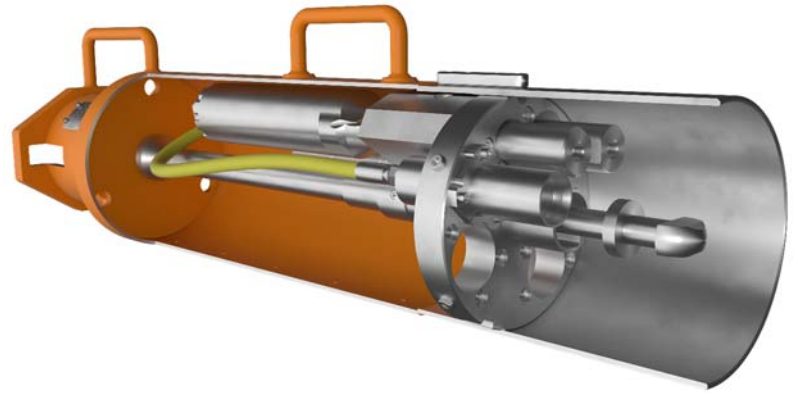




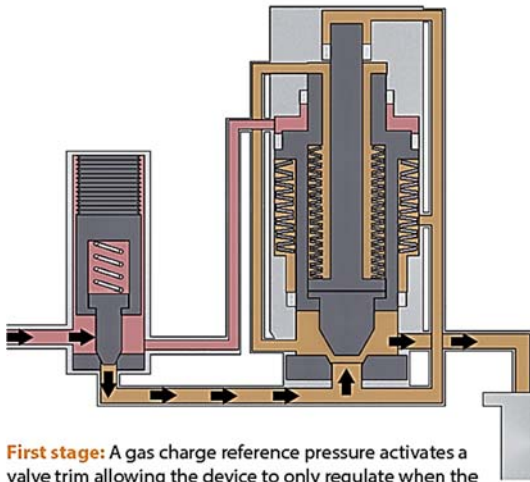
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Unmatched accuracy. Proven reliability.

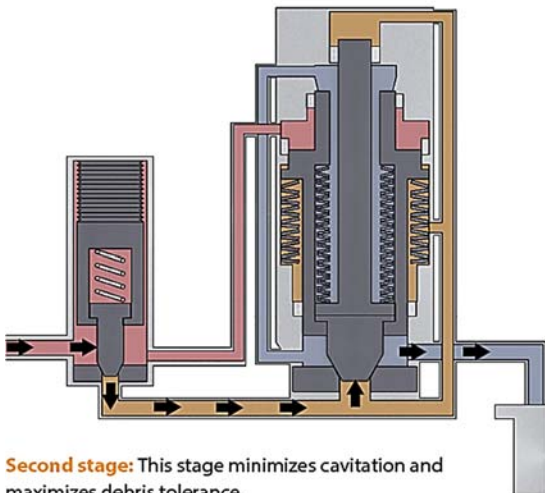


Subsea Back Pressure Regulators

Back pressure regulators (BPRs) intended for subsea deployment are in-line devices that regulate inlet pressure when it falls below a specified set point. Subsea BPRs are typically installed before production flow line injection points to prevent fluids from draining in a non-regulated condition when hydrostatic head exceeds injection point pressure.



First stage: A gas charge reference pressure activates a valve trim allowing the device to only regulate when the injection pressure falls below a set reference pressure. Otherwise, the device remains in the idle stage, which is simply a fixed orifice.



Second stage: This stage minimizes cavitation and maximizes debris tolerance.

Key Features

The Subsea BPR is a self-regulating device activated only when required or needed.

Robust and reliable field proven design that requires minimal maintenance.

The SkoFlo BPR is the most debris tolerant device of its class. It can pass debris levels exceeding SAE 4059 Class 12 while throttling.

Two Stage Device

Cavitation is prevented by separating pressure drops across two stages. Utilizing two stages allows for larger fluid paths, resulting in a higher debris tolerance than in a single stage. This results in longer device life and lower design and operating pressures of topside chemical injection systems.

No Power Required

The Subsea BPR requires no electrical power or communication with a subsea control module.

