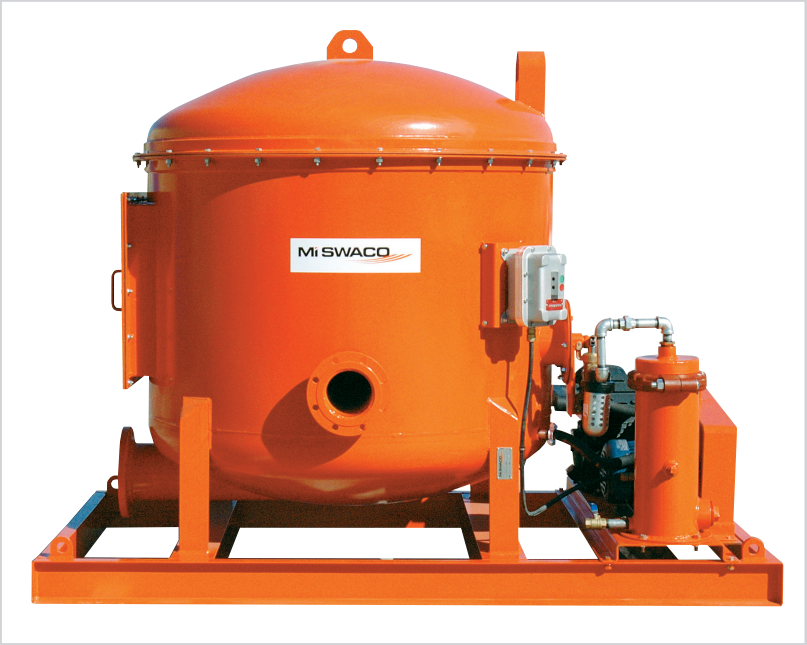
Compact Vacuum D-GASSER

Process overview

Gases are entrained in drilling fluids from the wellbore during normal drilling operations as well as during "kicks" or well-control situations. These gases present safety hazards and create operational problems when gas-laden fluid reaches the surface. Degassing is accomplished at the surface by one of two methods (1) atmospheric separation or (2) vacuum separation.

The simplest form of atmospheric degassing occurs naturally in the surface mud tank system. As the mud flows over the shale shakers and through the pits, gas bubbles will form in the mud and escape to the atmosphere. In event of hazardous gases being present, it is desirable to localize the point where gas is released from the mud by installing a vacuum-style degasser.

Vacuum-style degassers are installed in the first compartment downstream of the sand trap and upstream of any centrifugal pumps. Vacuum degassers work by removing entrained gases from the drilling fluid by exposing the fluid to pressures well below ambient atmospheric pressure.



Features and Benefits

- Fiberglass leaves eliminate corrosion; reduce repair and maintenance costs
- Large Cleanout Port allows easier access for cleaning inside of D-GASSER
- Greater surface area allows gas-entrained mud to be released more efficiently
- Interchangeability of many of the parts as the Horizontal D-GASSER allows use of existing inventory parts
- Same field-proven vacuum pump as Horizontal D-GASSER
- Shorter footprint can be installed in smaller spaces

