

Fisher® Amine Pump Recirculation Solutions



Severe Service



EMERSON
Process Management

Application Discussion

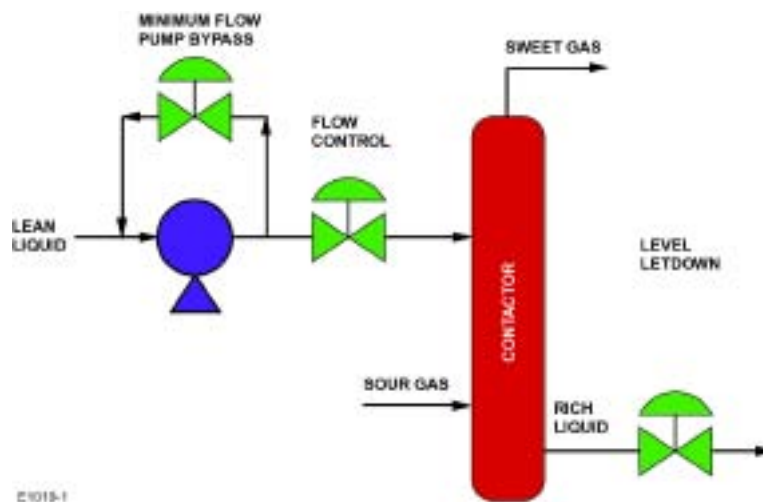
In many refineries and gas processing facilities acid gas removal systems are present to remove corrosive gases. The removal, sometimes referred to as sweetening, occurs in a tower called an absorber or contactor. The absorption process removes the acid gases from the hydrocarbon stream yielding a cleaner product while also protecting critical downstream equipment from damage.

An amine derivative normally is used to remove the acid gases from the hydrocarbon stream. After the acid gases have been removed, the amine is regenerated and pumped back to the top of the absorber to repeat the process.

The amine pumps are a critical asset to a gas processing unit. Each amine pump must be protected from low flow operation and loss of net positive suction head (NPSH), which are conditions that always occur at plant startup and shutdown. At low flow the pump can overheat, and the amine flowing through the pump can separate causing vortices that can cavitate and damage the pump. Protection against overheating and cavitation is gained by recirculating a minimum amount of flow to the pump inlet.

A control valve is used to recirculate a portion of the total pump flow back to a collection reservoir. Because of the high pump outlet pressures and low collection vessel pressures, this valve can be exposed to several challenges.

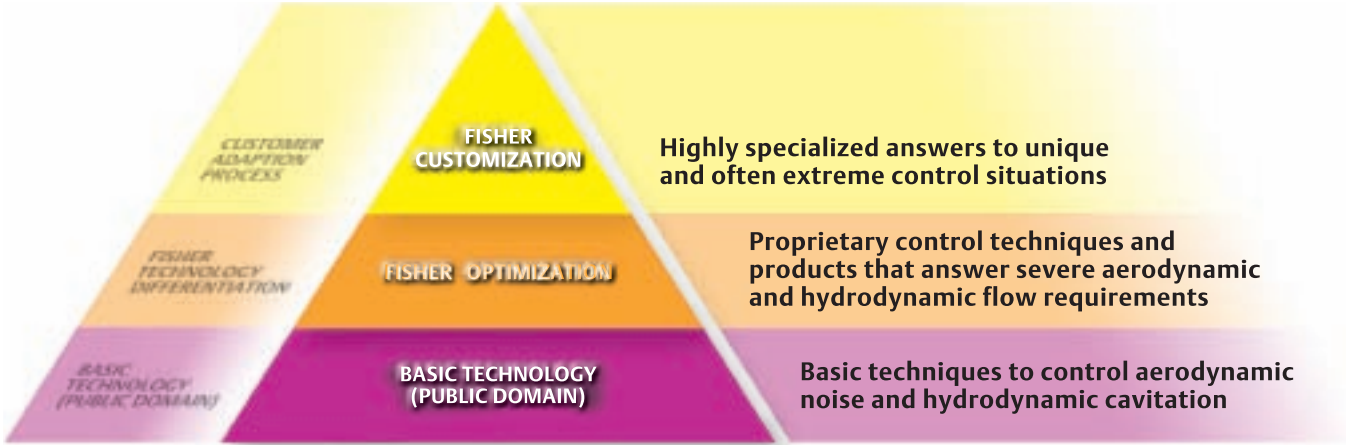
- Improper valve selection can cause cavitation damage to the pump
- Cavitation damage due to high differential pressures across the valve
- Leakage leading to decreased absorber efficiency
- Inadequate seat load to maintain tight shutoff
- Potential plugging during plant startup



The recirculation valve must reduce pressure as high as 1000 psig while avoiding cavitation formation. Cavitation formation is eliminated by unique pressure control of flow through the valve. Also, the recirculation valve is shut during normal operation, at which time tight shutoff (ANSI Class V or greater) is critical. Any leakage results in reduced absorber efficiency along with damage to the valve.

Emerson offers a variety of Fisher control valve solutions that offer protection against cavitation, erosion, plugging, and leakage. Also, to ensure proper operation after installation, a Fisher FIELDVUE® Digital Valve Controller can be used to monitor valve performance. The FIELDVUE DVC provides diagnostic reviews that can be conducted without interrupting the process in order to identify potential performance issues. This helps to ensure proper operation and tight shutoff over the normal service life of the valve.

Severe Service Control Hierarchy



Amine Pump Recirculation – Control Valve Solutions

FISHER CUSTOMIZATION

A large gas plant in Kazakhstan required 16” valves with characterized Dirty Service Trim (DST) to meet capacity needs and to eliminate potential erosion caused by cavitation and entrained particulate. See [D351296X012 at www.Fishersevereservice.com](http://www.Fishersevereservice.com) for additional details.

FISHER OPTIMIZATION

DST Trim



- Patented, multi-stage, anti-cavitation control trim
- Combines axial and radial flow patterns that can pass particulate without plugging
- Features protected seat design that helps avoid clearance flow erosion for long-term shutoff integrity

NotchFlo® Trim



- Utilizes multi-stage, axial flow process to control pressure drop, prevent cavitation and pass entrained particles
- Features protected seat design that helps avoid clearance flow erosion for long-term shutoff integrity
- Offered in a wide range of materials to accommodate specific applications needs

Cavitrol® Trim



- Employs special-shaped orifices and drilled-hole technology in keeping the flowing media above its vapor pressure
- Used in combination with Fisher high-pressure and high-capacity valve bodies to prevent cavitation, achieve tight shutoff and reduce vibration levels

BASIC TECHNOLOGY



- On-off, automated block valve or standard trim control valve with restriction orifice
- Restriction orifice downstream to split the total pressure drop; optimum operation is restricted to one service condition.
- Hardened trim materials to extend service life

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The way you manage your key production assets directly affects your plant's performance and profitability. Emerson's Asset Optimization capabilities deliver world-class services and innovative technologies to increase the availability and performance of mechanical equipment, electrical systems, process equipment, instruments and valves for improved bottom-line results. Asset Optimization helps you improve process availability and attain peak performance, which means wherever you are in your plant's life cycle—startup, maximizing operations or life extension—by relying on Emerson's Asset Optimization capabilities, you'll be on the path to realizing the true potential of your plant's instruments and valves.

The Next Step

Contact your local Emerson Process Management sales office or sales representative location for more information or to make a purchase.

For severe service solutions, see us at www.FisherSevereService.com



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