

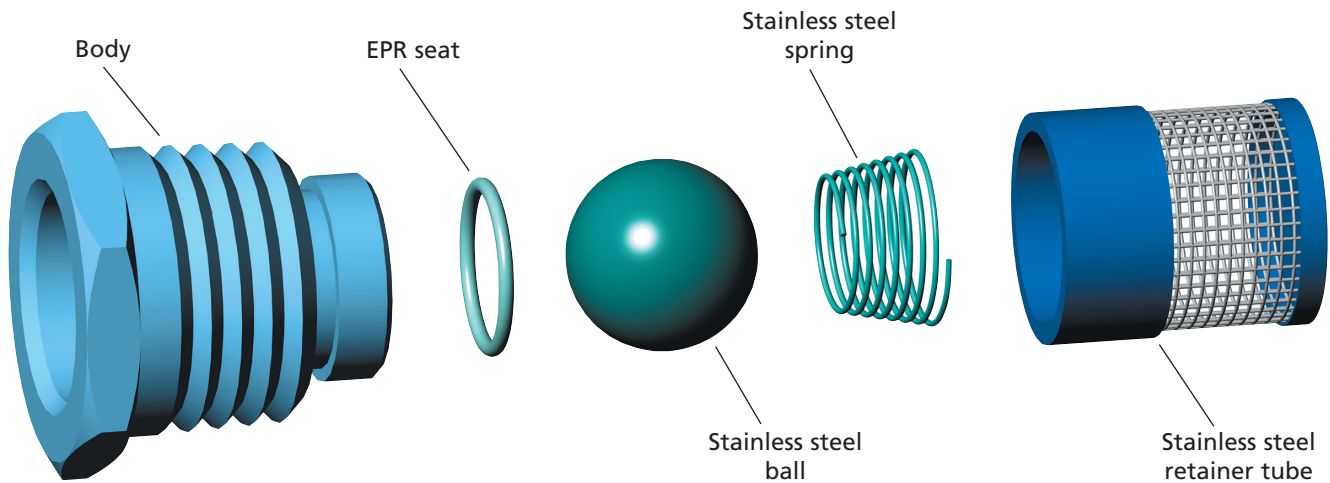
# Vacuum Breakers

Anti-Siphoning Check Valves



- Vacuum check valves and backflow devices
- Protection against collapse or back flowing

# Series VB8



## Fast Acting, Tight Closing, High Capacity

Kadant Johnson vacuum breakers provide a simple, dependable way to relieve any unwanted vacuum condition that may develop in a closed vessel or pipeline. They can be used to prevent contamination from back flowing in fluid handling systems and to protect equipment against collapse or implosion. They combine tight closing with instant response; provide large air venting capacity; are designed for easy installation and long service life.

## Positive Closing, Low Breakaway

The successful combination of the spring action on a round ball and the soft resilient seat assures positive bubble-tight closing, even at very low differential pressures. And, of course, the higher the pressure the tighter the seal.

Since only slight spring pressure is needed for seating, the ball comes off the soft seat at a very low vacuum condition, providing almost instantaneous protection. Sealing is accomplished by an EPR O-ring. The supporting seat, however, is designed to assume any pressure in excess of the small amount needed for sealing, thus preventing any excessive compression of the O-ring.

## Quiet, Trouble-Free Operation

The soft resilient seat, combined with the gentle spring action, provides quiet opening and closing; chatter is completely eliminated. Corrosion-resistant seating surfaces leave little danger of any sticking or leaking. The simple design assures long and dependable service life, as proven both in the laboratory and in the field.

## Easily Installed, Easily Maintained

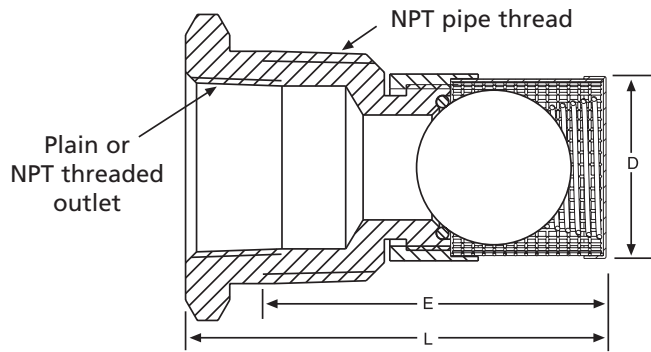
Kadant Johnson vacuum breakers have hex heads and standard NPT pipe threads, and are simply threaded into pipe fittings or available tank openings. Outlets can be threaded if desired.

