

Compact, Self-Closing Vacuum Breakers Protect Against Hazards, Damage and Financial Losses Caused by Vacuum!



Series VBS



Series VBM

Features/Benefits with Proper Installation:

- Designed to protect enclosed tanks from collapse or structural damage during draining.
- Eliminates siphoning of dangerous fluids.
- Prevents vacuum which can cause damage to sensitive instruments and filters.
- Normally-closed design prevents fugitive emissions from leaving system.
- Insurance against replacement of damaged expensive equipment... avoids critical system downtime.
- Patented diaphragm design assures dependable, repetitive, bubble-tight sealing in VBM and VB; PFA encapsulated spring and special poppet provide identical performance in VBS design.
- For corrosive or ultra-pure liquid applications.
- Sizes: 1/2", 3/4", 1", 1 1/2", 2", 3" and 4".

Materials of Construction:

Series VBM Vacuum Breakers are molded of type 1, grade 1, PVC (Polyvinyl Chloride), Glass-filled Polypropylene, Kynar® PVDF and Corzan® CPVC in sizes 1/2", 3/4" and 1". A machined version, Series VB is available in PTFE in sizes 3/4" and 1". Diaphragms are of EPDM or FKM (comparable to Viton® brand). VBS Vacuum Breakers are available in standard PVC (Polyvinyl Chloride), Natural Polypropylene, Kynar® PVDF, and Corzan® CPVC in sizes 1 1/2", 2", and 3". Standard dust caps on PVDF models are natural polypropylene; PVDF is optional. Seals are EPDM or FKM. Threaded or socket connections are standard on all models.

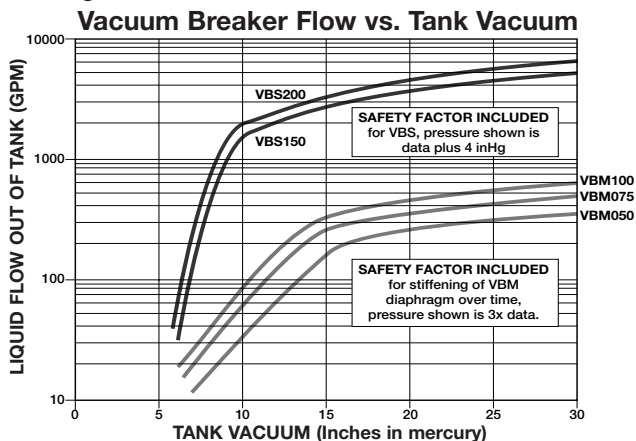
Design:

The Plast-O-Matic VBM Vacuum Breakers have only one moving part – the patented self-sealing diaphragm, and this provides both design simplicity and maximum operating dependability. This normally-closed design seals in the identical location every time producing a very dependable, long-life seal. Series VBS Vacuum Breakers feature a corrosion resistant PFA encapsulated spring which acts on a poppet seal that neither sticks nor chatters. Maximum working pressure is 100 PSI @ 75°F (6,9 bar @ 24°C). See pressure/temperature ratings on reverse side. Spring material (non-wetted) is 303-304 stainless steel.

Operation and Installation:

Plast-O-Matic Vacuum Breakers feature a patented, normally-closed, design that can be mounted in any position; however, upright is recommended. For enclosed tank applications, mounting should be at the highest point of the tank.

These Vacuum Breakers will begin to break a vacuum at approximately 2 inches of mercury (1.0 PSI or 0,07 Bar negative pressure). Full vacuum is 29 inches of mercury. For applications either draining or pumping from enclosed tanks, the tanks must be able to withstand much more than 2 inches of mercury of vacuum, as illustrated in the chart below. The chart is based upon a 3.5 times safety factor, and it clearly shows that as the rate of liquid flow leaving the tank increases, the resulting vacuum in the tank also increases.



Explanation of Graph:

1. The above graph relates liquid flow leaving an enclosed tank to the resulting vacuum created in the tank as air is entering the tank through the Vacuum Breakers. A safety factor of 3.5 times is used in constructing the graph.
2. To use the graph determine the rate of flow when draining the tank and from that location on the vertical axis read across to the graph of the proper vacuum breaker size. At this intersection of the graph read down to the horizontal axis and determine the vacuum for the tank. This is the recommended vacuum rating of the tank which must be checked with the tank manufacturer's rating to be sure the tank is strong enough.

Anti-Siphon Applications:

For these applications the Vacuum Breakers must be installed in a "U-bend" at least 30 inches (2 1/2 feet or 76 cm) above the highest liquid level. Depending on the safety factor desired for Anti-Siphoning this height would become 60 inches (5 feet or 152 cm) at 2 times safety factor which is recommended by Plast-O-Matic.