How it works

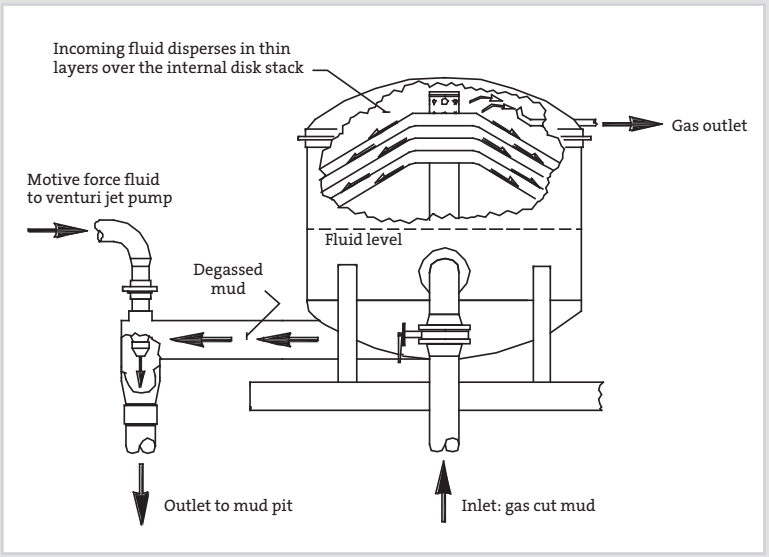
The M-I SWACO Compact D-GASSER unit works by removing entrained gases from the drilling fluid as illustrated at right. Vacuum degassing is more effective than atmospheric degassing due to the exposure of the drilling fluid to pressures well below ambient atmospheric pressure. The unit directs the incoming fluid flow over internal plates that create large surface areas over which thin layers of the fluid continuously flow. The transit time required for the gas to travel up, through the fluid and "break out" of the mud is minimized by spreading the fluid into thin layers.

At pressures below atmospheric pressure, the rate at which gas separates from a fluid is accelerated. The low pressure promotes the growth of large gas bubbles which rise rapidly to the nearest surface.

The free gas that breaks out of the drilling fluid is continuously removed from the vessel by the action of the piston-style vacuum pump on the unit. The removed gas is typically directed to the flare stack.

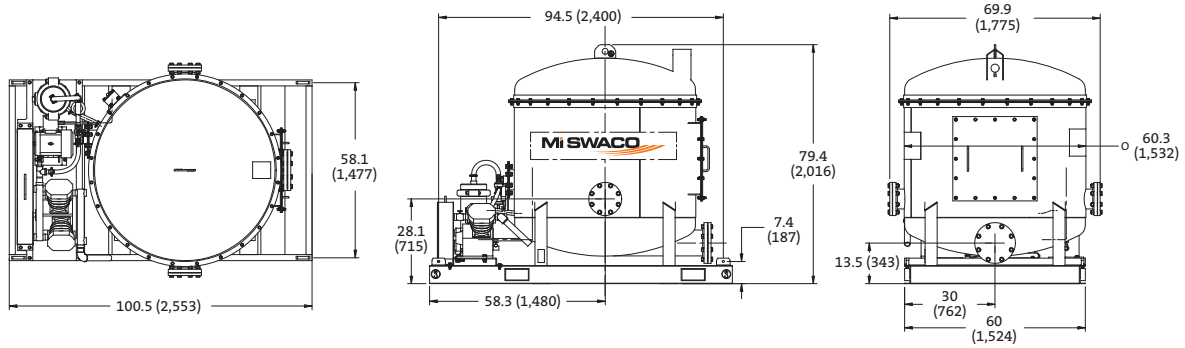
The level of mud within the vessel is controlled by a float valve to ensure that the disk stack is never submerged. As fluid level rises and lifts the float, air enters the vessel through the three-way valve to decrease the vacuum inside the vessel. With less vacuum inside the vessel, the rate at which fluid is drawn into the tank slows and the rate at which fluid exits the vessel increases. The fluid level inside the vessel drops rapidly until the float lowers and full vacuum is restored.

A liquid-trap tank in the gas-removal piping collects any fluid or condensate that may have entered the gas-removal piping. A float ball in the liquid-trap tank prevents the liquids from entering the vacuum pump.



ARRANGEMENT DRAWING: COMPACT D-GASSER

All dimensions are expressed in inches (millimeters).



Specifications

- Length 100.5 in. (2,553 mm)
- Width 69.9 in. (1,775 mm)
- Height 79.4 in. (2,016 mm)
- Vessel diameter 60 in. (1,524 mm)
- Weight (dry) 3,500 lb (1,587.6 kg)
- Capacity Up to 1,000 gpm (4,164 L/min)