Optimise your Aseptic Performance

AMP Aseptic Mixproof Valve

Application

AMP is an aseptic double seat valve with stainless steel bellows, designed for mix-proof operation when two different products flow through only one valve.

The spillage free valve plug design with an integrated sterile barrier between the two plug seals ensures a safe separation of the media and make the valve suited for the most demanding aseptic applications.

A compact and integrated valve design ease engineering, installation, operation and maintenance.

Fig.1. AMP Aseptic Mixproof Valve.

Working principle

The AMP mixproof valve is operated by means of compressed air. The valve is a normally closed (NC) valve. All valve positions can be monitored by the Alfa Laval ThinkTop and one external sensor. To ensure proper sterilisation of the barrier chamber, the external condensate valve must be controlled by a temperature sensor.

The figures 2.a to 2.f show the individual valve positions and functions.

Closed valve (fig. 2.a.)

The sterile barrier is active. The barrier chamber is filled with saturated steam or condensate for safe and sterile separation of the two product lines. Steam consumption and heating of the product is low due to the closed external condensate valve.

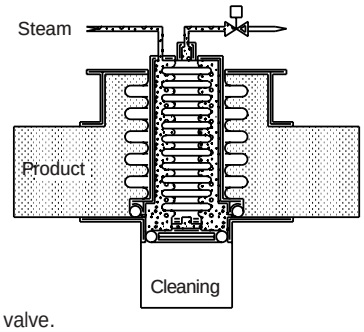

Fig.2.a. Closed valve.

Lower and upper seat cleaning (fig. 2.b. and 2.c.)

Condensate and steam is flushed out of the barrier chamber through the slightly lifted valve plugs to ensure proper cleaning and sterilisation of the plug seal surfaces. The external condensate valve is closed.

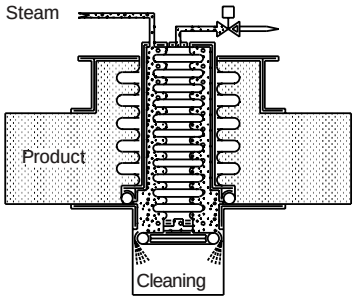

Fig.2.b. Lower seat cleaning.

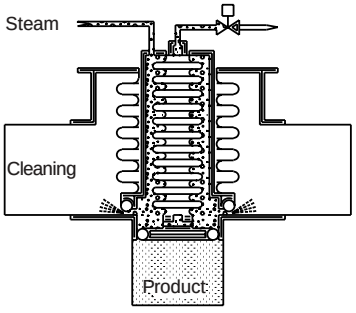

Fig.2.c. Upper seat cleaning.

3.2

Barrier chamber sterilization (fig. 2.d)

The AMP valve is in closed position and the external condensate valve is open. Possible condensate is drained out with the steam pressure over the external steam valve and the condensate drain. The barrier chamber is heated and cleaned with the following saturated steam.

Intermediate position (short stop) (fig. 2.e)

The sterile barrier between the two plug seals is inactive and the two product lines are separated only by the upper valve plug seal. With this simple cut off function a sterilisation of the barrier chamber can be avoided in case of a short production break. The external condensate valve is closed.

For maximum safety the valve must be in intermediate position for a few seconds before being opened and air pressure should be connected to AC2 also when the valve is open.

Open valve (fig. 2.f)

The two product lines are connected. The external condensate valve is closed.

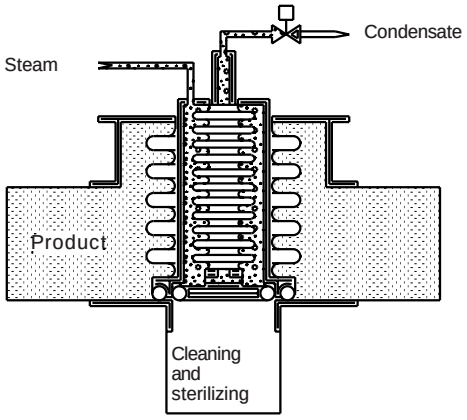

Fig.2.d. Barrier chamber sterilization.

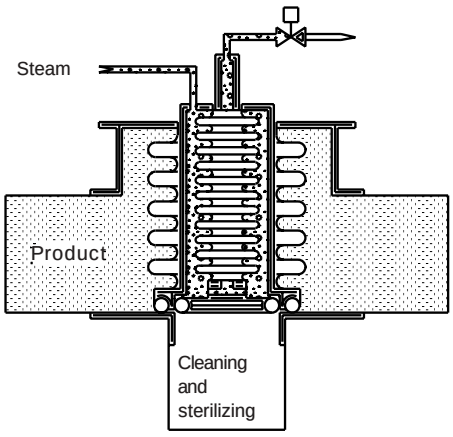

Fig.2.e. Intermediate position.

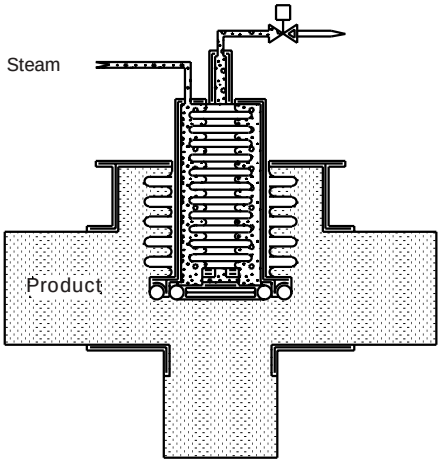

Fig.2.f. Open valve.

Standard design

The valve consists of air actuator, bonnet, valve plug and a valve body. The valve is a assembled by means of a clamp ring system for easy maintenance. All seals and bellows are replaceable. Steam- and condensate connection hoses are included as standard.The external steam and condensate valves, steam trap and temperature sensor are not included.

