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SchuF Gasification Valve Portfolio Overview



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SchuF Valves for Coal Gasification

SchuF has a long history of involvement in coal gasification and liquefaction. The 2nd generation founder of SchuF Dr. Josef Frank wrote his doctoral thesis on Coal Liquefaction at the Technical University of Berlin in 1936.

Since then SchuF has supplied many high quality and finely tuned valves for gasification and liquefaction projects. These include Kohleöl Anlage Bottrop (VEBA), SASOL in South Africa, Shell Gasification process plants worldwide, GE (Eastman and Valero), Shenhua in China and Siemens.

The expertise gained over almost 100 years has resulted in a portfolio of special valves ideal for gasification purposes yet unique in each design. SchuF prides itself on meeting and resolving the new process challenges which each new gasification project brings with it. Some of these challenges are described below.

Dry Feed Gasification Process

In a dry feed gasification process, coal is finely ground and transported to a gasifier by the use of a carrier gas. The flow control of the coal suspended in carrier gas is a critical and complex task for a control valve. The valve must be sized in a way to prevent settling of the coal in the valve, which means maintaining certain minimum speeds of coal flow. However at these speeds, the coal is very abrasive, which means that the choice of material will have to include hard metal parts.

The high solids contents mean that a multi-stage control valve is unsuitable. The abrasion means that a traditional single seat will erode too quickly and therefore a special control disc and seat design is required.

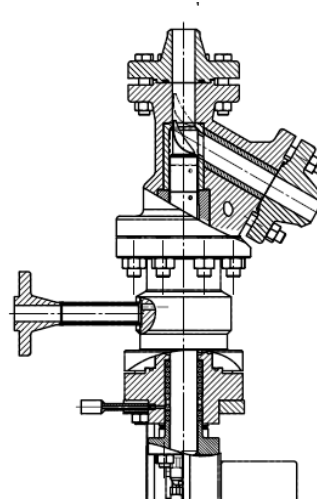
1. Control Valve – Model 74HS

Application: Coal gasification- dry feed

Customer: Yongcheng

Technology: HT-L

Medium: Pulverised coal with CO₂ or nitrogen



The valve model 74HS has a hollow trim design, which is especially designed for applications where a lot of energy needs to be dissipated.

The abrasive flow would cause significant erosion in case of flashing or turbulence. The SchuF design and the special material combination ensures that only easy to replace trim parts wear. For this application only the best suited hard metal materials are used, such as special grain Tungsten Carbide or ceramics.

2. Control Valve – Model 74HS^{PB}

Application: Coal gasification- dry feed

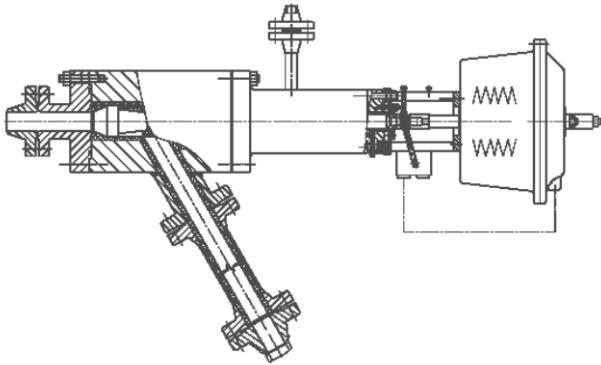
Customer: Shell License

Medium: Pulverised coal with CO₂ or nitrogen

For the Shell process, SchuF has further developed a coal feed control valve to include

many unique features to enhance its performance, while reducing the cost.

The clean air requirements mandate the use of a bellows in the yoke. This bellows in turn must be protected from the very coal that it is meant to seal.



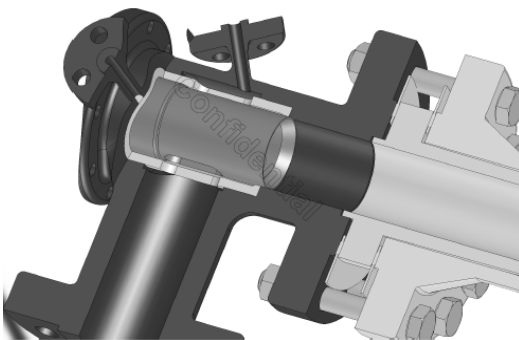
3. Control Valve – Model 74HS^{SC}

Application: coal gasification- dry feed

Customer: Siemens

Medium: Inert gas with gas particles

This valve model 74HS^{SC} has a special designed hollow trim with a unique control contour to allow good controllability over a wide Cv range. The design of this valve allows dissipation of much energy without excessive acceleration. The valve internals are made of special grain Tungsten carbide or Ceramics to withstand the abrasive flow.



