

Fisher® Deaerator Level Control Solutions



Severe Service



EMERSON
Process Management

Application Discussion

A deaerator removes non-condensable gases that can corrode boiler internals. It does so by heating incoming condensate to the saturation point in order to reduce the solubility of any entrained gases. These are mainly oxygen, carbon dioxide and ammonia that become very corrosive at elevated temperatures.

The deaerator level control valve is used to control level in the deaerator to maximize elimination of entrained gases. Because of condensate pump rangeability, the deaerator level control valve has to control a wide range of process conditions. This valve provides startup and regulating functions in one valve eliminating cumbersome cross over points and easing operation. During initial operation, this valve must address the potential for cavitation formation and provide adequate rangeability to address the entire condensate requirements. Turndowns of at least 75:1 are common.

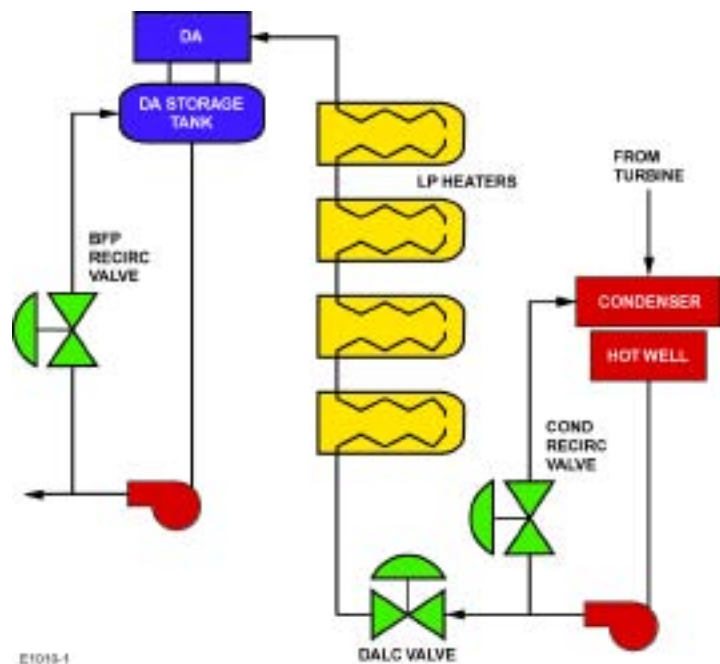
The deaerator level control valve has to provide high rangeability and stable throttling control. However, this valve must be designed to handle other conditions such as:

- Filling of the deaerator prior to plant startup
- Cavitation potential due to high differential pressures at startup
- Maintaining deaerator level during all operating conditions
- Adequate seat load to prevent leakage while the condensate pump is in recirculation mode
- Providing availability for high plant turndown

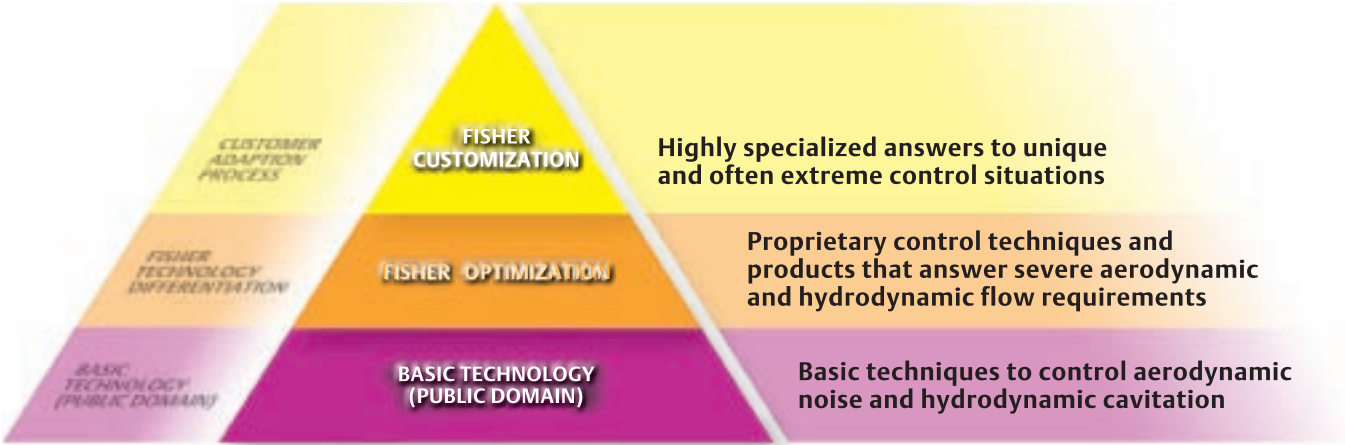
Since the deaerator valve is shut during plant startup, tight shutoff (ANSI Class V or greater) is critical. Any leakage can cause the deaerator level to rise, risking a plant trip during startup along with damaging to the valve.

At startup the valve must reduce pressure as high as 600 psig while avoiding cavitation. The cavitation potential in the deaerator level control valve subsides with the decay in condensate pump pressure. As this occurs and as system capacity demands increase, the valve must affect a smooth transition from anti-cavitation protection to that of providing higher flow rates. It also must provide stable control to maintain load and the turndown required (at times, greater than 75:1) during normal plant operation.

Emerson offers specific Fisher-engineered solutions for the variations encountered in plant design. These solutions provide protection against cavitation, erosion, plugging and leakage while providing the necessary rangeability. Also, to ensure proper operation after valve 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



Deaerator Level – Control Valve Solutions

FISHER CUSTOMIZATION

Lack of control and recurring cavitation damage were constant problems with a combination rotary valve/attenuator, typically requiring costly trim replacement every year. The Fisher solution was a high capacity globe valve with characterized Cavitrol® III, two-stage trim along with the unmatched stem sealing capabilities of ENVIRO-SEAL® packing. See www.Fishersevereservice.com for additional details.

FISHER OPTIMIZATION

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



- Standard trim control valve
- Hardened trim materials to extend service life

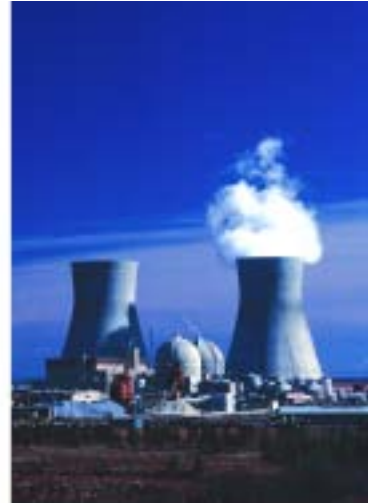
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The Next Step

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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