Alfa Laval Unique SSV Pressure Relief Valve

Single seat valves

Introduction

Protect your hygienic processing lines—especially those with positive displacement pumps—with the Alfa Laval Unique SSV Pressure Relief Valve. Preventing overpressure safeguards efficiency, productivity and product safety. Customize this compact, modular valve, built on the proven Unique SSV platform, to meet your requirements. Equip this overflow valve with Alfa Laval ThinkTop technology for valve monitoring and control, while safeguarding process efficiency, productivity and safety.

Application

The Unique SSV Pressure Relief Valve is designed for use in a broad range of hygienic applications across the dairy, food, beverage and many other industries.

Benefits

Reliable pressure relief valve for your hygienic processing lines

- Keeps pressure within safe operating limits
- Ensures reliable performance with flexible, on-site setup
- Enhances efficiency and product safety through validated cleaning
- Ensures compliance with hygienic or aseptic process requirements
- Enables easy settings adjustment for precise pressure control and process safety

Safeguard your hygienic equipment from overpressure with the Alfa Laval Unique SSV Pressure Relief Valve. This adjustable PRV provides precise pressure control to maximize uptime, even in dynamic environments, making it ideal for the dairy, food, beverage, and home and personal care industries.

When powered by Alfa Laval ThinkTop technology, it proactively detects issues, ensures process and product safety, and seamlessly adapts to various operating conditions. It is fully CIP-able, no matter the pressure setting. Spare parts are interchangeable with other Unique SSV valves, simplifying maintenance and reducing service time, inventory and administration costs.

Boost efficiency while safeguarding your processing lines with the Unique SSV Pressure Relief Valve.



Standard design

The Unique SSV Pressure Relief Valve is available in two pressure rating versions: PN10 and PN16. Available configurations depend on the selected PN version. The valve is available in a one-or two-body configuration, and it is easy-to-configure the valve to match a specific need. The valve can be configured in a direct or reverse acting function shutoff valve, but also in aseptic and tangential configurations for maximum flexibility.

The valve seals are optimized for durability and long service life through a defined compression design. The actuator is connected to the valve body using a yoke, and all components are assembled with clamp rings.

The valve can be fitted with Alfa Laval ThinkTop V-series for sensing and control of the valve. See ThinkTop datasheets for further details.

Using the Alfa Laval Anytime configurator, it is easy to customize to meet many different process requirements.

Working principle

The Alfa Laval Unique SSV Pressure Relief Valve ensures system integrity by preventing overpressure in hygienic processing lines. Easily adjust the set pressure on site using the actuator's adjustment screw to match your desired settings, which are never above the pressure rating of the system, and always higher than the operating pressure, to safeguard critical equipment like positive displacement pumps.

When the operating pressure exceeds the set threshold, the valve opens against spring force, venting pressure and protecting your equipment, system and process from potential damage.

Fit the valve with Alfa Laval ThinkTop technology to monitor and control valve positions, enabling early issue detection, preventing failures and minimizing downtime. During cleaning-in-place (CIP), the valve opens fully—regardless of the set pressure—ensuring maximum hygiene and industry standards compliance.

Technical data

Temperature/Pressure

Valve	
Product temperature range:	-10°C to +140°C / 14°F to + 284°F (EPDM)
Max. product pressure:	1000 kPa / 10 bar / 145 psi[1]
Min. product pressure:	Full vacuum (depending on product specifications)
Max. product pressure for high pressure PRV:	1600 kPa / 16 bar / 232 psi[2]
CIP temperature range[3]:	+20°C to +85°C / 38°F to 185°F
CIP pressure range[3]:	0 to 10 bar / 0 to 145 psi

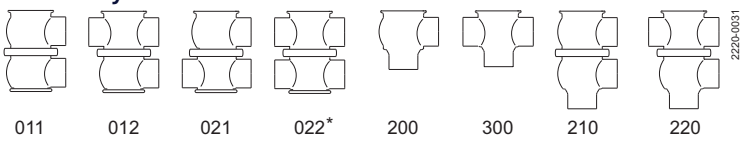
[1] PN10 version

[2] PN16 version

[3] For hazardous fluids. Ensure that conditions for hazardous fluids are such, that these are always on liquid form (never gas)

Actuator	
Temperature range:	-10 °C to +60 °C / 14 °F to + 140 °F
Air pressure:	500-700 kPa / 5-7 bar / 72.5-101.5 psi

Valve body combinations



Please note!

