

Fisher® Turbine Bypass Solutions



Severe Service



Application Discussion

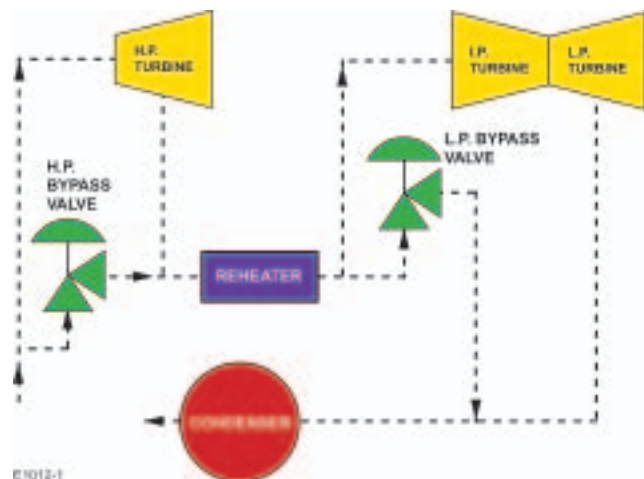
The turbine bypass valves isolate the steam turbine from the boiler during startup, shutdown and load disturbances. This protects the turbine from water carry-over and protects additional plant equipment from large thermal transients. Also, by isolating the boiler and steam turbine it is possible to reduce fuel consumption during startup and shutdown. In the event of a load rejection, reloading times through the turbine bypass system are improved by allowing the boiler to remain online.

The turbine bypass system is designed to provide the quickest startup time by controlling both boiler pressure and temperature. This requires accurate throttling performance to control steam pressure and accurate temperature control to protect downstream equipment by matching conditions normally experienced exiting the turbine. Other critical concerns are:

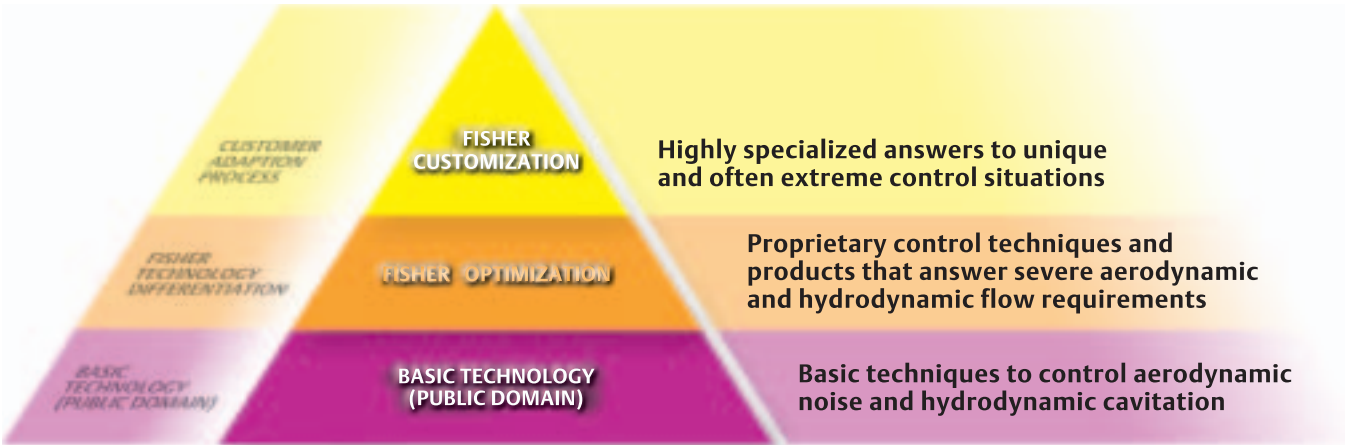
- High pressure differential can lead to noise generation and piping vibration
- Steam temperature control to prevent damage to downstream equipment
- High temperature gradient across the valve
- High temperatures (1065°F) require the use of high-alloy materials and thermally compensated trim designs
- Inadequate seat load can reduce plant load and efficiency while causing valve damage
- Fast opening in case of a plant upset condition

Emerson offers specific Fisher engineered solutions for various turbine bypass designs. Each incorporates accurate throttling and noise control within the valve trim and accurate temperature control within the steam conditioning section. Noise attenuation is accomplished by utilizing unique pressure control of flow through the valve. The specially designed spray nozzles in the steam conditioning section provide accurate temperature control with wide rangeability. Since this valve is closed after startup, tight shutoff (ANSI Class V or greater) is critical as any leakage can reduce unit capacity, increase heat rate and damage the valve trim.

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 ensure proper operation and tight shutoff over the service life of the valve.



Severe Service Control Hierarchy



Turbine Bypass – Control Valve Solutions

FISHER CUSTOMIZATION



A combined cycle power plant installed Fisher TBX valves to address turbine bypass needs. The valve trim and actuation system were specially matched to the startup profile of the facility to minimize startup times and address such critical issues as vibration and shutoff. See [D351138X012](http://www.Fishersevereservice.com) at www.Fishersevereservice.com for additional details.

FISHER OPTIMIZATION

WhisperFlo® Trim



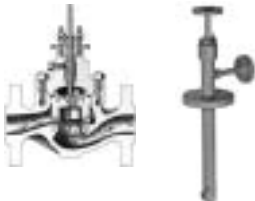
- Incorporates patented, three-dimensional flow path, pressure staging and special passage shapes that uniquely combine to achieve up to a 40 dBA noise reduction
- Provides greater capacity than tortuous path designs
- Can be characterized to meet specific pressure staging, travel and flow requirements

Whisper Trim®



- Utilizes multiple orifices of special shape, size and spacing to achieve noise reductions to 30 dBA
- Process flow-up technique keeps energy sources away from critical trim parts
- Trim parts furnished in hardened materials to extend service life

BASIC TECHNOLOGY



- Standard trim control valve with separate desuperheater
- Restrict operation to limits of standard valve characteristics and standard desuperheater turndown capability
- Tight shutoff construction
- Actuator sized to open valve in less than two seconds
- Noise addressed with path treatments

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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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