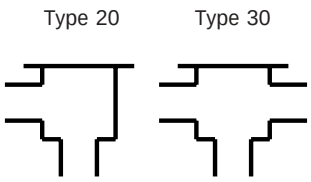

Fig.3. Valve combinations, type 20 and type 30.

Dimensions:

Size DIN-Inch	DIN DN 50	DIN DN 65	Inch DN/OD 51 (2")	Inch DN/OD 63.5 (2½")
A1 (valve closed)	480	503	480	503
A2 (valve open)	492	519	492	519
B	60	69	60	66
B mix-size	69		66	
C	190	190	190	190
OD_1	52	70	50.8	63.5
ID_1	49	66	47.6	60.3
t_1	1.5	2	1.6	1.6
OD_2	52	70	50.8	63.5
ID_2	49	66	47.6	60.3
t_2	1.5	2	1.6	1.6
F	140	140	140	140
Stroke (S)	12	16	12	16
Kva open valve (m^3/h)	47	66	45	66
Kvb upper body (m^3/h)	44	61	43	56
Weight (kg)	23	24	23	24

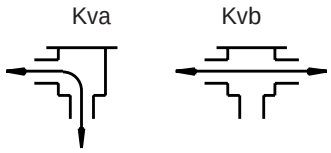

Fig.4. Pressure drops.

Air connections

AC1: Cleaning of upper seat.
AC2: Intermediate position (short stop).
AC3: Open valve.
AC4: Cleaning of lower seat.

Steam- and Condensate connections

SC (Steam Connection) ø12/10
CC (Condensate Connection) ø12/10

Formula to estimate pressure drop over valve
(for liquids with viscosity and density comparable to water):

$$\Delta p = \left(\frac{Q}{K_V}\right)^2$$

Δp = pressure drop [bar]
Q = flow rate [m^3/h]
K_V = flow coefficient from above table [m^3/h at Δp = 1 bar]

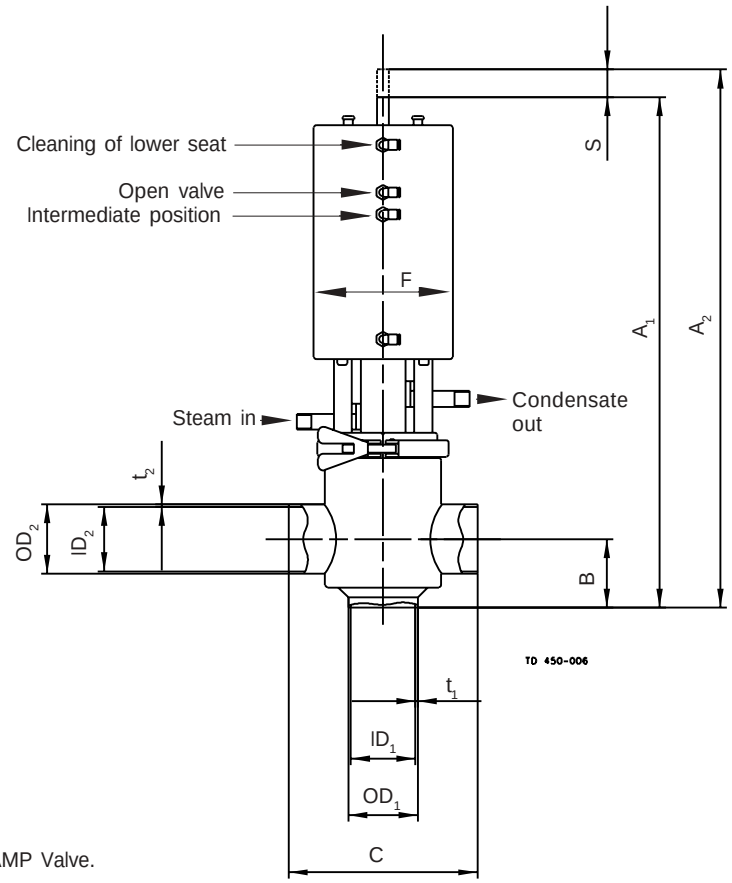

Fig.5. Dimensions, AMP Valve.

Technical data

Product pressure:	- Max.	600 kPa (6 bar)
	- Recommended	Lower than steam pressure
Steam pressure:	- Max.	400 kPa (4 bar) saturated steam, 152°C
	- Recommended	300 kPa (3 bar), 144°C
Steam consumption:	- Barrier chamber sterilization	4-8 kg/h
	- Seat cleaning	35-40 kg/h
Air pressure:	- 600-800 kPa (6-8 bar) dry and free from oil	
	- Air consumption approx. 1 NL per operation	
Expected life time:	- Steel bellows*	200,000 strokes or 3 years
	- Product seals	4,000 strokes or 6 months
	- Actuator seals	200,000 strokes or 3 years

*: Under normal conditions – no pressure shocks or cavitation

Materials

Product wetted steel parts	Acid resistant steel 1.4404/1.4435 (316L/ 316Ti)
Other steel parts	Stainless steel 1.4301 (304)
Surface quality, product wetted surfaces	Ra ≤ 0.8 µm
Product wetted seals	EPDM
Other seals	EPDM

Options

A) *Think*Top®
B) Male parts or clamp ends in accordance with required standard.
C) Feedback sensor and bracket for upper seat lift detection.
D) Special valve port connection sizes (mixed sizes - 51mm/valve with 63.8mm/DN 65 horizontal port connections).
E) 3A (Sanitary Standard) labelling on request.
F) Tool for valve plug maintenance.

Ordering

When ordering please state the following:
- Valve type.
- Size (mixed sizes).
- Connections, if not welding ends.
- Other options

Note! For further details, please see operating manual IM70833.