Alfa Laval Safety Valve

Safety valves

Introduction

The Alfa Laval Safety Valve is a versatile hygienic spring-loaded relief valve that prevents pressure buildup in process tanks, vessels and equipment due to blocked discharge, thermal expansion, chemical reactions, or a combination of these events.

Application

This safety valve is ideal for use in the dairy, food, beverage, biotechnology, pharmaceutical and many other industries.

Benefits

- Safe, reliable operation
- Hygienic design
- Prevents unsanitary leakage and overflow
- Safeguards both personnel and equipment against accidents due to overpressure
- Optional manual or automated overwrite for valve cleaning

Standard design

The Alfa Laval Safety Valve comes in sizes from DN25 to DN100 with a spring-loaded set pressure range from 0.2 to 12 bar. The valve can be operated either pneumatically or manually. It is delivered with PED certificate and complies with PED 2014/68/EU and EN 4126-1, fluid group II (non-hazardous fluids). It is available for pressure regulation of both liquids and gases. Please note that manual pressure regulation of gases has a reduced pressure range.

Working principle

The Alfa Laval Safety Valve prevents inadmissible overpressures of fluids in tanks, containers and plant sections. It is factory-configured with the specified set pressure that is greater than the operating pressure. If the operating pressure rises above the set pressure, the valve opens against the spring force to relieve pressure.

The valve should be installed in a vertical position for optimal performance. If mounted in a horizontal position, the set pressure will be somewhat lower than specified due to the lack of weight from the piston. The highest effect is obtained using DN80 and DN100.

Technical Data

Temperature	
Temperature range:	+4 °C to +95 °C
Max. sterilisation temperature, dry steam:	140 °C (Max 30 min)

Physical Data

Materials	
Product wetted parts:	1.4404 (316L)
Other steel parts:	1.4301 (304)
Seals:	EPDM
External finish:	Ra 1.5-2.5 µm
Internal finish:	Ra 0.8 µm
Connections:	Inlet: Liner/nut DIN 11851 Outlet: Male DIN 11851

Option:

Inductive sensor for feedback is available for standard and pneumatic lifting - see instruction manual for detail.

Dimensions (mm)

