Let down, Venting, Pump recirc. & Temp. control

Type 74

REFINERY / HYDRO- AND RESID CRACKER CONTROL VALVE APPLICATIONS

In any refinery, the first process step is the Top Distillation unit. Under atmospheric pressure, the crude oil is distilled and separated into its natural fractions i.e. C_1 to C_5 gases, Gasoline, Jet, Middle Distillates/Diesel and Atmospheric Gas Oil. Usually, the atmospheric residues will be further treated in a Vacuum Distillation unit to increase the yield of liquid hydrocarbons, i. e. Light and Heavy Vacuum Gas Oil.

The Gas Oil Fractions from the atmospheric and the vacuum distillation can be further utilised in a Hydrocracker Unit, through which high value products may be derived. Similarly in a "Resid Cracker" residues can be processed under similar conditions but using much more Hydrogen.

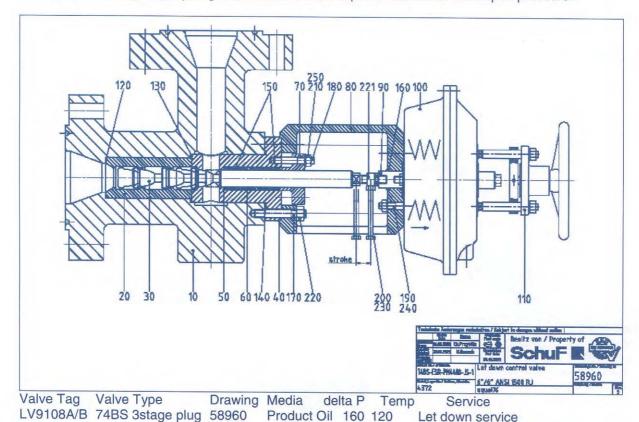
In a Cracker, the Gas Oil or residue feed is cracked in the presence of a catalyst and hydrogen which is added under high temperature and elevated pressure (> 100 bar), and converted by cracking and hydrogenation. The converted hydrocarbon fractions derived are Heavy Naphtha, Jet Fuel and Middle Distillates for the most part.

The Unconverted Oil (UCO) is separated from the converted products in the High Pressure Hot Separator and leaves the separator at the bottom outlet.

A. Control valves for let down service and emergency venting to flare

The UCO is depressurised through a multi-stage control valve in which the vapour fraction of the UCO flashes out immediately according to its physical properties. This valve may have inlet conditions of 100°C / 100~200 bar if there is a cooler before the HPS. It is normally used to control level of the HP separator.

In case of an emergency, hydrogen is vented to flare to prevent a critical build up of pressure.

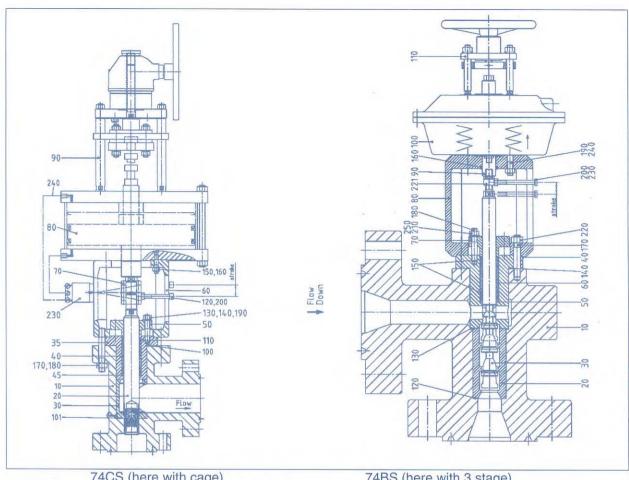


SchuF-Chemieventile Vertriebs GmbH & Co. KG An der Guldenmühle 8-10 D 65817 Eppstein/Frankfurt Telefax 0049-6198-571200 · Telefon 0049-6198-571100 · www.schuf.de



Let down, Venting, Pump recirc. & Temp. control

Type 74



74CS (here with cage)