Use Caution in Dangerous Applications:

In the event a diaphragm failure could cause spraying of a dangerous liquid onto nearby equipment or personnel, or simply into the atmosphere where breathing the vapors would be dangerous, it is strongly advised to use a Plast-O-Matic Check Valve in lieu of the Vacuum Breaker, and pipe the vent or inlet side of the check valve to a safe remote location. The Check Valve will have the same flow capabilities of the Vacuum Breaker, and contains the same design.

Elimination of Vacuum in a System:

To prevent instrument or system malfunction, the same considerations are involved as in the tank application. The vacuum breaker should be installed at the highest location in the system. Plast-O-Matic Vacuum Breakers can be mounted in any position since they are self-sealing and do not rely on gravity to operate; however, upright is preferred. Also see Anti-Siphon section.

FOR VBS 3" & 4" REFER TO NEXT PAGE

PLAST-O-MATIC VALVES, INC.

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Dimensions and Material Availability:

Series VBM – Molded Models: PVC, GPP, PVDF & CPVC

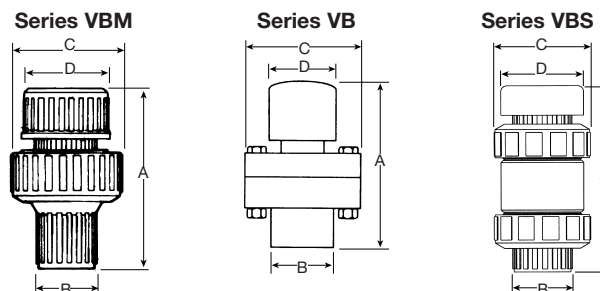
| Pipe Size | A | | B | | C | | D | |
|-----------|-----|-----|-----|----|-----|----|-----|----|
| | In. | mm | In. | mm | In. | mm | In. | mm |
| 1/2 | 4.3 | 110 | 1.3 | 33 | 2.4 | 62 | 1.9 | 48 |
| 3/4 | 4.6 | 117 | 1.6 | 39 | 2.8 | 72 | 2.3 | 59 |
| 1 | 5.1 | 130 | 1.9 | 48 | 2.8 | 72 | 2.5 | 64 |

Series VB – Machined Models: PTFE

| | | | | | | | | |
|-----|-----|-----|-----|----|-----|----|-----|----|
| 3/4 | 4.5 | 114 | 1.9 | 48 | 3.0 | 76 | 2.0 | 51 |
| 1 | 4.5 | 114 | 1.9 | 48 | 3.0 | 76 | 2.0 | 51 |

Series VBS – PVC, PP, PVDF & CPVC

| | | | | | | | | |
|-------|-----|-----|-----|----|-----|-----|-----|----|
| 1-1/2 | 7.9 | 193 | 2.5 | 64 | 4.1 | 104 | 3.5 | 89 |
| 2 | 8.5 | 209 | 3.0 | 76 | 4.1 | 104 | 3.5 | 89 |



Pressure/Temperature Rating:

Series VBM – Molded Models: PVC, GPP, PVDF & CPVC

| Valve Body Material | Valve Diaphragm Material | Maximum Working Pressure | | | | | | |
|---------------------|--------------------------|--------------------------|--------------|--------------|--------------|---------------|---------------|---------------|
| | | 75°F (24°C) | 110°F (43°C) | 140°F (60°C) | 180°F (82°C) | 220°F (104°C) | 240°F (115°C) | 284°F (140°C) |
| PVC | EPDM | 100 | 100 | 40 | NR | NR | NR | NR |
| | FKM | 100 | 100 | 40 | NR | NR | NR | NR |
| GPP | EPDM | 100 | 100 | 100 | 80 | NR | NR | NR |
| | FKM | 100 | 100 | 100 | 80 | NR | NR | NR |
| PVDF | EPDM | 100 | 100 | 100 | 100 | NR | NR | NR |
| | FKM | 100 | 100 | 100 | 100 | 60 | 30 | 10 |
| CPVC | EPDM | 100 | 100 | 80 | 40 | NR | NR | NR |
| | FKM | 100 | 100 | 80 | 40 | NR | NR | NR |

Series VB – Machined PTFE Models

| | | | | | | | | |
|------|------|-----|----|----|----|----|----|----|
| PTFE | EPDM | 100 | 90 | 80 | 70 | NR | NR | NR |
| | FKM | 100 | 90 | 80 | 70 | 40 | 20 | 10 |

Series VBS – PVC, PP, PVDF, & CPVC

| | | | | | | | | |
|------|------|-----|-----|-----|-----|----|----|----|
| PVC | EPDM | 100 | 100 | 40 | NR | NR | NR | NR |
| | FKM | 100 | 100 | 40 | NR | NR | NR | NR |
| PP | EPDM | 100 | 80 | 50 | 30 | NR | NR | NR |
| | FKM | 100 | 80 | 50 | 30 | NR | NR | NR |
| PVDF | EPDM | 100 | 100 | 100 | 100 | NR | NR | NR |
| | FKM | 100 | 100 | 100 | 100 | 60 | 30 | 10 |
| CPVC | EPDM | 100 | 100 | 80 | 40 | NR | NR | NR |
| | FKM | 100 | 100 | 80 | 40 | NR | NR | NR |

