

Application:

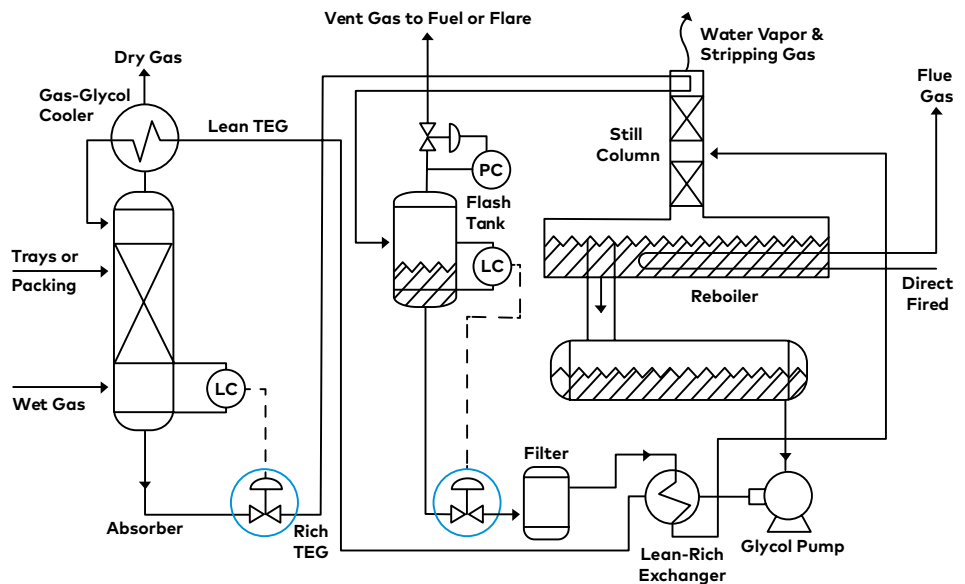
Glycol Dehydration

Location:

Upstream, midstream (e.g. gas storage) and downstream (e.g. gas processing, refineries)

Water must be removed from natural gas before it can be further processed or sent for commercial use. Lean tri-ethylene glycol (TEG) is used to absorb water in the contactor. Valves are located at the bottom of the contactor, and the flash tank.

The challenges of this application can be exacerbated as the plant ages, leading to particles and debris collecting at the bottom of the contactor, which can potentially clog valve trims.



Application challenge	Potential issues	Trim requirement
High differential pressure and low outlet pressure	Cavitation Erosion	Multi-stage
Low Cv	Controllability Gap Cv control	High rangeability Minimised gap Cv
Particles	Erosion Leakage Clogging	Multi-stage Hard material Protected seat Clogging resistant
Sticky fluid	Clogging	Clogging resistant

The EroSolve Metamorphic Trim advantage

Metamorphic Trim (MMT) is a revolutionary valve trim solution that combines multi-stage and cascade technologies to ensure unmatched control at low flow conditions in high pressure drop applications, including a self-cleaning design.

It delivers a uniquely innovative approach to overcoming application challenges, including poor rangeability, effective minimum controllable flow, and valve clogging.



Benefits of this single-valve solution include:

- > Self-cleaning
- > Low-flow control
- > Longer service intervals
- > Protected seat design
- > High rangeability
- > Improved process control

Application:

MEG Injection

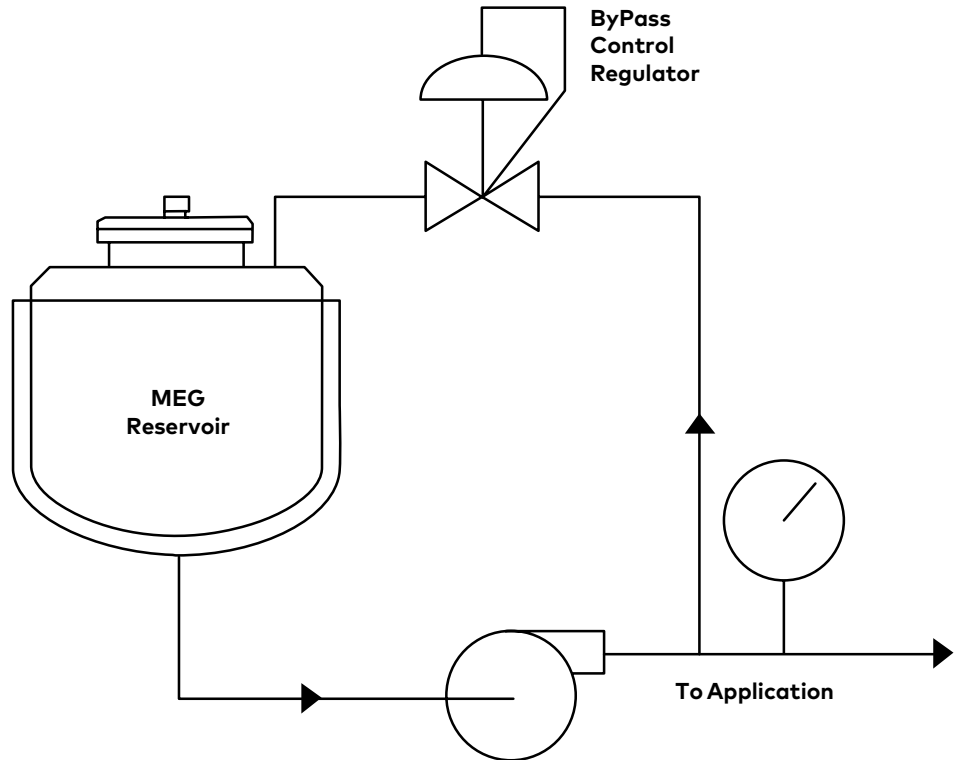
Location:

Upstream oil and gas platforms

Mono-ethylene glycol (MEG) is injected into the well fluid to prevent hydrate formation during the pressure letdown. The MEG pump needs to deliver a high pressure to enable the injection.

The pump recycle valve provides pump protection during start-up, load balancing modulation during different phases of operation, tight shutoff when flow is not required and, most critically, controls the pump outlet pressure to prevent a MEG system trip.

Challenges of this application are a high pressure drop and the ability to control very small Cv values, while there is also a significant risk of cavitation due to the low outlet pressure. High rangeability is required to ensure precise controllability, control the pressure and optimise the injection process, to minimise MEG consumption and avoid a pump trip.



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High rangeability needed	Precise control Pressure control Injection optimisation	High rangeability

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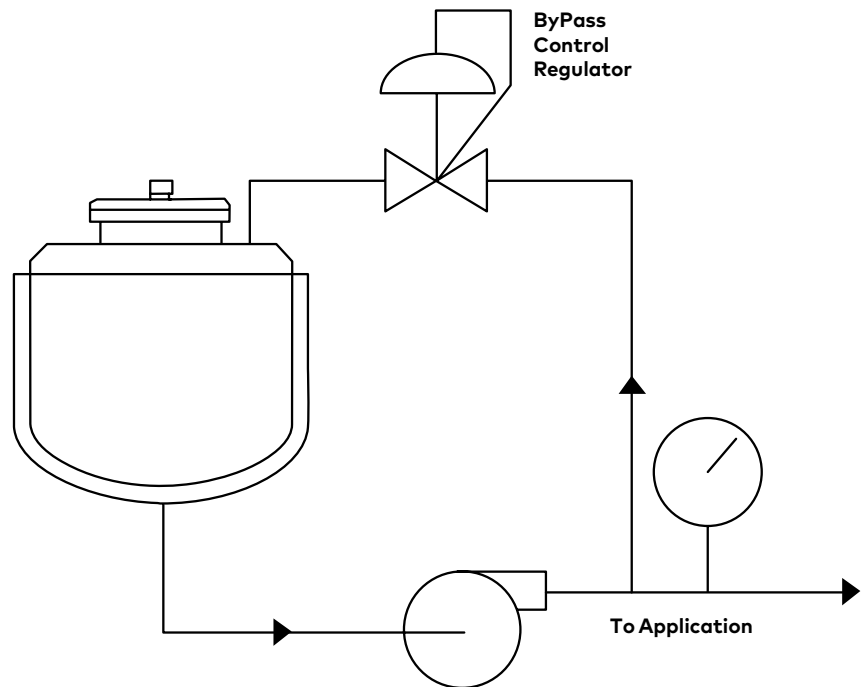
Pump Recirculation and Discharge