* Only valve body combination 022 is available for the 16-bar pressure relief valve

Actuator function

- Downward movement, spring return
- Upward movement, spring return

Physical data

Materials	
Product wetted steel parts	1.4404 (316L)
Non-product wetted steel parts	1.4301 (304)
Product wetted seals	EPDM
Alternative product wetted seals	HNBR and FPM
External surface finish	Bead blasted
Internal surface finish	Bright (polished), Ra < 0.8 µm (< 32 µin)

Options

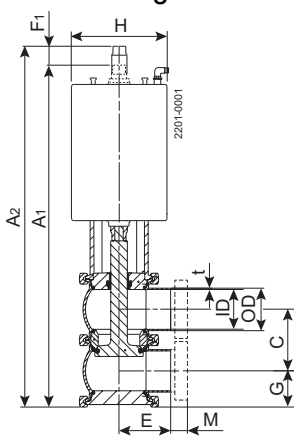
- Male parts or clamp liners in accordance with required standard
- Control and Indication: ThinkTop V-Series
- Plug seals EPDM, HNBR or FPM
- Maintainable actuator

Other valves in the same basic design

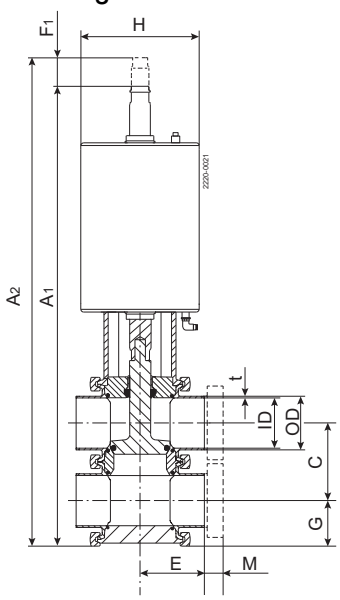
The Unique SSV valve range includes several purpose built valves. Below are some of the valve models available, though please use the Alfa Laval Anytime configurator for full access to all models and options like Aseptic or Tangential.

Dimensions

Reverse acting Shut-off valve



Direct acting Shut-off valve



mm

Nominal size	Inch tubes DN/OD						DIN tubes DN						
	25	**38**	**51**	**63.5**	**76.1**	**101.6**	**25**	**40**	**50**	**65**	**80**	**100**	**150**
A_1	369	386	411	486	538	532	377	392	416	498	555	538	616.4
A_2	381	398	423	501	553	547	389	404	428	513	570	553	633
C	47.8	60.8	73.8	86.3	98.9	123.6	52	64	76	92	107	126	192.3
OD	25	38	51	63.5	76.1	101.6	29	41	53	70	85	104	77
ID	21.8	34.8	47.8	60.3	72.9	97.6	26	38	50	66	81	100	150
t	1.2	1.6	1.6	1.6	1.6	2	1.5	1.5	1.5	2	2	2	2
E	50	49.5	61	81	86	119	50	49.5	62	78	87	120	120
F_1	12	12	12	15	15	15	12	12	12	15	15	15	16.6
G	23.9	30.4	40.5	43.15	49.45	62	26	32	38	46	53.5	63	77
H	Ø115	Ø115	Ø115	Ø157	Ø157	Ø157	Ø115	Ø115	Ø115	Ø157	Ø157	Ø157	Ø157.5
M (ISO clamp)	21	21	21	21	21	21							
M (DIN clamp)							21	21	21	28	28	28	
M (DIN male)							22	22	23	25	25	30	
M (SMS male)	20	20	20	24	24	24							

inch

Nominal size	Inch tubes DN/OD					
	1"	**1½"**	**2"**	**2½"**	**3"**	**4"**
A_1	14.53	15.2	16.18	19.13	21.18	20.94
A_2	15	15.67	16.65	19.72	21.77	21.54
C	1.88	2.39	2.91	3.4	3.89	4.87
OD	0.98	1.5	2.01	2.5	3	4
ID	0.86	1.37	1.88	2.37	2.87	3.84
t	0.05	0.06	0.06	0.06	0.06	0.08
E	1.97	1.95	2.4	3.19	3.39	4.69
F_1	0.47	0.47	0.47	0.59	0.59	0.59
G	0.94	1.2	1.59	1.7	1.95	2.44
H	Ø4.53	Ø4.53	Ø4.53	Ø6.18	Ø6.18	Ø6.18
M (ISO clamp)	0.83	0.83	0.83	0.83	0.83	0.83
M (SMS male)	0.79	0.79	0.79	0.94	0.94	0.94

Please note!
Automatic opening/closing time will be effected by the product pressure.
Opening/closing time, when forcing open with air e.g. for cleaning purposes, will be effected by the following:

- The air supply (air pressure)
- The length and dimensions of the air hoses
- Number of valves connected to the same air hose
- Use of single solenoid valve for serial connected air actuator functions

Air connections compressed air

R ⅛" (BSP). internal thread.