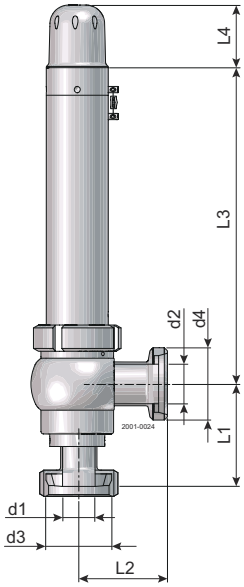


Figure 1. Standard DN25

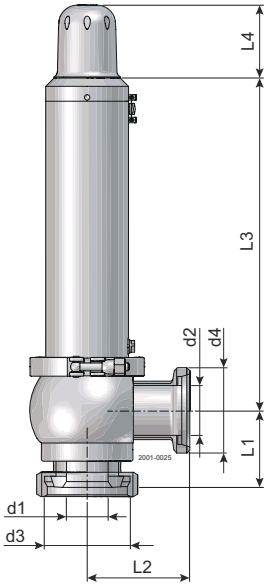


Figure 2. Standard DN40-DN100

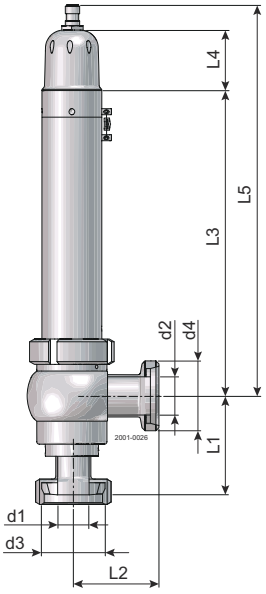


Figure 3. Standard DN25 with inductive sensor for feedback

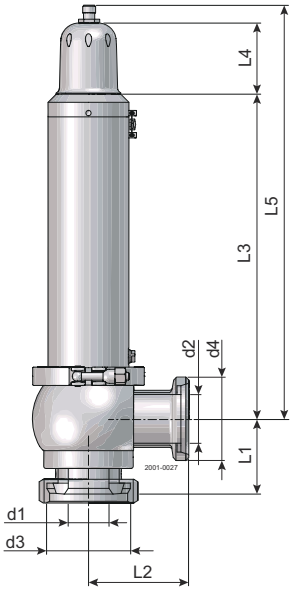


Figure 4. Standard DN40-DN100 with inductive sensor for feedback

Standard									
Size	**d1**	**d2**	**d3**	**d4**	**L1**	**L2**	**L3**	**L4**	**Kg**
DN25	26	32	Rd52x1/6	Rd58x1/6	82	72	253	50	6.8
DN40	32	38	Rd65x1/6	Rd65x1/6	68	82	255	66	9.1
DN50	38	50	Rd78x1/6	Rd78x1/6	70	93	301	66	13.0
DN65	50	66	Rd95x1/6	Rd95x1/6	85	105	402	66	15.0
DN80	66	81	Rd110x1/4	Rd110x1/4	100	115	407.5	66	22.0
DN100	81	100	Rd130x1/4	Rd130x1/4	130	130	418	66	28.2

Standard with inductive sensor for feedback										
Size	**d1**	**d2**	**d3**	**d4**	**L1**	**L2**	**L3**	**L4**	**L5**	**Kg**
DN25	26	32	Rd52x1/6	Rd58x1/6	82	72	253	50	324	6.8
DN40	32	38	Rd65x1/6	Rd65x1/6	68	82	255	66	338	9.1
DN50	38	50	Rd78x1/6	Rd78x1/6	70	93	301	66	384	13.0
DN65	50	66	Rd95x1/6	Rd95x1/6	85	105	402	66	484	15.0
DN80	66	81	Rd110x1/4	Rd110x1/4	100	115	407.5	66	489	22.0
DN100	81	100	Rd130x1/4	Rd130x1/4	130	130	418	66	501	28.2

Dimensions (mm)

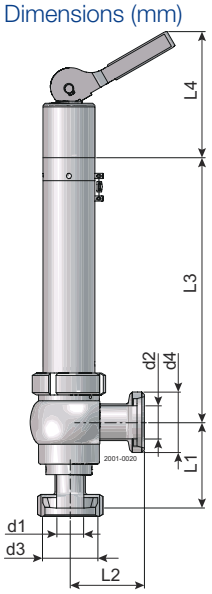


Figure 5. Manual lifting DN25

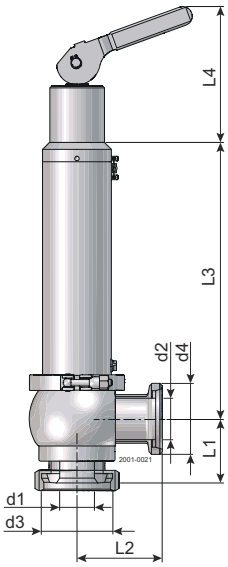


Figure 6. Manual lifting DN40-DN100

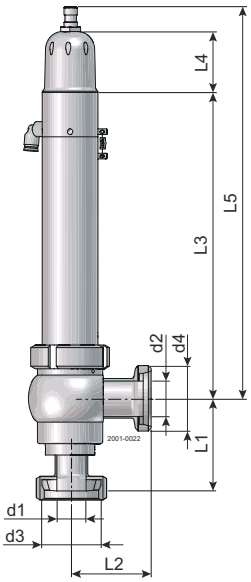


Figure 7. Pneumatic lifting DN25 with inductive sensor for feedback

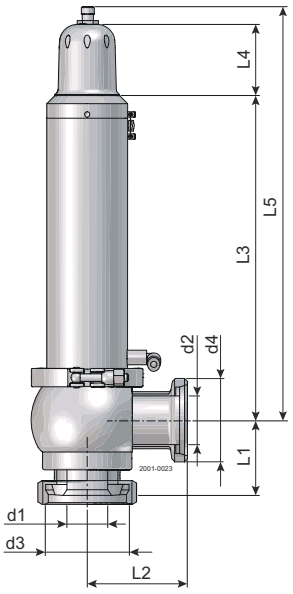


Figure 8. Pneumatic lifting DN40-DN100 with inductive sensor for feedback

Manual lifting									
Size	**d1**	**d2**	**d3**	**d4**	**L1**	**L2**	**L3**	**L4**	**Kg**
DN25	26	32	Rd52x1/6	Rd58x1/6	82	72	253	141-182	7.5
DN40	32	38	Rd65x1/6	Rd65x1/6	68	82	255	152-232	10.3
DN50	38	50	Rd78x1/6	Rd78x1/6	70	93	301	154-234	15.5
DN65	50	66	Rd95x1/6	Rd95x1/6	85	105	402	153-233	16.2
DN80	66	81	Rd110x1/4	Rd110x1/4	100	115	407.5	152.5-232.5	23.2
DN100	81	100	Rd130x1/4	Rd130x1/4	130	130	418	152-232	29.6

