POSITIVE PRESSURE
PRODUCTION PACKAGES

Vapour Tight Packages for Sour/Sweet Crude Oil Production and Condensate Stripping Applications

The Clean Harbors Advantage

Efficient

- Packages can be installed and producing on the same day
- All fluid lines are sloped for drainage preventing liquid collection and eliminating freeze-up
- Dump lines are housed in the separator building, preventing freeze-ups and fluid overflows
- Our 428,000 BTU x 10" direct fired U-tube ensures reliable heating and is B149.3 compliant

Cost-Effective

- Packages are bundled together in one truckload, so you save on transportation, installation and tear-out costs
- Third-party integrity program ensures the safety of the rental equipment
- No secondary containment, which is required in Alberta and Saskatchewan (AER Directive 55), provides significant cost savings

Vapour Tight

- Systems are totally sealed and operate on positive pressure
- Storage tank is designed to operate at maximum of 14.7 psi forcing vapour to the flare system automatically
- Storage tanks have high pressure shut-down switches that activate the ESD valve on the inlet to the separator and ensures no vapour loss or oil spills
- Storage tank and separator have high level shutdown switches preventing oil overflows and clean-up costs

Flexible

- Packages operate under a wide range of production conditions
- Tank storage capacities range from 300 bbl to 1,000 bbl
- Different sizes of separators from 285 psi to 1,440 psi are available to handle different flows of production

CleanHarbors®

www.cleanharbors.com

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How it works: A brief operating description

Separation

1. Fluid from the wellhead enters the package.

2. Fluid continues into the vertical separator; there the liquid and vapour separate.

3. Gas goes out the top of the separator, through to the meter run and to the flare.

4. Fluid is dumped to the tank. A kimray valve is used to keep pressure on the separator to allow for easier dumping of the fluid.

Storage

1. The liquid is dumped out of the separator and flows through a line back to the opposite end of the storage tank (the fire tube /weir section).

2. The liquid is released under the fire tube so that it passes the fire tube and is heated before it spills over the weir back to the other end of the tank. This allows all liquid to be uniformly heated.

3. The storage tank is equipped with a stainless steel arm assembly to display the fluid levels on the outside of the tank.

Flare

1. As the gas breaks out of the oil in the storage tank, it passes through a detonation flame arrestor.

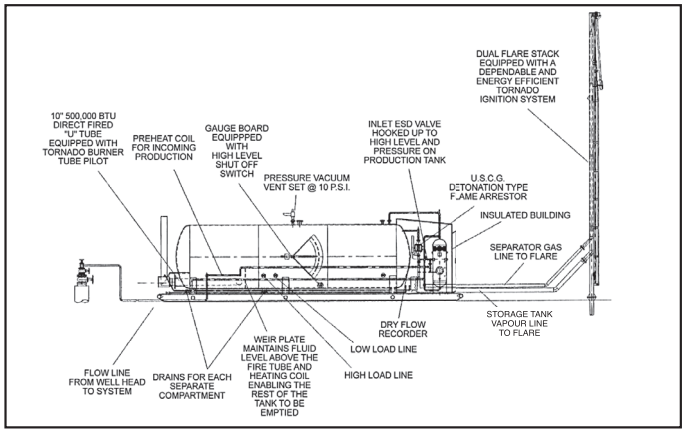
2. The flare gas travels to the stack on a separate line.

3. The waste gas is ignited by an ignitor.

4. Flare gas from the separator passes through a dry flow recorder equipped with a bypass to facilitate orifice changes.

5. The separator gas flows to the stack on its own line through a flame arrestor.

6. The flare stack may be equipped with different types of knockout drums depending on the situation.



Inside the walk-in separator building

Clean Harbors Positive Pressure Production Package

Feature	Benefit
Dump lines to the tank are housed separately	Prevents freeze-ups and fluid overflows and extends life of the dump valve
2" separators drain valve	Easy to swab through
High level shutdown switches on storage tank and separator	Prevents oil overflows and cleanup costs
High pressure shutdown switch on storage tank	Prevents odor problems; the high pressure and high level switches activate ESD valve on the inlet to the separator
All precision equipment is housed in the insulated, steel clad walk-in separator building	Ensures reliable operation in all weather conditions
Sloped fuel lines	Allows drainage and prevents freeze-up
285 - 1440 psi inlet separator at 24" x 60" or greater	Handles production surges easily
Dry flow recorder	Accurate gas measurements
Two flow lines to stack	One line for separator gas and one line for storage tank gases to prevent back pressure in the storage tank under high volume conditions
Detonation flame arrestor mounted inside the building	Prevents freeze-up and plugging
Mechanical gauge board	Accurate fluid measurement

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