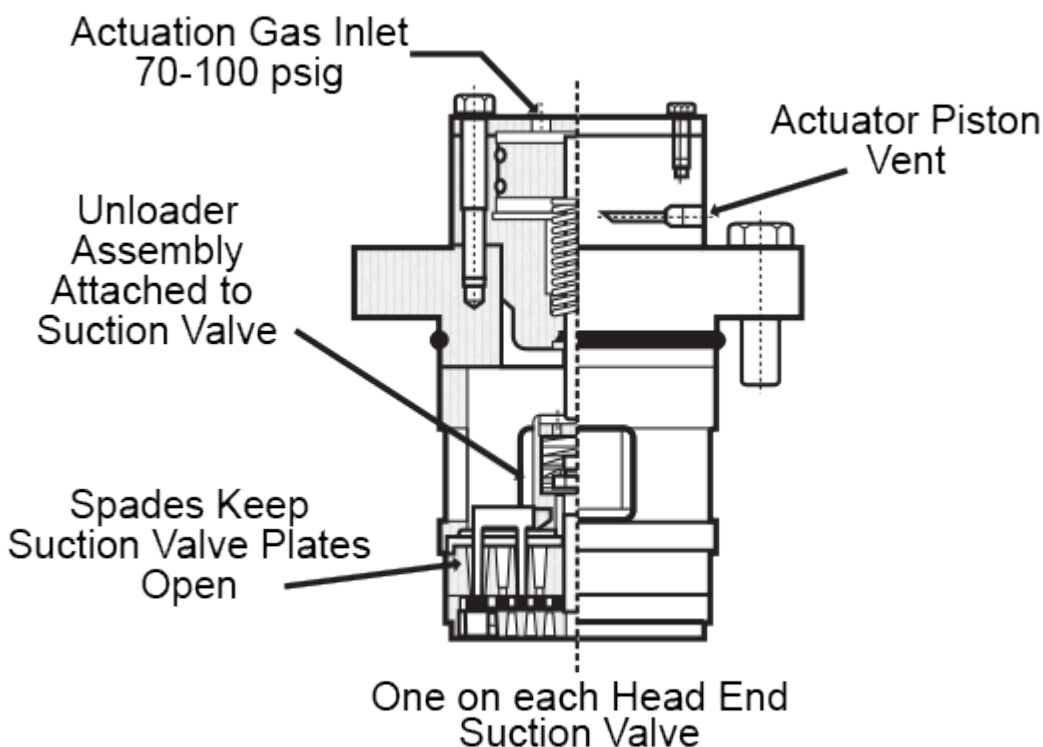


## Suction Valve Unloaders

See [Cylinder Action, Single Acting](#) for a drawing of a suction valve unloader installed on a cylinder.

A valve plate depressor type suction valve unloader will depress the suction valve plate against the valve guard to hold the valve open, therefore deactivating the end of the cylinder by allowing gas to pass through the valve during both intake and compression stroke. A valve plate depressor type suction valve unloader is actuated using air or natural gas as actuation gas (usually 70 to 100 psig). In most cases, the suction valve unloaders are normally loaded, with air or gas actuation pressure required to unload the cylinder end. Suction valve unloaders may be used only on plate or ring valves (not poppets).



Applications that require suction valve unloaders must be reviewed by Ariel / Hoerbiger before quoting. The valve depressors are always in the seat flow passages. This will reduce the valve equivalent area and increase the horsepower losses of the valve. Temperatures may also be increased due to a recirculation of the gas on the deactivated end preheating the active end. It is important that data regarding the entire range of suction pressures and gas compositions be submitted for review. The review will specify the valve plate materials, lifts and valve equivalent flow areas to be used for the application. Suction valve unloaders must be installed on all suction valves of the end being deactivated.

Ariel recommends using suction valve unloaders on the head end of cylinders only. Crank end deactivation may result in a non-rod load reversal situation. All deactivation configurations should be analyzed at all conditions to verify adequate rod load reversal.

Single acting cylinder operating cases should be considered when analyzing [torsional](#) responses and acoustical pulsation responses. Single Acting cylinders can present the worst case scenario for a torsional analysis due to a more dynamic torque effort curve and for an acoustical pulsation analysis due to a change in the number of pulses per cycle. High torsional vibration and / or high acoustically driven vibration can result from single acting cylinder operation when not considered in these analyses.

## Application Manual - Suction Valve Unloaders

High torsional vibrations can increase coupling and shaft stresses, driver functionality and auxiliary driven equipment integrity. High acoustical pulsations can increase frame, cylinder, gas piping and equipment vibrations.

An alternate method of single acting a cylinder is by removing the head end suction valves on one cylinder end. Suction valve removal will result in less horsepower loss as the unloading flow area is greater. Cylinders with suction pressures above 750 psi and or small valve sizes may not be suitable for suction valve unloaders.