

TOGA System

Almost all the gases encountered in drilling operations are extremely dangerous. This is due to the flammability and explosiveness of hydrocarbon vapors when mixed with air. These vapors may also contain highly corrosive hydrogen sulfide gas which is fatal to humans and can cause complete failure in some steels. Developed by M-I SWACO research and engineering, the TOGA* system combines two field-proven products — the M-I SWACO D-GASSER* and M-I SWACO MUD/GAS SEPARATOR* — working together to totally separate and vent or flare all gases.*

Features

Safely vents all gases. The TOGA system is a totally enclosed gas-separation system that safely removes and/or flares all gases in the drilling fluid circulated from the wellbore.

Efficient. Effectively contains and separates gases encountered while drilling.

Meets or exceeds safety regulations. The TOGA system meets USGS and Texas Railroad Commission regulations as well as API guidelines and NACE standards for drilling in H₂S environments.

Multiple applications. The TOGA system is suitable for both onshore and offshore applications. The system is available in a variety of efficient configurations including land, space-saving offshore, and highly mobile trailer-mounted versions.

Used primarily to control high-volume free gas, the TOGA system is also a valuable tool during a well kick to help control the near-surface expansion of gas. It is also ideal for control of continuous underbalanced drilling.



Features

- Totally enclosed system safely removes and/or flares all gases
- Ideal for control of continuous underbalanced drilling
- Available in a variety of configurations to accommodate virtually all applications
- Meets or exceeds all safety regulations for drilling in H₂S environments
- Two vacuum pumps for increased discharge capacity and redundancy for routine maintenance and repair

Benefits

- Removes virtually all entrained gases, including H₂S and corrosive oxygen, from drilling fluids
- Restores mud to its original density allowing for reuse in the active mud system
- Reduces the threat of dangerous and costly blowouts
- Prevents gas from escaping into the active mud system



Customer-focused, solutions-driven

How It Works

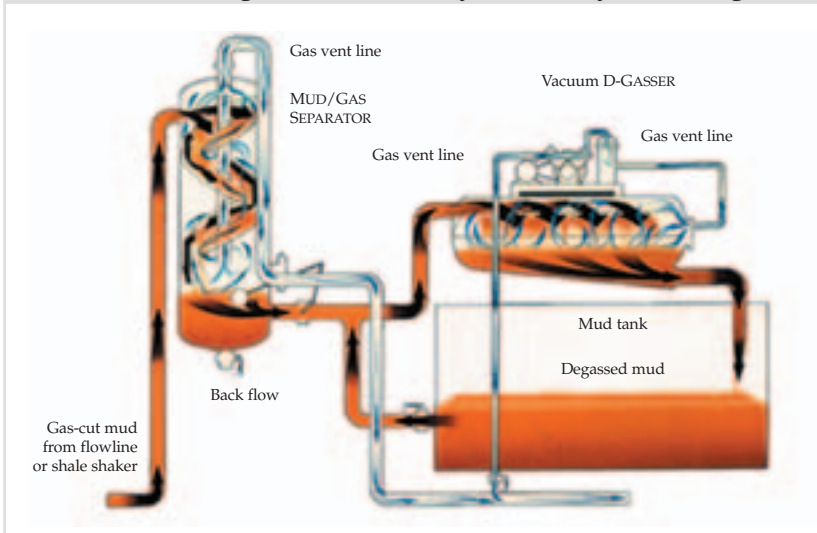
The MUD/GAS SEPARATOR receives mud and gas from the choke manifold or wellhead. The mixture is passed over baffles specially designed to release the gas. The free gas is then carried by the top vent line to a remote flare. A back-pressure valve in the gas exhaust line maintains first-stage separation and prevents mud from entering the flowline. It also reduces the rate of expansion of the gas in the mud stream and moderates the surge effect as gas pockets reach the surface, preventing the mud from blowing out of the gas vent lines.

A float valve in the separator maintains a minimum mud level to provide a liquid seal that prevents gas from escaping into the mud-return line.

The remaining entrained gas and mud are discharged from the bottom of the separator to a modified D-GASSER unit. A float-control valve within the unit maintains a liquid seal to prevent any free gas from being discharged through this opening. The mud from the separator to the D-GASSER unit is joined by the additional mud line from the mud pits through a check valve. The mud from the active system maintains a constant flow to the D-GASSER unit when low flow rates from the separator are encountered. The check valve ensures that no mud from the separator can bypass the D-GASSER unit and accidentally flow into the active system.