Pneumatic lifting with inductive sensor for feedback										
Size	**d1**	**d2**	**d3**	**d4**	**L1**	**L2**	**L3**	**L4**	**L5**	**Kg**
DN25	26	32	Rd52x1/6	Rd58x1/6	82	72	253	50	324	6.8
DN40	32	38	Rd65x1/6	Rd65x1/6	68	82	255	66	338	9.1
DN50	38	50	Rd78x1/6	Rd78x1/6	70	93	301	66	384	13.0
DN65	50	66	Rd95x1/6	Rd95x1/6	85	105	402	66	484	15.0
DN80	66	81	Rd110x1/4	Rd110x1/4	100	115	407.5	66	489	22.0
DN100	81	100	Rd130x1/4	Rd130x1/4	130	130	418	66	501	28.2

Dimensioning of valve

When ordering the safety valve you should follow this principle:

Max. admissible tank pressure > set pressure > operating pressure

You should as a minimum have a 10% buffer between the maximum admissible tank pressure and the set pressure.

The set pressure should as a guideline be 20% higher than the expected operating pressure of your process. This is to avoid opening the valve during normal operation.

Please note from the illustrations below here, that if the valve has been opened, the process pressure needs to be reduced significantly to ensure that is has fully closed again.

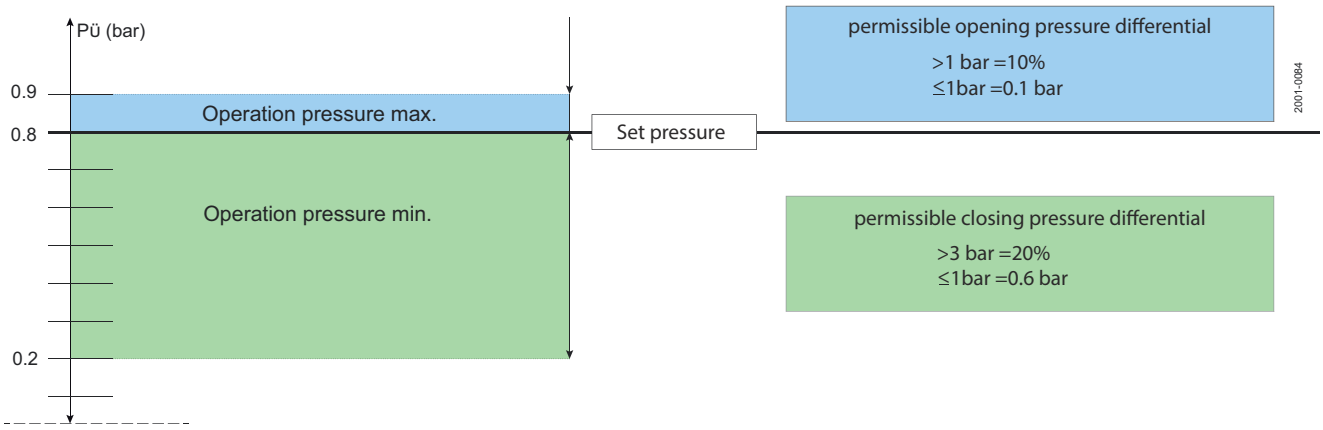
Valve characteristics when opening and closing

These two following illustrations shows the opening and closing characteristics of the valve for different media.

Note!
Note that a 10% buffer above the set pressure is required to ensure that the valve is fully open.

