel AISI 304

Screen Mesh
- Stainless Steel AISI 304

Vent Float
- High Density Polyethylene

Bolts
- Stainless Steel AISI 304

O-Ring Seals
- 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 304

Note: Valves are available in AISI 316L on request. Information subject to change without prior notice.
Series RGXv

COMPONENT DESCRIPTION & MATERIAL SPECIFICATION
STUDED INLET - 150 (6") & 200 (8") EXPANDED BODY

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

End Connection:
Flange with Screwed Studs - 150 (6") & 200 (8") valves.

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

Model No's:
RGXv 1601/1631
RGXv 2501/2531

Pressure Ratings:
PN16 (232 psi)
PN25 (363 psi)

Note: Valves are available in AISI 316L on request
information subject to change without prior notice
**Series RGXv**

**GENERAL SPECIFICATIONS**

**THREADED 50 (2") & STUDED INLET - 80 (3") TO 200 (8")**

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

**End Connection:**
Flange with DN50 (2") Male BSP/NPT Threaded and Screwed Studs for Alignment to BS4504, SABS1123 or ANSI B16.5 Class 150 for DN80 (3") to DN200 (8”).

**Nominal Sizes:**
DN50 (2”), DN80 (3”), DN100 (4”), DN150 (6”) & DN200 (8”)

**Model No’s:**
- RGXb 1011/1021 
  - PN10 (145 psi)
- RGXb 1001/1031 
  - PN10 (145 psi)

**Pressure Ratings - bar (psi):**
- RGXb 1011/1021: PN10 (145 psi)
- RGXb 1001/1031: PN10 (145 psi)

**Operating Pressure Range - bar (psi):**
- PN10 (145 psi) Min 0.5 (7.2) Max 10 (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 - 0.5 bar (7.2 psi)
- iii) Small orifice function test at max. rated working pressure (minimum 1 valve in 10).

**OVERALL DIMENSIONS & WEIGHTS**

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Note: DN50 (2") valves have DN50 (2") BSP/NPT male inlet connections as standard.

Page: 35
Revision date: Oct 2006

Information subject to change without prior notice.
**Series RGXv**

**GENERAL SPECIFICATIONS**

**THREADED 50 (2") & STUDDED INLET - 80 (3") TO 200 (8") EXPANDED BODY**

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

**End Connection:**
Flange with DN50 (2") Male BSP/NPT Threaded and Screwed Studs for Alignment to BS4504, SABS1123 or ANSI B16.5 Class 150 & Class 300 for DN80 (3") to DN200 (8").

**Nominal Sizes:**
DN50 (2"), DN80 (3"), DN100 (4"), DN150 (6") & DN200 (8")

**Model No's:**
- RGXb 1611/1621 - Pressure Ratings - psi:
  - 16 (232 psi)
- RGXb 2511/2521 - Pressure Ratings - psi:
  - 25 (363 psi)
- RGXb 1601/1631 - Pressure Ratings - psi:
  - 16 (232 psi)
- RGXb 2501/2531 - Pressure Ratings - psi:
  - 25 (363 psi)

**Nominal Sizes:**
DN50 (2"), DN80 (3"), DN100 (4"), DN150 (6") & DN200 (8")

**Pressure Ratings - psi:**
- MIN: 16 (232 psi)
- MAX: 25 (363 psi)

**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 - 0.5 bar (7.2 psi)
- iii) Small orifice function test - at max. rated working pressure (minimum 1 valve in 10).

**OVERALL DIMENSIONS & WEIGHTS**

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Note: DN50 (2") valves have DN50 (2") BSP/NPT male inlet connections as standard.

Information subject to change without prior notice

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Revision date: Oct 2006
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 DN150 (6") valve shall have a DN150 (6") intake orifice. Large orifice sealing shall be effected by the flat face of the 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 PN10, 16 or 25 ratings of BS4504 or SABS 1123 Standards or ANSI B16.5 Class 150 or Class 300 Standards. 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 excluded.

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 0.5 bar (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.
Note:
1. DN250 (10") and DN300 (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 0.5 bar (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 2 - 3 bar (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.
Complete the form below for any additional information and fax/post to:

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P.O. Box 5064
Benoni South
South Africa
1502

Tel: (+27 11) 748 0200       Fax: (+27 11) 421 2749
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