

Know How Vacuum Valves



Vacuum breakers protect vessels and pipelines against vacuum. A vacuum can build up when a system is being drained, when it cools down or when a pump fails. Vacuum control valves are pressure reducing or overflow valves which control pressures below 1 bara.

Vacuum control valves

See Know How pressure reducing valves and overflow valves.

Vacuum breakers

Operation

Vacuum breakers protect installations, vessels etc. against vacuum. They are normally closed. If the pressure inside a tank or vessel drops below atmospheric pressure by more than the set differential pressure, the valve opens causing the system to be vented until the set pressure difference has been established again. Vacuum breakers remain closed when the pressure rises above atmospheric; therefore they do not offer protection against excessive pressure.

Selecting valve type and nominal diameter

Vacuum breakers should be selected according to the pressure difference between the atmospheric pressure and the pressure inside the vessel or pipeline, not according to the vacuum or absolute pressure in the vessel or pipeline. All specifications given in data sheets or tables or on the scales of valves etc., relate to this differential pressure. Another factor which must be taken into account when selecting a vacuum valve is the suction capacity. For very small differential pressures vacuum control valves can be used as vacuum breakers.

Vacuum breaker capacity table

Please use the capacity table to select your vacuum breaker. The table applies to valve types 34, 35 and 36. On the left side you will find the nominal diameter; at the top (horizontally) you find the differential pressure given in bar at which the valve opens.

Full opening at set pressure

For applications which require a vacuum breaker to open fully at the set pressure (to prevent a further rise in vacuum), our weight-loaded vacuum breakers type 43 or 44 should be used.

Seat leakage

In their standard form vacuum breakers are supplied with a metallic cone seal which requires less maintenance than a soft seal. For more stringent leakage specifications these valves can be supplied with soft seals. As vacuum breakers may remain in closed position for longer periods, a soft seal tends to stick to the valve seat. The correct functioning of such valves can therefore be guaranteed only if they are serviced frequently and carefully. Also the soft elastomer seal limits the maximum possible operating temperature.

Protecting your system

If toxic or hazardous media are used measures must be taken to ensure that in the case of cone failure the hazardous medium can be drained in a controlled and safe manner. In such a case we recommend our type 33 with closed valve body and spring cap.

Protecting the vacuum breaker

As the suction orifices are open to atmosphere, they should be adequately protected against the ingress of dust, dirt or insects. If there is a danger of freezing the vacuum breaker should be fitted with a heating-jacket.

Setting the valve

The performance curves shown in the flow capacity diagram relate to fully open valves. To obtain these values under partial load conditions, the operating pressures on the scales of valve types 34 and 35 should always be set 0.05 bar below the pressures given in the diagram. The reason for this is the spring force which increases as the flow and cone movement increase.

Maintenance

Vacuum breakers should be cleaned and serviced regularly. Depending on the ambient operating conditions, the valve spindle should regularly be checked for freedom of movement. The service intervals should be specified in a maintenance schedule.

Valves free of oil and grease or silicone

Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, operating instruction etc. MUST be followed.