SULFUR RECOVERY
TRICENTRIC® TRIPLE OFFSET

APPLICATION DETAILS

Sulfur dioxide (SO_2) emission levels are restricted by environment and health and safety regulations. These regulations require that sulfur be recovered from H_2S-containing gases such as sour water stripper off-gas and acid gas at a recovery rate that varies depending on the Sulfur Recovery Unit's (SRU) location but is often between 98.5% and 99.9%. The type of sulfur recovery process utilized to meet these regulations is also determined by the H_2S content found in the specific SRU's gas.

The Modified Claus Process is the most commonly used sulfur recovery process. Other common processes include the Amoco Cold Bed Adsorption (CBA) process and Shell's Claus Off-Gas Treating (SCOT) process. The standard Modified Claus Process incorporates an initial thermal reaction stage that removes up to 70% of the sulfur followed by three catalytic reaction stages, each recovers more sulfur. Recovery rates will range between 94% and 99.9% depending on the process used. In some cases, a tail gas cleanup process may be incorporated.

Sulfur recovery processes require triple offset valves to reliably operate as isolation and control valves for acid gas, isolation and control of combustion air, reactor bypass lines, sulfur run down lines, sulfur switching valves, and sulfur tail gas block valves.

APPLICATION CONSIDERATIONS

HIGH CYCLE	High cycling is required for switching valves used in processes such as the CBA SRU Process, MCRC SRU Process, and the SULFREEN Process.
HIGH TEMPERATURE	Valves may need to operate at high temperatures and may be subject to temperature fluctuations.
SULFUR BUILDUP	Sulfur may buildup on sealing and bearing areas due to freezing or crystallization.
DIRTY SERVICE	Dirty service conditions may be present.
TIGHT SHUTOFF	Tight shutoff is required for ensuring efficient SRU performance.
CORROSION	Some areas of the process may be subject to sulphuric acid formation in operation or during shutdown maintenance.
LIMITED MAINTENANCE	Typically valves in this service are required to perform flawlessly for a minimum of five years between maintenance cycles.

TRICENTRIC® TRIPLE OFFSET

The TRICENTRIC® triple offset butterfly valve's non-rubbing, metal to metal, torque seated design, and material selection combine to provide a custom, economical and compact solution to meet the extreme requirements of sulfur recovery applications while delivering high efficiency, reduced downtime, and capital expenditure.

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SULFUR RECOVERY CONFIGURATION

The TRICENTRIC® triple offset butterfly valve can be customized to suit any sulfur recovery application. The below description is an example of a typical configuration.

FEATURES

- Standard materials of construction include A216 WCB body, A216 WCB disc, 17-4 PH DH1150 shaft, weld-on steam jacket
- 316SS and graphite laminated seal ring for tight shutoff—optional upgrade to Duplex 2205/graphite or other materials
- Outboard bearing design option available for dirty service conditions
- Braided graphite bearing seals
- Reduced port valves available for jacketed piping
- Horizontal installation is ideal for triple offset valves used in sulfur service
- All steam jackets, steam-traced shafts and steam-traced discs are tested to 1.5 times the design pressure
- Torque-seated shutoff provides a shear assist for removing sulfur buildup around sealing area
- Design considerations for material selection, dimensional clearances, and tolerances are selected to meet the application temperature range and thermal transients
- Steam jackets are designed to 150 psig or 250 psig at 392°F (200°C) as standard—jackets can be customized to meet customer's requirements

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