

Alfa Laval LKB and LKB-F

Butterfly valves

Introduction

The Alfa Laval LKB Butterfly Valve is a reliable, hygienic in-line valve for routing low and medium-viscosity liquids in stainless steel pipe systems due to its substantial opening area and low flow resistance. The LKB is available with a standard handle with spring-locking action for straightforward manual operation or with a pneumatic actuator for pneumatic operation.

Application

This hygienic valve is designed for on-off duties with low to medium-viscosity liquids in hygienic applications across the dairy, food, beverage, brewery and many other industries.

Benefits

- Versatile, highly modular, hygienic design
- Reliable, cost-effective performance
- Easy to configure in either a manual version or a pneumatic version

Standard design

The LKB Butterfly Valve consists of two valve body halves, valve disc, and bushings for the disc stem and a seal ring. These components are assembled by means of screws and nuts. The valve comes with standard weld ends but can also be supplied with fittings.

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

The valve is available in these dimension standards: the LKB for ISO and the LKB-2 for DIN tubes. The LKB is also available in a flange version, the LKB-F, with two flanges and two flange seal rings for easy removal of the valve body without dismantling further piping setups.

The actuator is available in two versions, the LKLA and the LKLA-T (T for mounting of an indication or control unit on the actuator) and in two sizes, ø85 mm and ø133 mm, to cover all valve requirements. The actuator is fitted onto the valve using a bracket and screws. A handle for manual operation is fitted onto the valve by means of a cap/block system and a screw.



Working principle

The Alfa Laval LKB Butterfly Valve can be operated either by means of a pneumatic actuator from a remote location or manually operated by means of a handle. The actuator comes in three standard versions: normally closed (NC); normally open (NO); and, air/air activated (A/A).

For pneumatic operation, an actuator converts axial piston motion into a 90° rotation of the shaft. The actuator torque increases as the valve disc comes into contact with the seal ring of the butterfly valve to secure proper closing of the valve seat.

For manual operation, a handle mechanically locks the valve in open or closed position. Two-position, four-position, regulating 90°-position, and multi-position handles are available. Manual valves can also be mounted with indication units for feedback on the valve position (open/closed).

Technical Data

Valve

Max. product pressure:	1000 kPa / 145 psi (10 bar)
Min. product pressure:	Full vacuum
Temperature range:	-10 °C to + 140 °C / 14 °F to 284 °F (EPDM) However max. 95 °C / 203 °F when operating the valve (All seals)

Actuator

Max. air pressure:		600 kPa / 87 psi (6 bar)
Min. air pressure, NC and NO:		400 kPa / 60 psi (4 bar)
Temperature range:		-25 °C to +90 °C / 15 °F to 195 °F
Air consumption (litres free air):	Ø85 mm / Ø3.35"	0.24 x p (bar)
	Ø133 mm / Ø5.24"	0.95 x p (bar)
Weight:	Ø85 mm / Ø3.35"	3 kg / 6.6 lbs
	Ø133 mm / Ø5.24"	12 kg / 26.4 lbs

ATEX

Classification:	II 2 G D ¹
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¹ This equipment is outside the scope of the directive 2014/34/EU and must not carry a separate CE marking according to the directive as the equipment has no own ignition source

Physical Data

Valve bodies

Product wetted steel parts:	1.4307 (304L) or 1.4404 (316L)
Disc:	1.4301 (304) or 1.4404 (316L)
Other steel parts:	1.4301 (304)
Rubber grades:	Q, EPDM, FPM, HNBR ¹ or PFA ^{1 2}
Bushes for valve disc:	PVDF
Finish:	Semi-bright
Inside surface finish:	≤ Ra 0.8 µm / ≤ Ra 32 µin

¹ LKB-F (DIN) with HNBR and LKB-F (DIN & ISO) with PFA are supplied with EPDM flange seal.

² PFA not FDA compliant.