Valve Tag

Valve Type

Drawing Media delta P Temp

Service

HV9101

74CS Cage plug

58746

Hydrogen

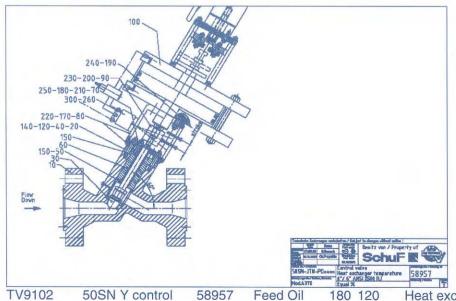
160

130

Emergency venting to flare

LV9104A/B 74BS 3stage plug 58959 Product Oil 160 120 Let down service

B. Heat Exchanger



TV9102 50SN Y control 58957 Feed Oil 180 120 Heat exchanger temp. control

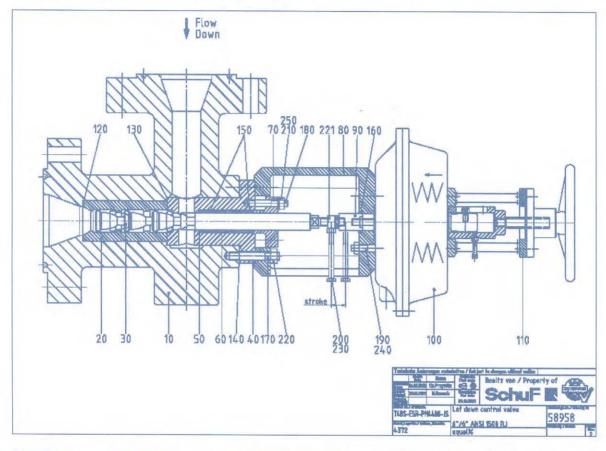


Let down, Venting, Pump recirc. & Temp. control

Type 74

C. HP Booster Pump Recirculation

Another application is for high pressure booster pump recirculation control. During start-up these pumps may not run dry, so the these valves allow the pump to run a "closed loop". Therefore the valve will have to dissipate the complete pressure built up by the booster pump. Once start up is completed the valve is closed. Tight shutoff is required in this case.



FV9103/4

74BS 3stage plug

58958 Feed Oil

220 120

Pump recirculation

To prove itself in this market, SchuF has delivered the valves above to the more difficult service of a residue cracker in Shanghai refinery. Our valves have been in trouble free use for the last two years. Our Kommision for Shanghai Refinery is 62517 / 2003. We have also recently received an order for these valves from Dalian Refinery (Komm Nr. 64390 / 2005) for a Hydrocracker.

In these applications our valves are often flow to open. This differentiates our valves from our competitors (Masoneilan / Fisher) which are flow to close. The advantage of a flow to open valve is that there is less tendency to plug up, which is good if the feedstock is dirty i.e. for a residue cracker. For cleaner fluids, or in case of customer preference we can also supply flow to close versions (the advantage here being the use of smaller actuators).

Hydro- and residuecracker HHPS let down service is easier than for heavy oil or coal hydrogenation, as the Hydrocracker does not normally see any solids while the residue cracker sees less. In contrast to heavy oil hydrogenation, it is the gas oils that are feed into the Hydrocracker, not the very heavy distillate residues. SchuF also delivers control valves for this services, with solid Tungsten Carbide trims and single seats.



Let down, Venting, Pump recirc. & Temp. control

Type 74

Product Bulletin March 2004

3-Stage Plug Trim

Specifications

Available Valves

Model 74BS Angle Valve with inlet angle of 90, 60 or 45 degree.

End Connection Styles

- · Class 600, 900, 1500 and 2500
- · Butt weld ends
- · Flanged ends in RF, RTJ, LR or LM/LF style

Shutoff Classifications

Class V or VI per ANSI/FCS 70-2 and IEC 60534-4

Maximum Inlet Pressures and Temperatures

Consistent with applicable Class 600/900/1500/2500 pressure/temperature ratings according to ASME B16.34

Construction Materials

Body/Bonnet:

WCB, WC6, WC9, Cr-Mo Steel CF3M, CF3, CF8M, CF8, CF8C Duplex SST

Valve Plug/Stem (integral):

- 420 SST
- 316 SST
- 316 L SST
- **321 SST**
- SAF 2205

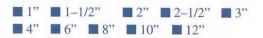
Seat

- 316 SST
- 316 L SST
- 321 SST
- **329 SST**

Yoke

■ 304 SST

Valve Size



Flow Coefficients

1 to 750 depending on seat size

Flow Characteristics

Linear or equal percentage

Flow Direction

- · Flow down
- · Flow to open or flow to close

Actuator Selection

- Model PM Multi-Spring Diaphragm Actuator in 304 SST or Aluminum casing
- Model PKD Double-Acting Cylinder Actuator in steel casing
- Model PKE Single-Acting Cylinder Actuator in steel casing
- Anti-rotation device as standard

Positioner Selection

Siemens Model PS2 Smart Positioner or SMC I/P Positioner (product bulletin on request)