Air consumption (litres free air) for one stroke [bar]

Size	DN25-50 / DN/OD 25-51 mm	DN65-100 / DN/OD 63.5-101.6 mm
NO and NC	0.5 x air pressure [bar]	1.3 x air pressure [bar]

Air consumption (litres free air) for one stroke [psi]

Size	1"-2"	2½"-4"
NO and NC	0.0345 x air pressure [psi]	0.0897 x air pressure [psi]

Weight

(kg)

Nominal size	Inch tubes - DN/OD						DIN tubes - DN					
	25	38	51	63.5	76.1	101.6	25	40	50	65	80	100
Shut-off valve, config 200: [1]	4.3	5.3	5.9	11	12	13.3	4.4	5.4	6	11.1	12.1	13.4

[1] Valid for standard version PN10

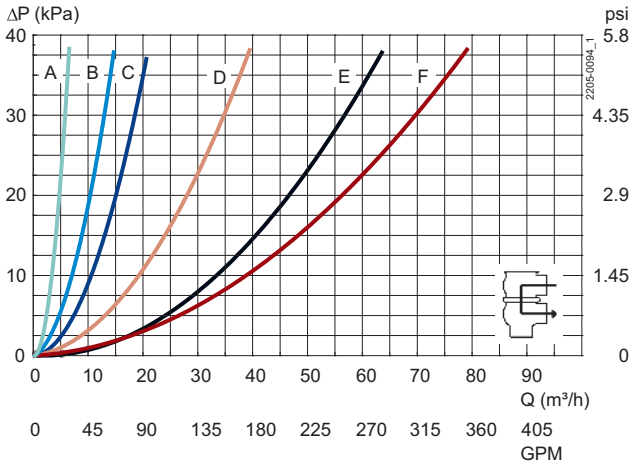
(lb)

Nominal size	1"	1½"	2"	2½"	3"	4"
Shut-off valve, config 200: [1]	9.48	11.68	13.01	24.25	26.46	29.32

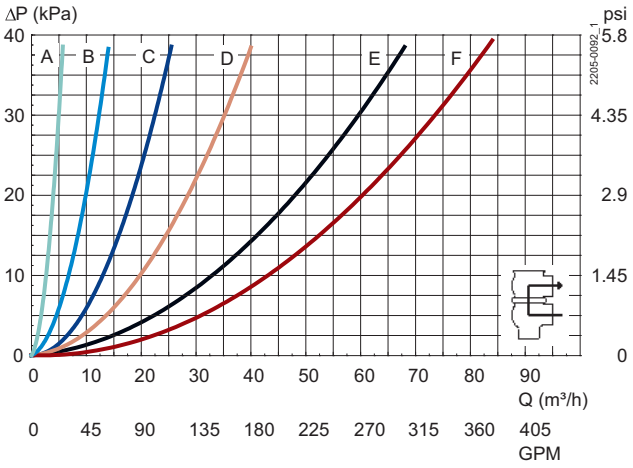
[1] Valid for standard version PN10

Pressure drop/capacity diagrams

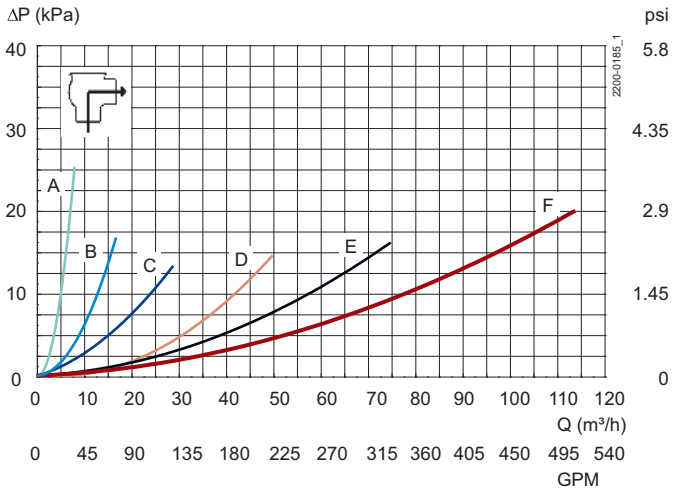
Pressure rating version PN10



A = DN25/25 Kv 10
B = DN40/38 Kv 24
C = DN50/51 Kv 34
D = DN65/63.5 Kv 63
E = DN80/76.1 Kv 103
F = DN100/101.6 Kv 128