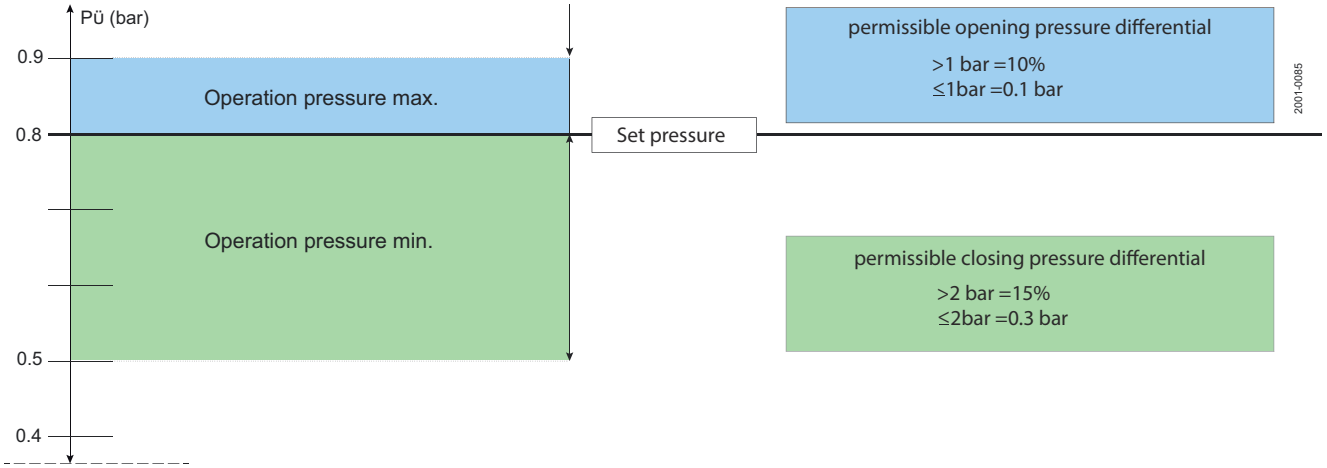
After opening of the valve, the pressure needs to be reduced significantly below the set pressure to ensure that the valve is fully closed again.

Opening and closing characteristics for incompressible fluids



(example: set pressure = 0.8 bar)

Opening and closing characteristics for compressible fluids



(example: set pressure = 0.8 bar)

Blow-off performance chart

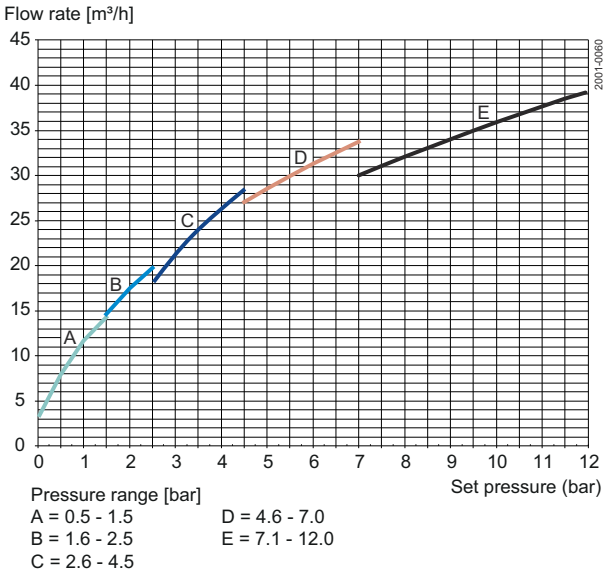


Figure 9. DN25 set pressure: 0.2 - 12.0 bar for liquids (water 20 °C)

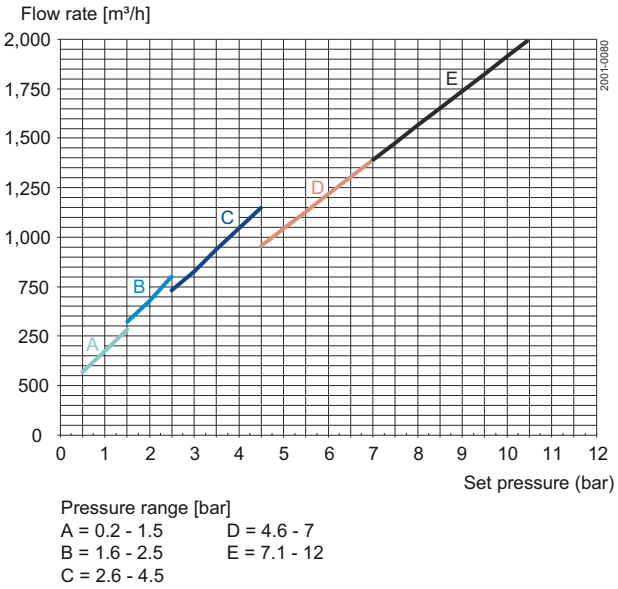


Figure 10. DN 25 set pressure: 0.2 - 12 bar for gases (air 20 °C)

Note!
DN25 for gas application up to 1,5 bar fulfills the DIN4126-1 requirements. For higher pressures the valve is approved by TÜV.