Location:

Upstream, midstream, LNG, and downstream
(e.g. water injection, slurry, amine, or feedstock pumps)

The pump recycle valve provides pump protection during start-up, load balancing modulation during different phases of operation, tight shutoff when flow is not required and, most critically, controls the pump outlet pressure to prevent a trip.

The challenges of this application are dependent upon the respective application and pump. High pressure drops and high rangeabilities are common for all. In addition, the fluid can be sticky or contaminated with particles, adding challenges with regards to clogging and erosion.



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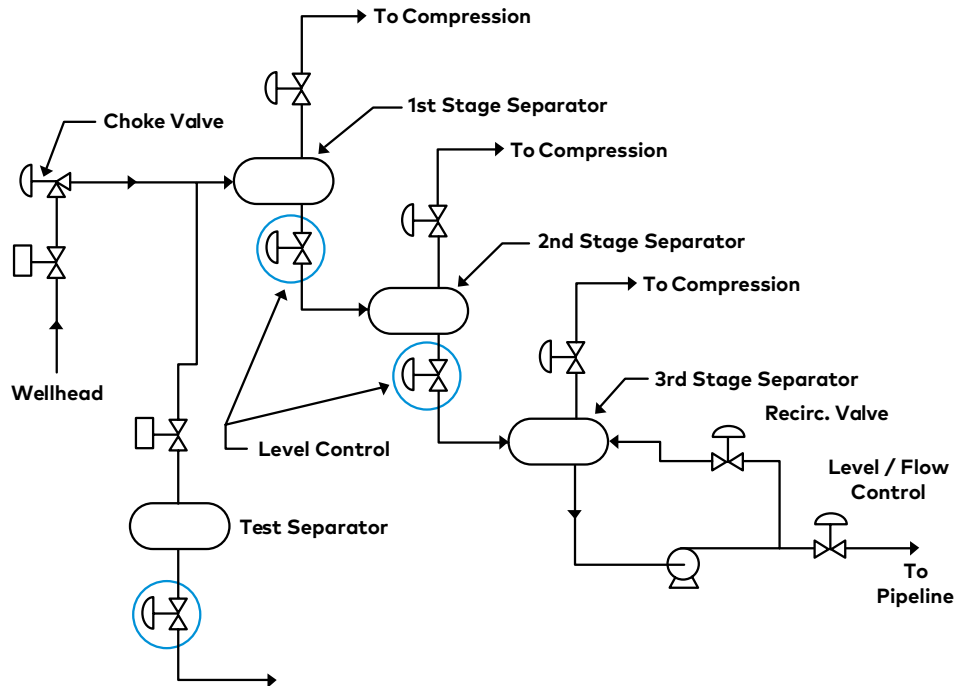
Separator Level Control and Hydrocyclone Letdown Valves

Location:

Oil and gas upstream production, on and offshore

Separator level control valves are used to control the level within the separators, which are static equipment used to separate well fluid by gravity. Typically, this involves several separation stages and a test separator, with valves installed at each stage for both the produced water and liquid hydrocarbon section. These valves often see a high pressure drop and cavitation potential. Also, the produced water and oil condensate can be sticky or contain particles, increasing the risk of clogging, erosion, and leaking in the valves.

The produced water still contains a certain amount of sand, which is removed by hydrocyclones, so particles are, again, a constant hazard for the cyclone letdown valves. As the well ages, the challenge posed by higher levels of particle production increases.



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