Within the D-GASSER unit, the mud is spread over baffle plates freeing the gas. The vacuum removes the gas to the vent line and discharges the fluid back into the active system. A modification of the D-GASSER unit includes two vacuum pumps manifolded together for increased discharge capacity and redundancy for routine maintenance and repair.

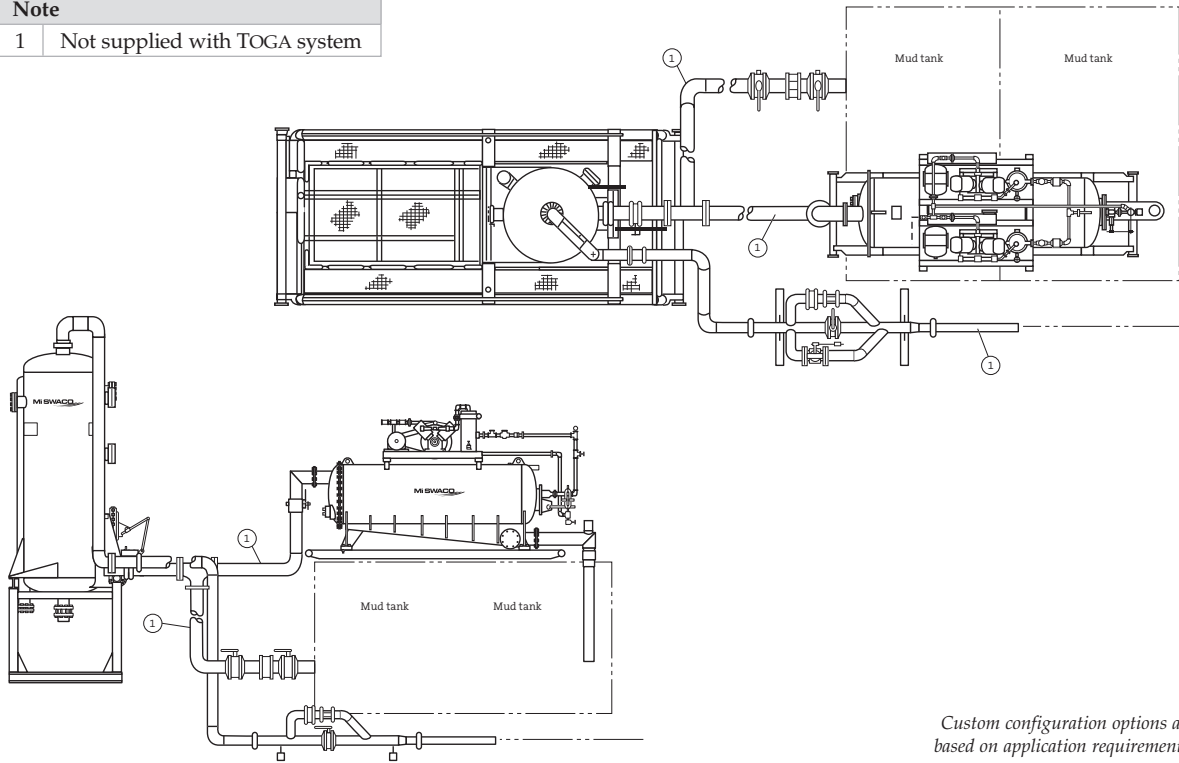
M-I SWACO total-gas-containment system safely vents all gases



Arrangement Drawing: TOGA System (Land Version)

