

Vacuum Relief

Theoretically, a deaerator may be subject to internal pressures as low as the vapor pressure of the coldest entering water stream that may be a considerable vacuum. The vessels should be protected against damage from excessive vacuum (external pressure) by either designing for full vacuum or by the use of vacuum relief devices (vacuum breakers). As a nominal procedure, vacuum breakers shall be sized to pass the volume of the deaerator and storage vessels in one minute. Allowable external pressure may be calculated by ASME VIII rules and may be based on the new (as-built) vessel thicknesses, at design temperature.

Sizing of the vacuum breaker in accordance per the above is an approximate method and can not be certified as 100% accurate but will be suitable for the vast majority of installation.

Vacuum breaker valves may be common check valves or spring/weight loaded devices. When the User is not willing to accept some leakage from the vacuum breaker, the more costly spring or weight loaded device shall be specified.

Operation of the vacuum breaker will cause air to enter the deaerator that must be purged before full deaeration performance can be resumed. Frequent opening of the vacuum breakers indicates faulty design, maintenance, or configuration of the steam and/or level controls.