Emerson Fisher® EZ-OVT Solution for Continuous Catalytic Regeneration Applications

Application

Continuous catalytic regeneration (CCR) processes with hydrogen and nitrogen purge gas applications

Challenge

- Flow stream particulates and control valve catalyst fines cause trim erosion
- Fast deterioration of control valve shutoff
- Potential plug sticking

Results

- Longer control valve life
- Improved process up time
- Reduced maintenance costs
- Increased running time

Trim Features

- **Dual seat design**
  Fisher® EZ-OVT control valve trim features a dual seat design that includes a primary soft seat and a secondary metal seat. This dual seat design provides for long term ANSI and IEC Class VI shutoff.
- **Off-the-seat deadband**
  A double deadband area is built into the trim to inhibit erosive flow across the seating surfaces as the trim starts to open.
- **Flow deflector**
  A special flow deflector directs the flow stream away from the seating surfaces once the valve has travelled off the seat.
- **Simple design**
  Other than standard sliding-stem plug action, the trim has no moving parts that can become inoperable due to the build-up of flow stream particulate such as catalyst fines.

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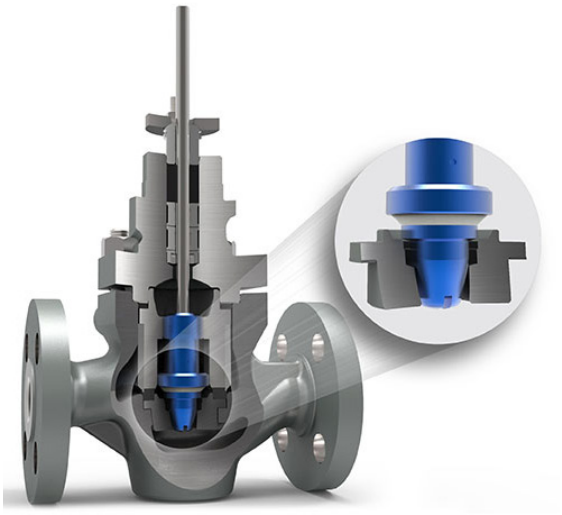

Figure 1. *Type EZ-OVT valve trim shown seated*

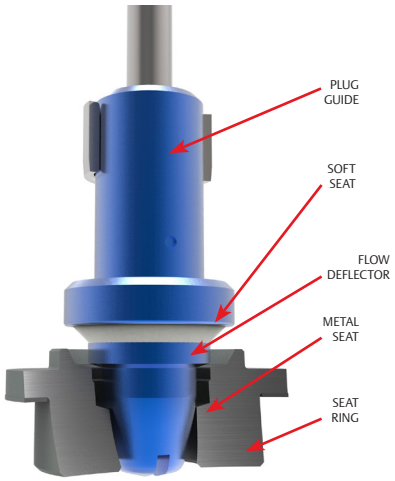

Figure 2. *Type EZ-OVT plug at 20% travel*

Fisher EZ-OVT valve trim is a dual seat valve trim, designed to maintain long term tight shutoff in on-off services that contain particulates in the flow stream such as catalyst fines. An example of this type of service is the valves used to control and purge the hydrogen and nitrogen transfer gases used on the CCR refining process. Control valves for this application must provide bubble tight shutoff to stop the transfer gas flow and be able to maintain this performance, even in the presence of catalyst and their fines. Ordinary single soft seated trim cannot achieve this function due to premature failure.

Principle of Operation

The EZ-OVT valve trim is shown seated in figure 1. When on the seat, the primary shutoff is provided by the soft seat insert. The metal seat provides a secondary seat.

As the plug lifts off the seat, the deadband areas are fully engaged to inhibit flow across the trim seating surfaces.

At 20% travel, the trim is just starting to move out of the deadband areas to allow for flow as shown in figure2.

With the seating surfaces significantly out of the flow path, the tight tolerances between the valve plug and the seat ring open enough to allow flow.

The flow deflector directs the flow stream away from the valve plug seats. The seating surface is completely removed from the flow path, enabling full flow through the trim The flow deflector is continually directing the flow stream away from the valve plug seats.

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