- Lower installation and operating costs
- Increases reliability
- Compatibility with existing fields

Installation

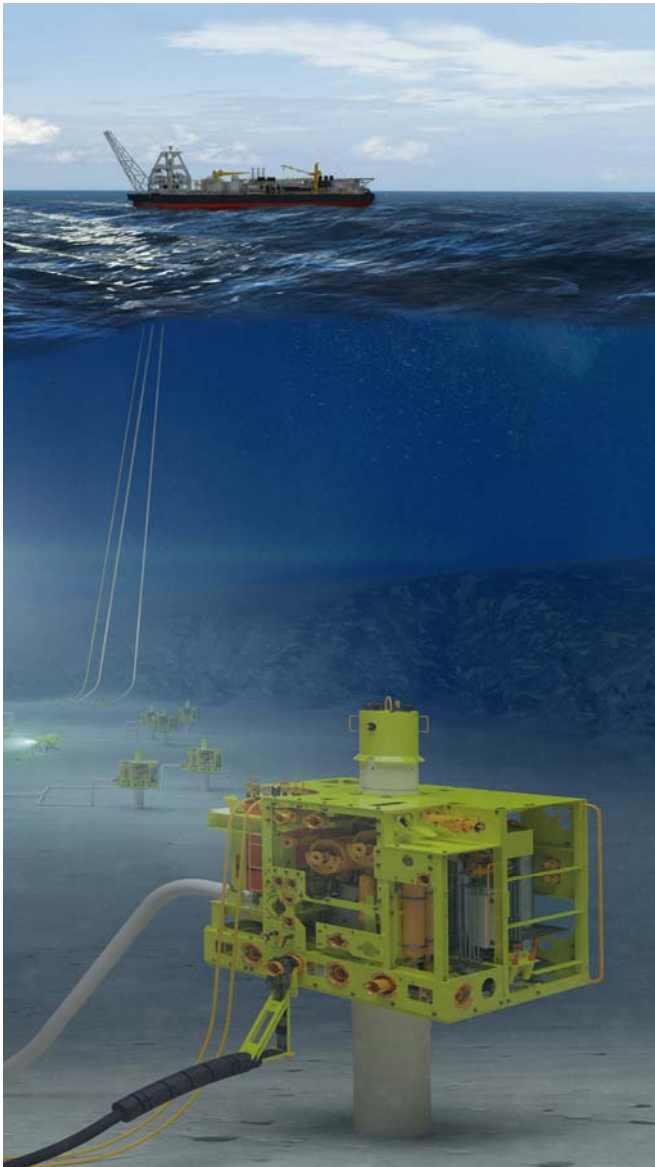
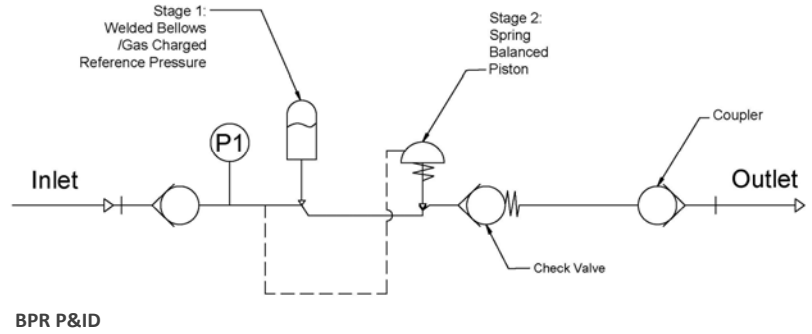
Subsea BPR's can be installed on subsea trees, manifolds, logic caps, and Multi Quick Connect (MQC) plates.

Applications

Anti-Siphoning

SkoFlo Subsea Back Pressure Regulators (BPRs) are anti-siphoning devices that create back pressure in chemical injection lines to prevent uncontrolled delivery of chemicals into production wells.

When the chemical hydrostatic head exceeds injection pressure and the well becomes sub ambient, the subsea BPR prevents fluid from draining into injection points in a non-regulated condition.



New and Existing Fields

BPR's can be used for green or brown fields. For new fields, BPR's can be used for future low well pressures in deep water and typically start service without regulating pressure. For existing fields, BPR's can be used for already depleted wells without interfacing to the subsea control module

This technology enhances and extends the life of a subsea oil or gas well by arresting uncontrolled chemical delivery caused by fluid siphoning. This extends the ability to protect lines for a much longer period.

- Allows corrosion inhibitors to be effectively dispensed, allowing better chemical performance and decreasing the risk of production fluids leaking to the environment
- Reduces the risk of plugging and line abandonment when injecting hydrate, wax, and asphaltene inhibitors
- Minimizing chemical over-dosage to address fluid siphoning reduces overboard treated water emissions
- Allows faster and more frequent pressure testing of chemical injection lines

Deep-Water Low Pressure Well Enablement

When used in combination with downhole check valves in deep wells and deep waters with low formation pressure, SkoFlo BPRs reduce the drop across the downhole check valve.

- Reduced pressure drop allows the downhole check valve to work within the required operating range
- Suppresses boiling in downhole chemical injection line when in combination with downhole check valves.
- Prevents hose collapse due to fluid siphoning during temporary deep-water operations