Actuator

Actuator body:	1.4307 (304L)
Piston:	Light alloy Air/air version (for Ø85 mm / Ø3.35": Bronze)
Seals:	NBR
Housing for switches:	PPO

Options

- Male parts or clamp liners in accordance with required standard
- ThinkTop® for control and indication¹
- Indication unit with micro switches¹
- Indication unit with inductive proximity switches¹
- Indication unit with Hall proximity switches¹
- Explosion proof indication unit with inductive proximity switches¹
- Bracket for actuator. (Also for ball valves)
- Handle with two or four positions (standard on DN125 and DN150)
- Handle for electrical position indication
- Handle for electrical position indication
- Handle with infinite intermediate positions (not for DN125 and DN150)
- Multipositioning handle²
- Lockable Multiposition Handle. Padlock can be mounted as shown in fig. 3. **Note!** Padlock is not delivered
- Special cap for 90° turned handle position
- Service tool for actuator
- Service tool for fitting 25-38 mm (DN25 - DN40) valve discs

¹ For further information see Product Catalogue chapter "Control & Indication"

² **Note!** A padlock can be mounted on the Lockable Multiposition. Handle as shown in the opposite figure. Padlock is not delivered

**Note!**

For further details, see instruction manual.

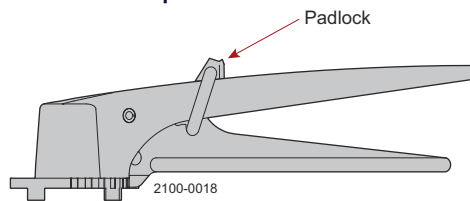
LKB Handle Options

Figure 1. Lockable Multiposition Handle with padlock

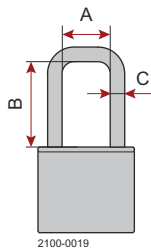


Figure 2. Dimensions - padlock

A. Min. 20 mm

B. Min. 35 mm

C. $\varnothing 6$ mm

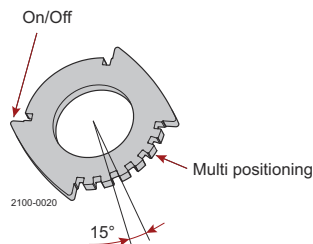


Figure 3. Positioning cap

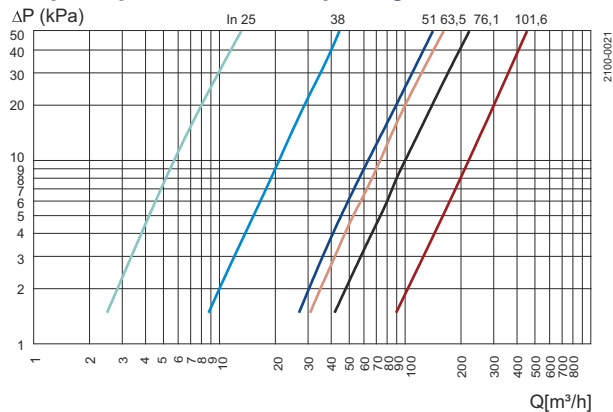
Capacity/Pressure drop diagrams

Figure 4. LKB and LKB-F fully open

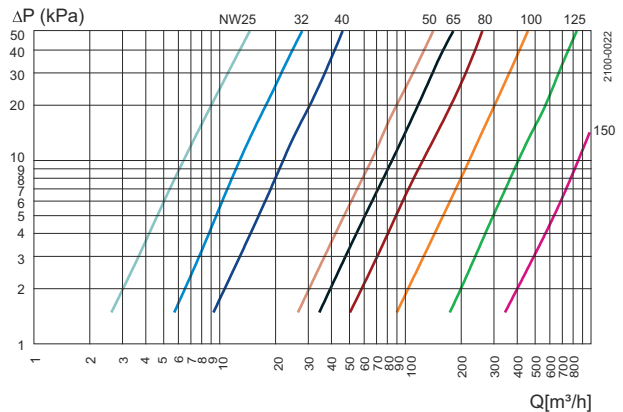


Figure 5. LKB-2 and LKB-F fully open



Note! For the diagrams the following applies:

Medium: Water (20°C).

Measurement: In accordance with VDI 2173.