A = DN25/25 Kv 9
B = DN40/38 Kv 23
C = DN50/51 Kv 41
D = DN65/63.5 Kv 64
E = DN80/76.1 Kv 109
F = DN100/101.6 Kv 135



A = DN25/25 Kv 15
B = DN40/38 Kv 40
C = DN50/51 Kv 80
D = DN65/63.5 Kv 131
E = DN80/76.1 Kv 186
F = DN100/101.6 Kv 257

Note! - valid for standard version PN10
For the diagrams the following applies:
Medium: Water (20°C / 68°F)
Measurement: In accordance with VDI2173
Pressure drop can also be calculated in Anytime configurator.

Pressure rating version PN16

Reverse Acting		Direct Acting	
Type	**kv value**	**Type**	**kv value**
DN25/ISO 25 mm	12	DN25/ISO 25 mm	9
DN40/ISO 38 mm	15	DN40/ISO 38 mm	11
DN50/ISO 51 mm	31	DN50/ISO 51 mm	29
DN65/ISO 63.5 mm	72	DN65/ISO 63.5 mm	48
DN80/ISO 76.1 mm	68	DN80/ISO 76.1 mm	63
DN100/ISO 101.6 mm	77	DN100/ISO 101.6 mm	67

Pressure drop calculation

Pressure drop can also be calculated with the following formula:

Metric units

Q = Kv * √Δ p

Where:

Q = Flow in min m^3/h

Kv = Flow capacity in m^3/h

Δ p = Pressure drop in bar

How to calculate the pressure drop for an ISO 2.5" shut-off valve if the flow is 40 m^3/h.

For a 2.5" shut-off valve, Kv = 131 (see table above)

40 = 131 * √Δ p

Δ p = $(40/131)^2$ = 0.093 bar

Imperial units

Q = Cv * √Δ p = 1.156 * Kv * √Δ p

Where:

Q = Flow in gallon/minute

Cv = Flow capacity in gallon/minute

Kv = Flow capacity in m^3/h

Δ p = Pressure drop in psi

How to calculate the pressure drop for an ISO 2.5" shut-off valve if the flow is 176 gallon/minute.

For a 2.5" shut-off valve, Kv = 131 (see table above)

176 = 1.156 * 131 * √Δ p

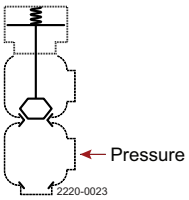
Δ p = $(176/1.156 * 131)^2$ = 1.35 psi

(This is approx. the same pressure drop by reading the y-axis above)

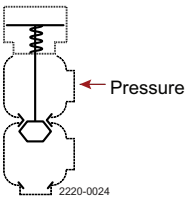
Adjustment range for relief pressure

Note! - See specific adjustment range for PN10 and PN16 below

Direct acting/shut-off:



Reverse acting:



PN10	25 mm / DN25 / 1"	38 mm / DN40 / 1½"	51 mm / DN50 / 2"	63.5 mm / DN65 / 2½"	76.1 mm / DN80 / 3"	101.6 mm / DN100 / 4"
Direct acting/shut-off	0-10 bar / 0-145 psi	0-10 bar / 0-145 psi	0-10 bar / 0-145 psi	0-10 bar / 0-145 psi	0-10 bar / 0-145 psi	0-8 bar / 0-116 psi
Reverse acting	1.5-10 bar / 21.8-145 psi	1.5-10 bar / 21.8-145 psi	1.5-10 bar / 21.8-145 psi	1.5-10 bar / 21.8-145 psi	1.5-10 bar / 21.8-145 psi	1.5-8 bar / 21.8-116 psi

PN16	25 mm / DN25 / 1"	38 mm / DN40 / 1½"	51 mm / DN50 / 2"	63.5 mm / DN65 / 2½"	76.1 mm / DN80 / 3"	101.6 mm / DN100 / 4"
Direct acting/reverse acting	8-16 bar / 116-232 psi	8-16 bar / 116-232 psi	8-16 bar / 116-232 psi	8-16 bar / 116-232 psi	8-16 bar / 116-232 psi	7-16 bar / 101-232 psi

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