## Rigorously Tested

In exhaustive endurance tests Kadant Johnson vacuum breakers have been subjected to 120 psig of steam and then vacuum, four times a minute, and still opened freely and closed bubble-tight after a million such test cycles. Every individual vacuum breaker is bubble-tested before it leaves the factory.

## High-Pressure and Temperature

Kadant Johnson vacuum breakers are rated for use with pressures up to 300 psig and temperatures up to 365°F. Higher operating pressures are possible, depending upon size, seal materials, and temperatures.



Size	Quick Ship No. (Brass)	Quick Ship No. (Stainless Steel)	Outlet	Outlet Size	Total Length "L"	Engaged Length "E"	O.D. of Tube "D"	Diameter of Orifice
3/8"	-	24A75500	Plain	1/4"	1 1/2"	1 1/8"	9/16"	1/4"
3/8"	24A75200	24A75600	Threaded	1/4"	1 1/2"	1 1/8"	9/16"	1/4"
1/2"	24A75900	24A76300	Plain	3/8"	1 3/4"	1 3/8"	1 1/16"	9/32"
1/2"	24A76000	24A76400	Threaded	3/8"	1 3/4"	1 3/8"	1 1/16"	9/32"
3/4"	24A76700	24A77100	Plain	1/2"	2 1/8"	1 5/8"	1 3/16"	13/32"
3/4"	24A76800	24A77200	Threaded	1/2"	2 1/8"	1 5/8"	1 3/16"	13/32"
1"	24A77500	24A77900	Plain	3/4"	2 3/8"	1 7/8"	1 1/16"	19/32"
1"	24A77600	24A78000	Threaded	3/4"	2 3/8"	1 7/8"	1 1/16"	19/32"
1 1/4"	24A78300	24A78500	Plain	1"	2 15/16"	2 5/16"	1 5/16"	3/4"
1 1/4"	24A78400	24A78600	Threaded	1"	2 15/16"	2 5/16"	1 5/16"	3/4"
1 1/2"	24A78700	24A78900	Plain	1 1/4"	3 1/16"	2 1/2"	1 9/16"	7/8"
1 1/2"	24A78800	24A79000	Threaded	1 1/4"	3 1/16"	2 1/2"	1 9/16"	7/8"

## Simple Installation

The drawings at the right show how the vacuum breaker can be installed in a threaded opening in either a vertical or horizontal position. When installed in a pipeline fitting, use of a reducing bushing is required to make sure the vacuum breaker does not intrude far enough to impede flow in the line or bind against any internal wall.

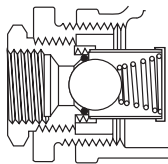


Figure 1

Figure 1  
Horizontal installation in either end or side outlet of tee, showing use of reducing bushing.

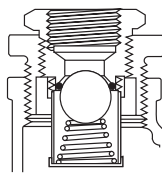


Figure 2

Figure 2  
Vertical installation in top outlet of tee, showing use of reducing bushing.

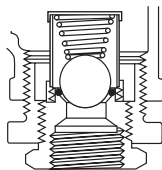


Figure 3

Figure 3  
Vertical installation in bottom outlet of tee, showing use of reducing bushing.