SchuF Valves for Black Water Applications

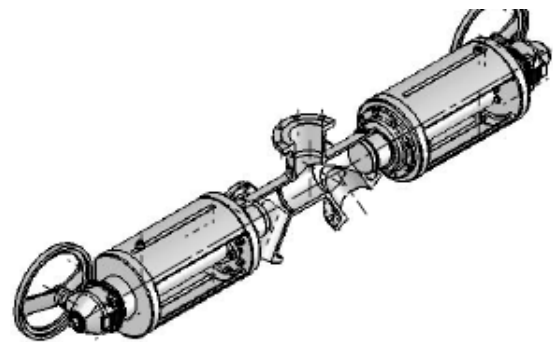
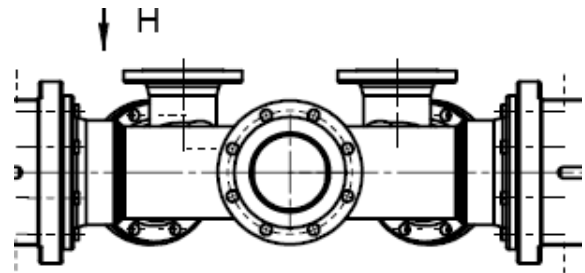
The quenching process in a gasification reactor generates wastewater which must be depressurised and treated for a wide range of contaminants. As part of the gasification process the wastewater treatment system should require little maintenance. Thus the valves need to be dead space free, to avoid any settling out of the suspended solids and a special material combination and valve design is required to overcome the abrasive flow.

A. Diverter Valve – Model 42TK

Application: Coal gasification- black water

Customer: Eastman

Medium: 70% solids coal slurry



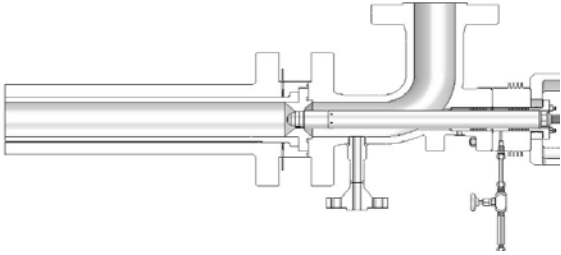
This three way ram model diverter valve is especially designed for the requirements of a coal gasification plant. Thus the sealing surfaces are hard faced and the rams are suitable for throttling service. Each outlet leg is equipped with a flushing port to allow flushing and cleaning of the valve and piping.

B. Control Valve – Model 74CS

Application: Gasification- black water let down

Customer: Valero

Medium: Black Water



During this let down process the black water is depressurised in a flash drum. With the valve model 74CS the black water impinges vertically on a water bed in the flash drum. Thus a lot of energy dissipates and the wear in the flash drum is significantly reduced.

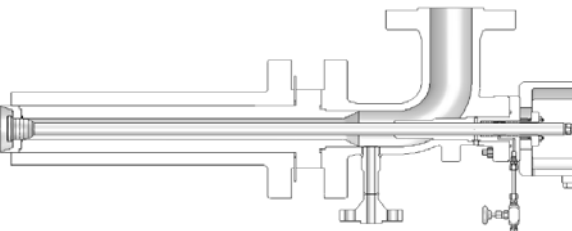
The abrasive flow also causes a lot of erosion in the valve. Thus only Hard-metal materials, like Tungsten Carbide or Ceramics are used for the valve internals.

C. Control Valve – Model 74BS

Application: Gasification- black water let down

Customer: Valero

Medium: Black Water



The angle control valve model 74BS is especially designed to inject the medium below the water level in the flash drum. The valve is supplied with a funnel from the valve into the flash drum. Body & funnel have a continuously accelerating design to prevent flashing before the fluid leaves the valve. Furthermore the funnel reduces the pressure in the valve just before the disc/seat and allows the plug to open further and reduces the exit velocity. The prevention of flashing and the reduced exit velocity reduce the wear in the valve and in the flash drum significantly.

Customer References

SchuF has delivered over one million valves and includes the following companies among its customers:

ABB, Alcan, BASF, Bayer, BP, Chevron, Dalian Refinery, Degussa, DuPont, Exxon, Formosa Plastics, GE, Hoechst, Hyundai, Inventa Fischer, Jordan Phosphate, Kohle Öl Bottrop, Lurgi, Merck, OPC, Petrobras, Pfizer, Pemex, Reliance, Roche, Schering, Shell, Shenhua, Sinopec, Temex, Uhde and Yisheng

SchuF's success has been built on its ability to design and manufacture high performance valves to match customer requirements, to create industry standards, and to redesign them as end user requirements change.