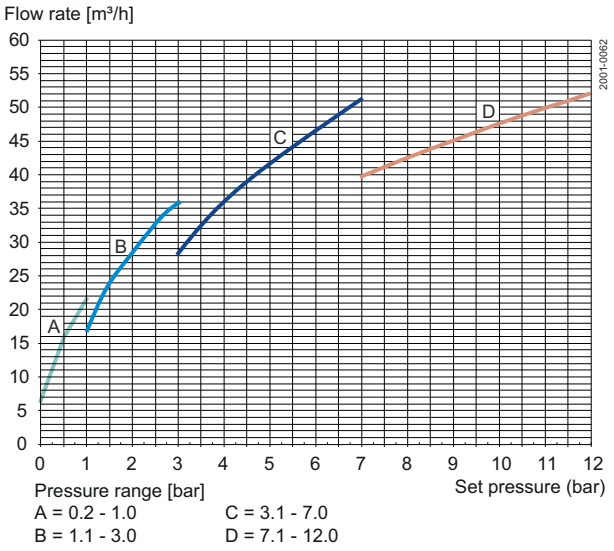


Figure 11. DN 40 set pressure: 0.2 - 12.0 bar for liquids (water 20 °C)

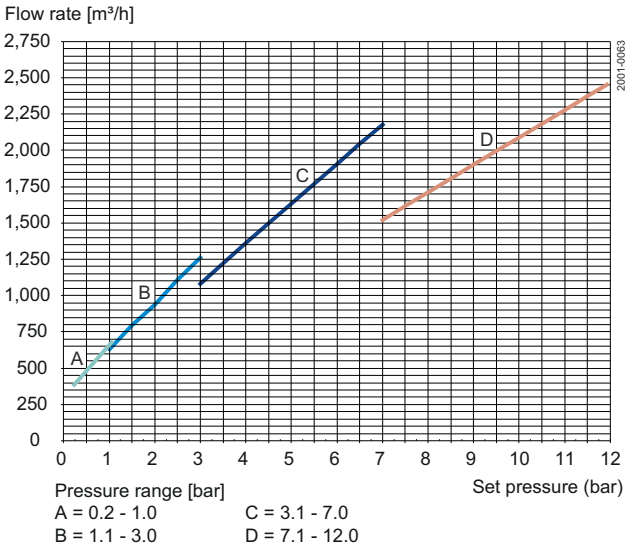


Figure 12. DN 40 set pressure: 0.2 - 12.0 bar for gases (air 20 °C)

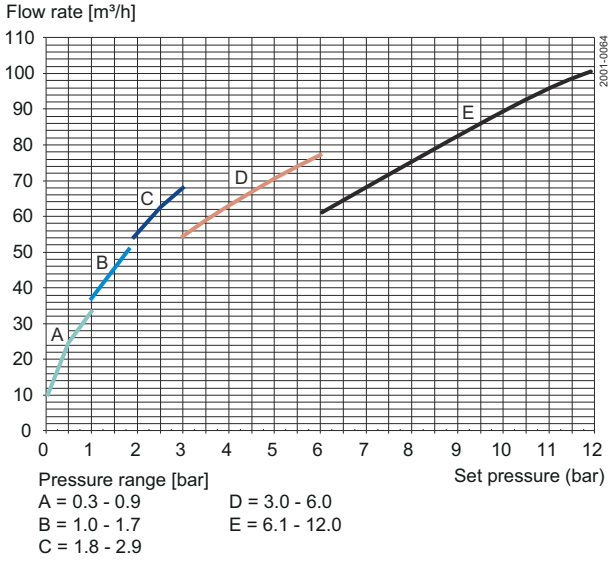


Figure 13. DN 50 set pressure: 0.3 - 12.0 bar for liquids (water 20 °C)