Ordering Information for Series VBM & VB

| Pipe Size | Series VBM-PVC FKM Seals | Series VBM-GPP FKM Seals | Series VBM-PVDF FKM Seals | Series VBM-CPVC FKM Seals | Series VB-TF FKM Seals |
|-----------|--------------------------|--------------------------|---------------------------|---------------------------|------------------------|
| 1/2" | VBM050V-PV | VBM050V-PP | VBM050V-PF | VBM050V-CP | N.A. |
| 3/4" | VBM075V-PV | VBM075V-PP | VBM075V-PF | VBM075V-CP | VB075V-TF |
| 1" | VBM100V-PV | VBM100V-PP | VBM100V-PF | VBM100V-CP | VB100V-TF |

Ordering Information for Series VBS

| Pipe Size | PVC FKM Seals | Natural Polypro FKM Seals | Corzan CPVC FKM Seals | Kynar PVDF FKM Seals |
|-----------|---------------|---------------------------|-----------------------|----------------------|
| 1-1/2" | VBS150V-PV | VBS150V-PP | VBS150V-CP | VBS150V-PF |
| 2" | VBS200V-PV | VBS200V-PP | VBS200V-CP | VBS200V-PF |
| 3" | VBS300V-PV | VBS300V-PP | VBS300V-CP | VBS300V-PF |

- Notes:** Threads are standard. Socket ends available on VBM models in PVC. For other body material consult factory. Above shown with FKM seals. For EPDM Seals, change "V" to "EP" (ex. VBS150EP-PV).
 1. For socket end connectors specify "S" in part number (ex. VBS150VT-PV).
 2. For threaded ends connectors specify "T" in part number (ex. VBS150VT-PV).
 * Natural Polypro is non-filled, non-pigmented 100% virgin resin

SERIES VBS 3" & 4"

Construction & Materials

VBS Vacuum Breakers are available in Geon[®] PVC, Natural Polypropylene, Corzan[®] CPVC and Kynar[®] PVDF in sizes 3" and 4". Standard dust caps match body material with the exception of PVDF models which are natural polypropylene; PVDF dust cap is optional. External, non-wetted fasteners are used on Series VBS in 3" & 4" sizes and are 300 series stainless steel. The self-guided spring is completely encapsulated (not coated) with PFA. The encapsulation is not "adhered" to the spring. It flexes independently of the spring and does not crack or flake the way coatings can. This encapsulation has been tested for over 1,000,000 cycles in laboratory conditions with no ill effects.

Series VBS **seals** are EPDM or FKM.

For alternate materials, please consult factory. Minimum quantities apply.

Threaded connections are standard on all models. Socket ends, BSP threads, JIS and DIN connections are available on all sizes and materials. Inlet connection is shipped with standard dust cap. Cap is removable for applications where pipe connection is desired due to location, potential hazard, etc. The inlet connection is identical to the connection on the system side of the valve. If your application requires an unusual connection, custom material or configuration, please contact our Technical Team at 973-256-3000.



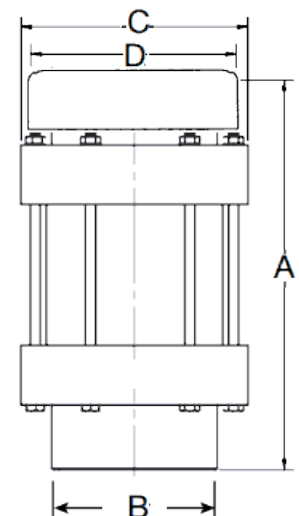
VBS 3" & 4" Dimensions – All Materials

| PIPE SIZE | A | | B | | C | | D | |
|-----------|-------|-----|------|-----|------|-----|-----|-----|
| | In. | mm | In. | mm | In. | mm | In. | mm |
| 3" | 10.5 | 268 | 4.2 | 107 | 5.8 | 147 | 5.5 | 140 |
| 4" | 12.83 | 326 | 5.75 | 146 | 7.88 | 200 | 7.5 | 191 |

Ordering Information

| Pipe Size | PVC Viton Seals | Natural Polypro Viton Seals | Kynar PVDF Viton Seals | Corzan CPVC Viton Seals |
|-----------|-----------------|-----------------------------|------------------------|-------------------------|
| 3" | VBS300VT-PV | VBS300VT-PP | VBS300VT-PF | VBS300VT-CP |
| 4" | VBS400VT-PV | VBS400VT-PP | VBS400VT-PF | VBS400VT-CP |

