



FDV Valve

For deodorization and physical refining of fats and oils

Application

The Alfa Laval FDV Valve is designed for internal installation at the bottom of deodorization column trays. The valve is actuated by steam and is specially designed to allow rapid draining during stock changes and shutdowns. The contents of a single tray can be drained in 1-3 minutes.

The FDV Valve is a part of the Alfa Laval SoftColumn™ deodorizing concept, but is also available as a retrofit component for other deodorizers - irrespective of make.

Operating principles

The FDV Valve consists of a valve body with a large opening and integrated seat, a horizontal disc that seals against the valve seat and an actuator installed vertically under the valve body and directly connected to the valve disc by a vertical shaft. The actuator is a double action type, using steam to move the disc up and down, i.e. to open or close the valve. The steam is injected in one side of the actuator while the other side is connected to the vacuum. Two pipes leading through welded connections in the deodorizer wall provide the steam and vacuum supply.

A control box with automatically actuated ball valves for steam and vacuum is located outside the deodorizer and is connected to the FDV Valve pipes.

To open the valve, the lower chamber of the actuator is pressurized by steam, and the upper chamber is connected to the vacuum. The resulting pressure differential causes the valve disc to move rapidly upwards, thus exposing the large opening and allowing for rapid draining of the tray.

To close the valve, the steam is applied to the top chamber of the actuator, while the lower chamber is evacuated. The valve disc then quickly moves downwards and seals against the valve seat.

Design features

The FDV Valve is designed for installation inside the deodorizer, and is assembled directly on the bottom of the tray. This mounting permits the fastest possible draining of the trays during stock change and shutdown. The wide, unrestricted opening of the disc allows for a high liquid flow rate.

Sealing is ensured by a metallic E seal, assembled in the flat disc and acting against the valve seat. When the valve is closed, the liquid level exerts pressure on the disc, creating a hydrostatic seal against the valve seat.

The valve seal consists of a resilient metal convolution in a "floating" mount (pat. pending) that keeps it free from tension. The surfaces are ground and lapped. This seal can withstand high temperatures and exerts a high sealing pressure. It can also



FDV Valve model 303 in open position

withstand many cycles due to the low-strain elastic deformation. The valve seat is flat and aligned to the bottom of the tray to allow full draining with no liquid pocket.

The valve is attached to the bottom of the tray by a flange, so it is easy to install. It is also easy to service and maintain, with access only necessary from above.

An important feature of the Alfa Laval FDV Valve is the internal actuator, which uses steam as the pressure medium. This means that there are no external actuators, shafts or sealing glands, all of which can cause air leakage to the inside of a deodorizer.

The valve is designed for heavy-duty operation in continuously running process environments.

It requires little maintenance attention because there are few wearing parts. A complete overhaul therefore only involves replacing few wear rings and seals. Recommended overhaul is at 100.000 cycles, or 3 years of operation, whichever comes first.

A full set of seals and wearing parts, with tools included, is available as a complete service kit.

An Alfa Laval FDV Valve can be installed in deodorization columns of varying diameters because the valve is seated in a valve ring designed to adapt to the required column tray thickness, while the valve seating remains the same. The valve ring is then welded inside the column, thus forming the bottom of the tray.

Each valve is supplied with a pre-assembled control box. Actuated ball valves are used for steam and vacuum. These valves are prepared for manual operation if this should be needed.



FDV Valve model 303 in closed position

Technical specifications

Operating temperature: up to 275°C (530°F)
 Actuation pressure: 2 to 5 barg (58 to 87 psig)
 Steam or N₂ consumption:
 0.8 liters (0.21 gallon) to open and 0.7 liters (0.18 gallon) to close
 Material: AISI 316

Dimensions and weights, approximate

Valve model	D, mm (inches)	H1, mm (inches)	H2, mm (inches)	Weight, kg (lb)
303	396 (16)	331 (13)	100 (4)	35 77

Control box	W, mm (inches)	L, mm (inches)	D, mm (inches)	Weight, kg (lb)
	305 (12)	405 (16)	200 (8)	10 (22)

Control box

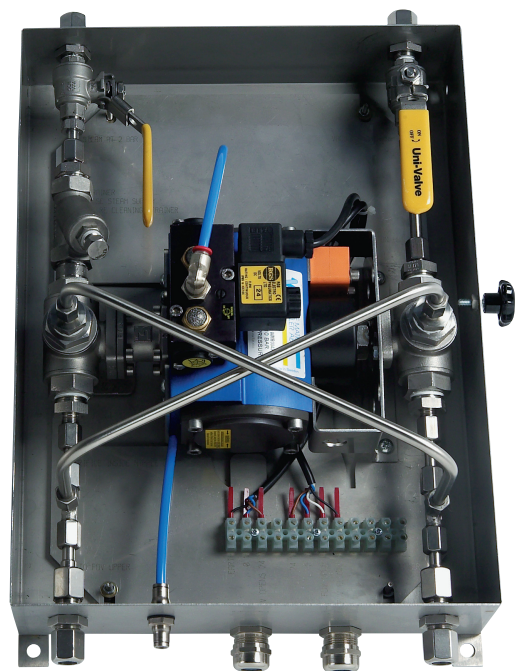
The control box is necessary to guide the steam that controls the FDV Valve. This box contains a pneumatic actuator and two 3-way large-bore steam valves. This avoids any risk of an insufficient supply of steam as well as ensuring that there is ample power to open and close the valve.

A strainer (mesh 100) is fitted to prevent dirt and grit from entering and causing wear or damage.

Manual overrides (both pneumatic and mechanical) are possible if the control system should fail. The tools for this are attached inside the control box.

A position indicator is fitted as standard.

Service and maintenance are easy due to the use of special fittings and shut-off valves. If service is needed, it takes short time to replace the entire base plate of the control box.



How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com