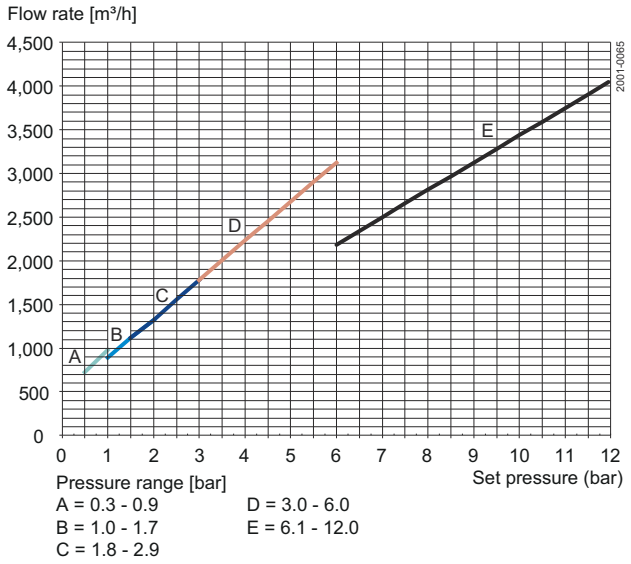


Figure 14. DN50 set pressure: 0.3 - 12.0 bar for gases (air 20 °C)

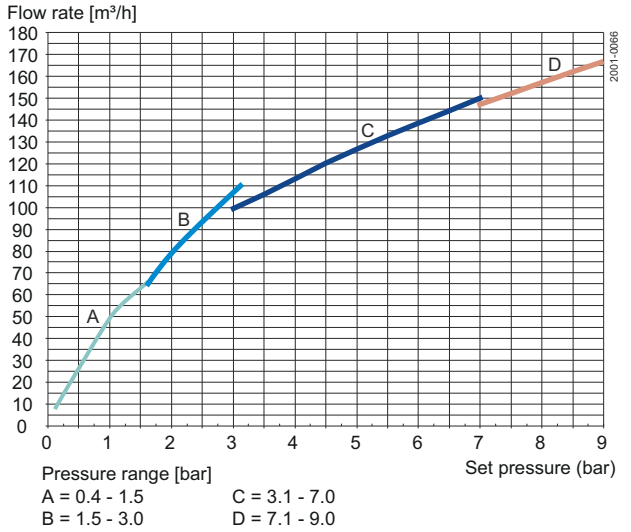


Figure 15. DN65 set pressure: 0.4 - 9.0 bar for liquids (water 20 °C)

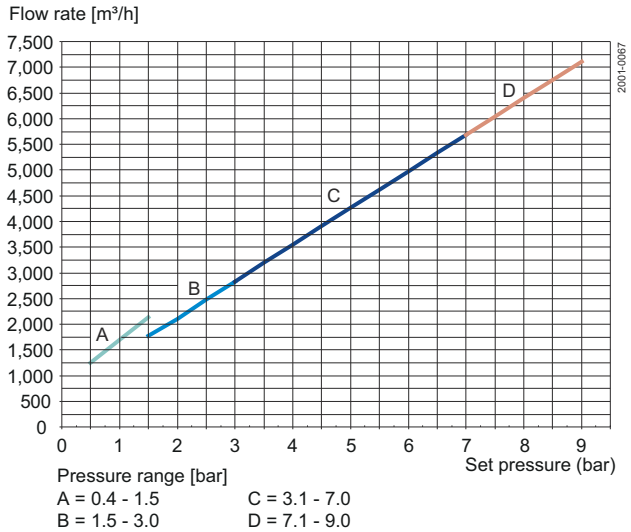


Figure 16. DN65 set pressure: 0.4 - 9.0 bar for gases (air 20 °C)

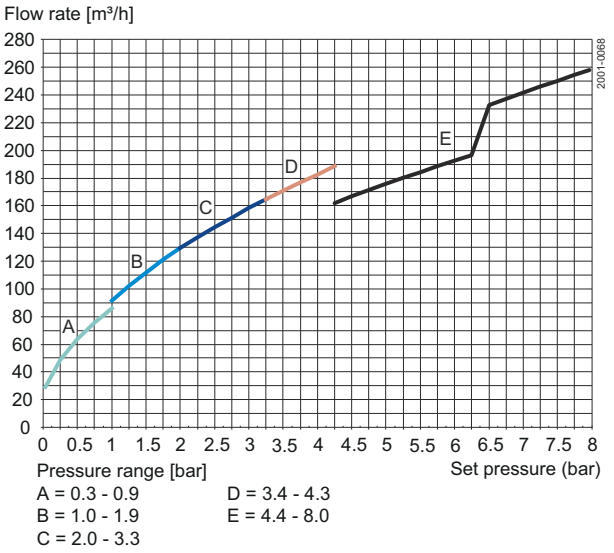


Figure 17. DN80 set pressure: 0.3 - 8.0 bar for liquids (water 20 °C)