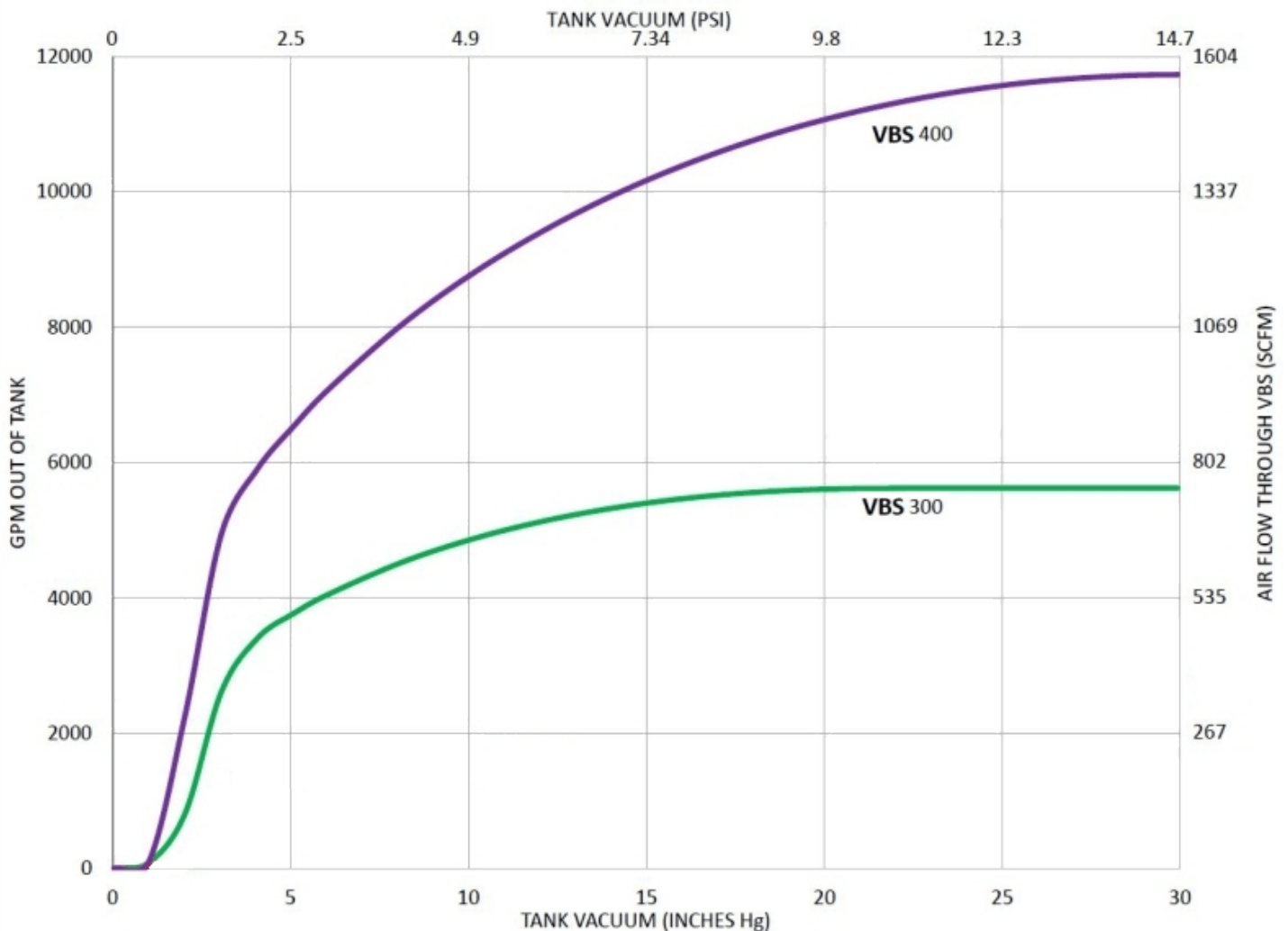
Part numbers shown with FKM seals and threaded connections.
 For EPDM seals, change second V to EP. Example: VBS300EPT-PV
 For socket connections, change T to S. Example: VBS300VS-PV



VBS34D-0622-1

FLOW PERFORMANCE

VBS AIR FLOW CHART - CALCULATED DATA AT 70°F



Explanation of Graph:

The above graphs relate liquid flow leaving an enclosed tank to the resulting vacuum created in the tank as air is entering the tank through the Vacuum Breakers.

To use the graph, determine the rate of flow when draining the tank in SCFM and from that location on the vertical axis read across to the graph of the proper vacuum breaker size. At this intersection of the graph read down to the horizontal axis and determine the vacuum for the tank. This is the recommended vacuum rating of the tank which must be checked with the tank manufacturer's rating to be sure the tank is strong enough.