Note

1 Not supplied with TOGA system

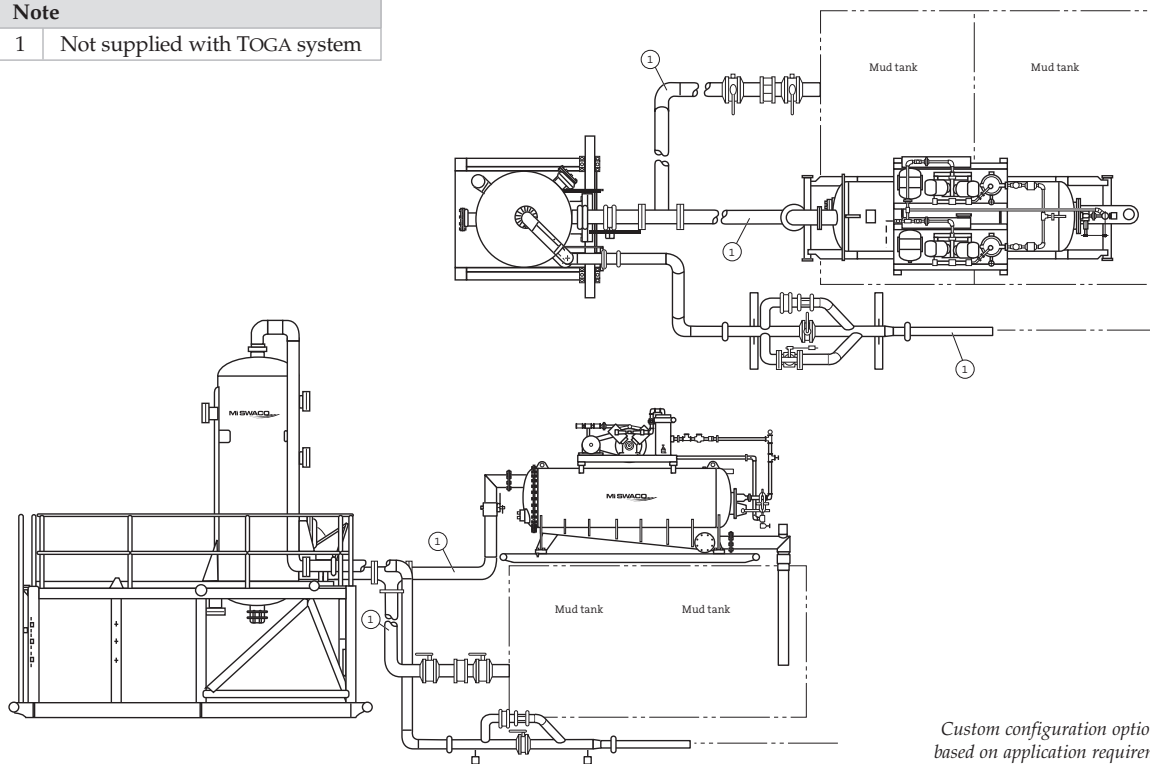


Custom configuration options are based on application requirements.

Arrangement Drawing: TOGA System (Offshore Version)

Note

1 Not supplied with TOGA system



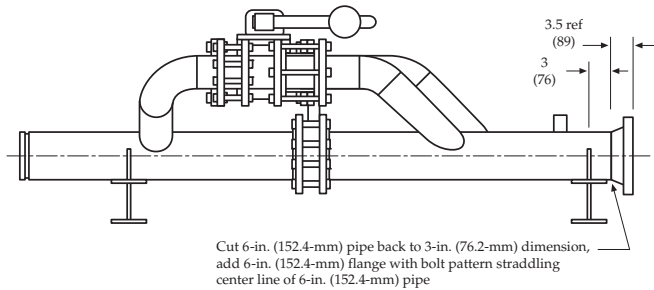
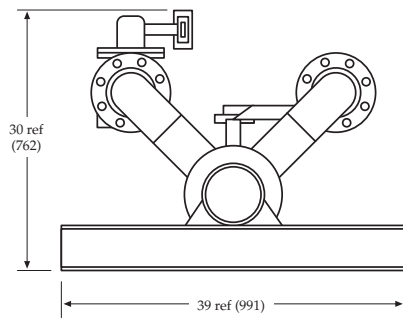
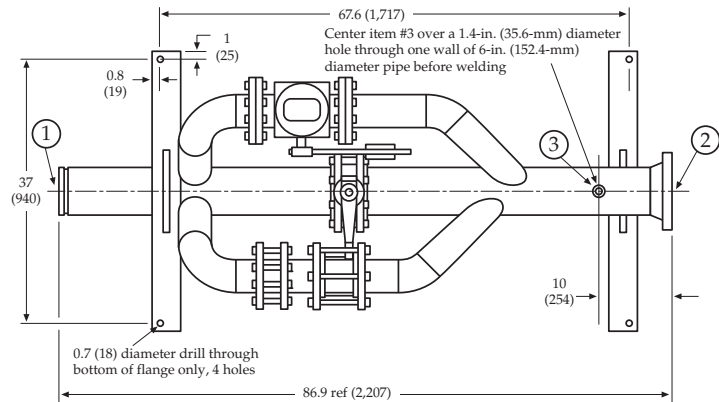
Custom configuration options are based on application requirements.

Arrangement Drawing: Back-Pressure Manifold

All dimensions are expressed in inches (millimeters).

Notes

1	Manifold back-pressure valve
2	Flange-forged steel
3	Coupling



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