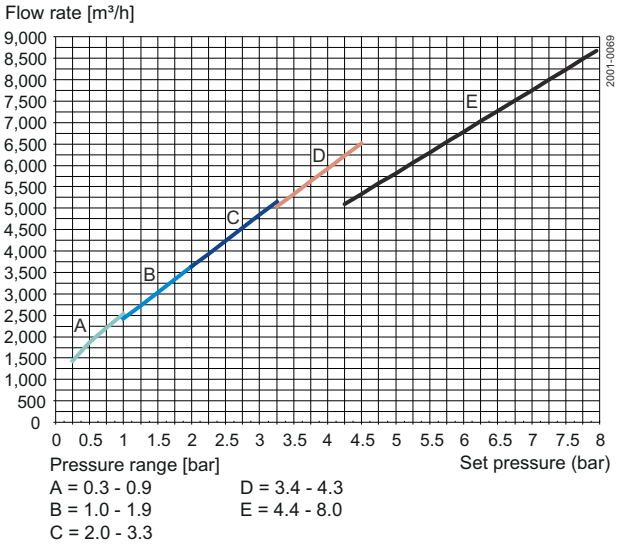


Figure 18. DN80 set pressure: 0.3 - 8.0 bar for gases (air 20 °C)

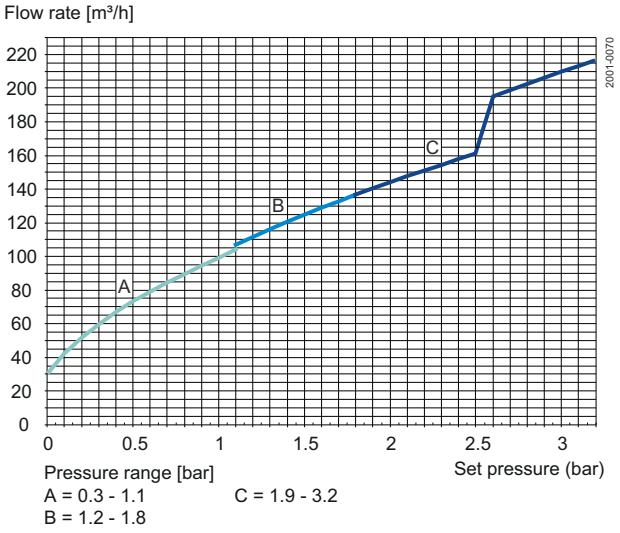


Figure 19. DN100 set pressure: 0.3 - 3.2 bar for liquids (water 20 °C)

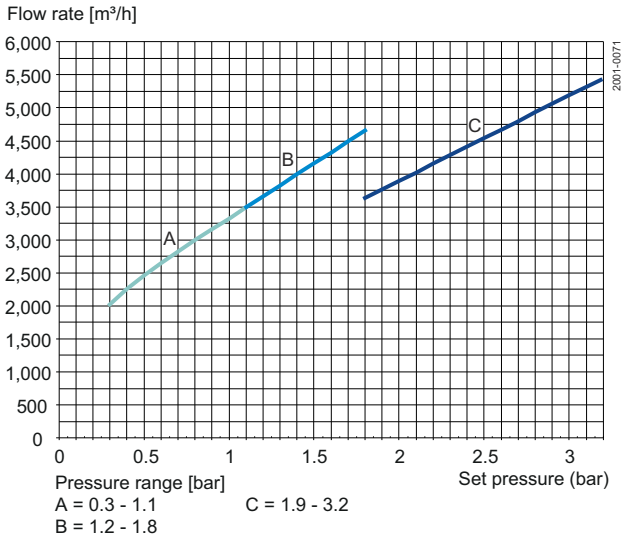


Figure 20. DN100 set pressure: 0.3 - 3.2 bar for gases (air 20 °C)

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