Torque diagrams - Actuator

LKLA $\varnothing 85$ mm:

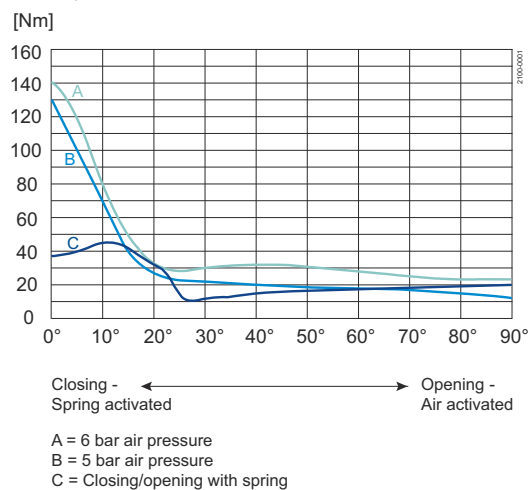


Figure 6. NC

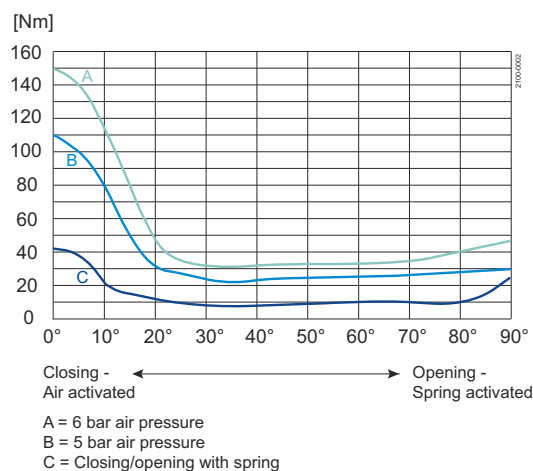


Figure 8. NO

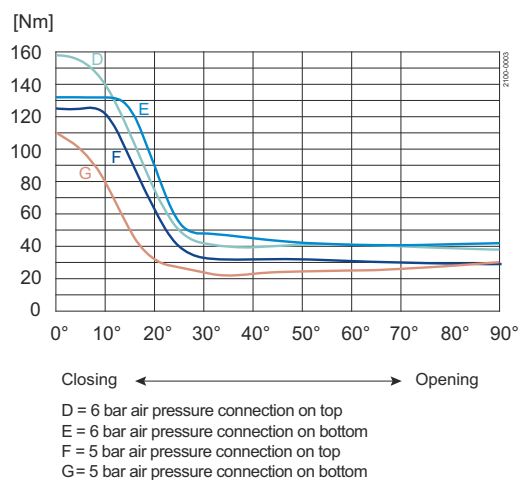


Figure 10. A/A

LKLA $\varnothing 133$ mm:

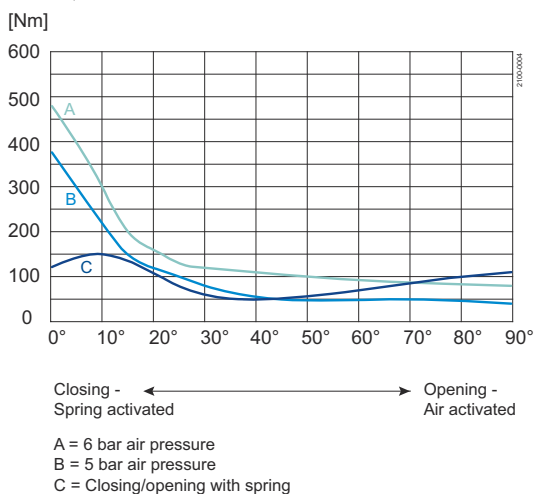


Figure 7. NC

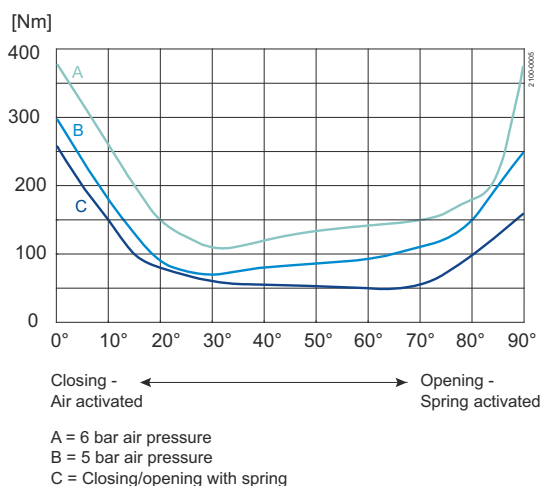


Figure 9. NO

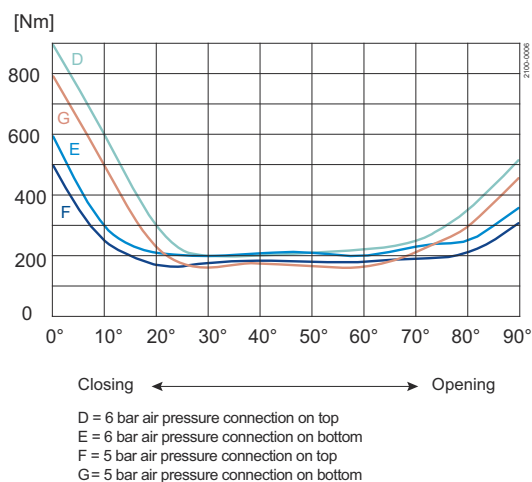


Figure 11. A/A

Alfa Laval recommends actuator size $\varnothing 133$ for $>101.6/\text{DN}100$

Torque values (for rotating the valve disc in a dry seal ring)

Size	Max. Nm
25mm/DN25	15
DN32	15
38mm/DN40	15
51mm/DN50	20
63.5mm/DN65	25
76mm/DN80	30
101.6mm/DN100	35
DN125	50
DN150	120

Dimensions (mm)

Dimensions - valve

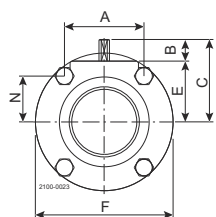


Figure 12. LKB, LKB-F

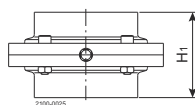


Figure 13. LKB with welding ends.

Note! LKB sizes DN 125 and 150 are with six screws.

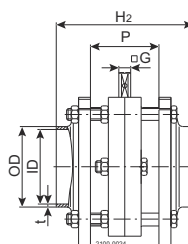


Figure 14. c. LKB-F with welding ends

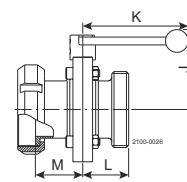


Figure 15. LKB with male part/nut and liner

Dimensions (mm) - Valve LKB, LKB-2, LKB-F:

Size	25 mm	38 mm	51 mm	63.5 mm	76.1 mm	101.6 mm	152 mm	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150
A	42.0	42.0	61.0	61.0	79.5	106.0	98.0	42.0	42.0	42.0	61.0	61.0	79.0	106.0	106.0	98.0
B	15.5	16.7	16.6	17.5	16.6	16.0	18.0	14.7	15.9	16.7	16.6	17.5	16.0	16.0	18.0	18.0
C	48.0	49.0	58.5	69.5	73.5	93.0	122.0	48.0	49.0	54.0	63.0	75.0	79.0	93.0	115.0	122.0
OD	25.6	38.6	51.6	64.1	76.6	102.2	152.7	30.0	36.0	42.0	54.0	70.0	85.0	104.0	129.0	154.0
ID	22.5	35.5	48.5	60.5	72.0	97.6	146.9	26.0	32.0	38.0	50.0	66.0	81.0	100.0	125.0	150.0
t	1.55	1.55	1.55	1.8	2.3	2.3	2.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
E	32.5	32.5	42.0	52.0	57.0	77.0	104.0	33.3	33.3	37.7	46.6	57.3	63.0	77.0	96.7	104.0
F	78.0	78.0	99.0	117.0	132.0	169.0	216.0	79.0	79.0	86.5	105.7	125.0	143.0	169.0	199.0	216.0
G	8.0	8.0	8.0	8.0	10.0	12.0	15.0	8.0	8.0	8.0	8.0	10.0	10.0	12.0	14.0	15.0
H ₁	47.0	47.0	52.0	54.0	62.0	80.0	80.0	47.0	47.0	47.0	52.0	62.0	64.0	80.0	110.0	80.0
H ₂	83.0	83.0	92.0	92.0	114.0	132.0	-	83.0	83.0	83.0	92.0	114.0	116.0	132.0	136.0	152.0
J	73.5	73.5	83.0	93.0	98.0	120.0	161.0	74.0	74.0	79.0	88.0	98.0	104.0	120.0	150.0	161.0
K	120.0	120.0	120.0	120.0	170.3	162.0	360.0	120.0	120.0	120.0	120.0	170.3	170.3	162.0	223.0	360.0
L IDF/ISO	45.0	45.0	47.5	48.5	52.5	61.5	-	-	-	-	-	-	-	-	-	-
M IDF/ISO	55.5	55.5	58.0	59.0	63.0	81.5	-	-	-	-	-	-	-	-	-	-
L DS	42.0	43.5	46.0	51.0	55.0	64.0	-	-	-	-	-	-	-	-	-	-
M DS	54.5	54.5	57.0	59.0	63.0	72.0	-	-	-	-	-	-	-	-	-	-
L SMS	38.5	43.5	46.0	51.0	55.0	75.0	-	-	-	-	-	-	-	-	-	-
M SMS	51.0	52.5	55.0	56.0	61.0	72.0	-	-	-	-	-	-	-	-	-	-
L BS	45.7	45.7	48.2	49.2	53.2	67.0	-	-	-	-	-	-	-	-	-	-
M BS	50.5	50.5	53.0	54.0	58.0	71.8	-	-	-	-	-	-	-	-	-	-
L DIN	45.5	45.5	48.0	52.0	61.0	70.0	-	40.0	40.0	37.0	37.0	43.0	48.0	51.0	55.0	115.0
M DIN	61.5	61.5	66.0	67.0	71.0	83.0	-	45.5	48.5	49.5	54.0	63.0	69.0	84.0	89.0	77.0
L Clamp	45.0	45.0	47.5	48.5	52.5	61.5	78.1	45.0	45.0	45.0	47.5	59.0	60.0	68.0	83.0	68.0
N	26.5	26.5	30.5	40.5	43.5	53.0	85.0	27.3	27.3	31.7	35.1	45.8	49.5	53.0	72.7	85.0
P	42.0	42.0	46.0	46.0	58.0	58.0	-	42.0	42.0	42.0	46.0	58.0	58.0	58.0	62.0	78.0
Weight LKB-F (kg)	1.6	1.3	2.1	2.9	5.0	7.9	-	1.6	1.6	1.7	2.6	4.7	5.8	7.9	11.7	12.3
Weight LKB/ LKB-2 (kg)	1.2	1.0	1.5	2.1	3.0	4.7	9.9	1.2	1.1	1.3	1.8	3.0	3.5	5.1	7.5	9.0



Note! Weights are for valves with welding ends and handles.

Dimensions - actuator

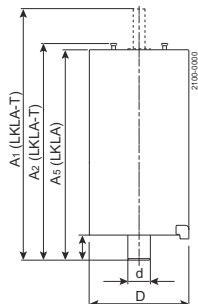


Figure 16. Without coupling

a1 = d

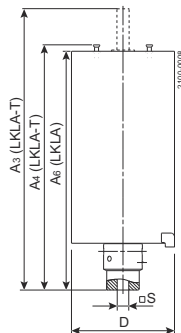


Figure 17. With coupling

b1 = □S

LKLA and LKLA-T:

Valve size	25-63.5 mm	76.1 mm	101.6 mm	101.6 mm				
	DN25-50	DN65-80	DN100	DN100	DN125	DN125	DN150	DN150
A ₁	217.1	217.1	217.1	337	217.1	337	217.1	337
A ₂	173.5	173.5	173.5	290	173.5	290	173.5	290
A ₃	236.1	234.1	234.1	363.5	237.1	363.5	237.1	363.5
A ₄	192.5	190.5	190.5	316.5	193.5	316.5	193.5	316.5
A ₅	165.5	165.5	165.5	282	165.5	282	165.5	282
A ₆	184.5	182.5	182.5	308.5	185.5	308.5	185.5	308.5
D	85	85	85	133	85	133	85	133
d	17	17	17	30	20	30	20	30
l	16.5	16.5	16.5	34	16.5	34	16.5	34
S	8	10	12	12	14	14	15	15
Function	NC,NO,A/A	NC,NO,A/A	NC,NO,A/A	NC,NO,A/A	A/A	NC,NO,A/A	A/A	NC,NO,A/A

Connections

Compressed air

R1/8" (BSP), internal thread.

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