## Vacuum Required to Open

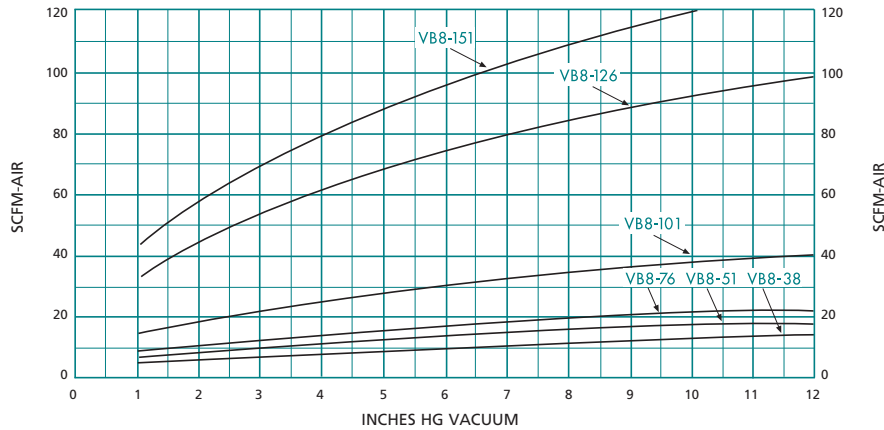
		Horizontal		Vertical		
				Top Outlet	Bottom Outlet	No Spring
VB8-38 3/8"	In. H <sub>2</sub> O	7.00	4.30	10.5	3.50	
	In. Hg	0.51	0.32	0.77	0.26	
	PSI	0.25	0.16	0.38	0.13	
VB8-51 1/2"	In. H <sub>2</sub> O	9.30	10.6	18.0	4.40	
	In. Hg	0.68	0.78	1.32	0.32	
	PSI	0.34	0.38	0.65	0.16	
VB8-76 3/4"	In. H <sub>2</sub> O	15.3	15.0	25.0	5.10	
	In. Hg	1.13	1.10	1.84	0.37	
	PSI	0.55	0.54	0.90	0.18	
VB8-101 1"	In. H <sub>2</sub> O	10.0	5.90	19.5	6.60	
	In. Hg	0.73	0.43	1.43	0.48	
	PSI	0.36	0.21	0.70	0.24	
VB8-126 1 1/4"	In. H <sub>2</sub> O	10.5	7.10	21.0	6.90	
	In. Hg	0.77	0.52	1.54	0.51	
	PSI	0.38	0.26	0.76	0.25	
VB8-151 1 1/2"	In. H <sub>2</sub> O	10.0	4.90	20.3	7.90	
	In. Hg	0.73	0.36	1.49	0.58	
	PSI	0.36	0.18	0.73	0.29	

Note: Stainless steel ball was used to arrive at all figures.

Values given are averages of test results and may vary slightly.

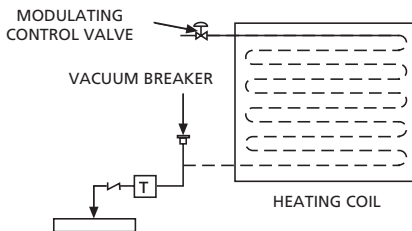
## Approximate Air Handling Capacities

The air handling capacity curves were plotted from calculations using the  $C_v$  factors of the vacuum breaker. The  $C_v$  factor is a flow coefficient determined by actual test which mathematically gives the relationship between the rate of flow and the pressure drop. The flow formula used was recommended by the Fluid Controls Institute.

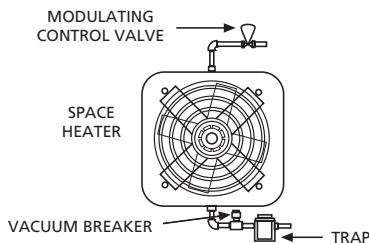


NOTE: Capacities will vary slightly due to position of installation.

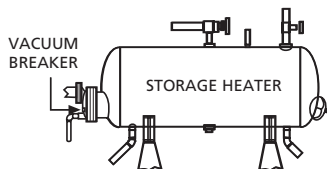
## Typical Installations of Vacuum Breakers



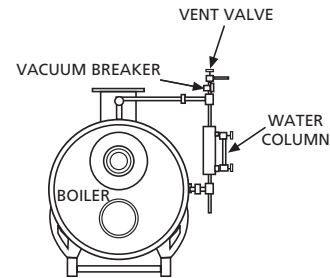
Vacuum breaker installed on heating coil. When the modulating control valve closes, the steam in the coil will condense. A vacuum may exist in the coil even with the control valve partly open and positive pressure between the control valve and the coil.



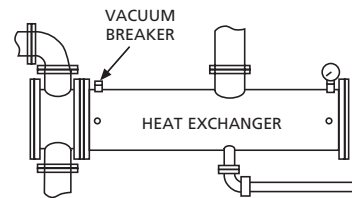
Typical space heater installation with vacuum breaker protection.



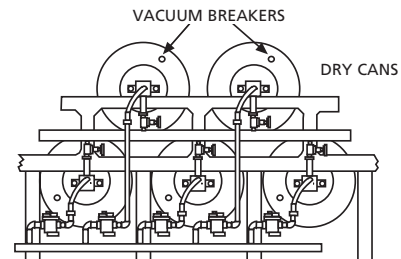
Horizontal storage heater with heating coils protected by a vacuum breaker.



Typical application of a vacuum breaker as used on a steam boiler to break a vacuum imposed when a boiler is shut down, thereby condensing the steam in the boiler and creating a vacuum. This condition causes the boiler to be flooded by pulling in excess water from the return system.



Typical installation of a vacuum breaker in a heat exchanger.



Textile dry cans, multiple slasher cylinders, print cans, etc., can be protected against collapse with vacuum breakers.

Dimensions are for reference only and subject to change.