



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 also be fitted with the Alfa Laval ThinkTop® V50 and V70 for sensing and control of the valve.

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, $\varnothing 85$ mm and $\varnothing 133$ 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 (10 bar) |
| Min. product pressure: | Full vacuum |
| Temperature range: | -10°C to + 140°C (EPDM) However max. 95°C when operating the valve (All seals) |
| Actuator | |
| Max. air pressure: | 600 kPa (6 bar) |
| Min. air pressure, NC and NO: | 400 kPa (4 bar) |
| Temperature range: | -25°C to +90°C |
| Air consumption (litres free air) - \varnothing 85 mm: | 0.24 x p (bar) |
| Air consumption (litres free air) - \varnothing 133 mm: | 0.95 x p (bar) |
| Weight: | - \varnothing 85 mm: 3 kg - \varnothing 133 mm: 12 kg |

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⁾ |
| Bushes for valve disc: | PVDF |
| Finish: | Semi-bright |
| Inside surface finish: | \leq Ra 0.8 μ m |

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

| Actuator | |
|----------------|--|
| Actuator body: | 1.4307 (304L) |
| Piston: | Light alloy (for \varnothing 85 mm: Bronze) Air/air version |
| Seals: | NBR |

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

Options

- A. Male parts or clamp liners in accordance with required standard.
- B. ThinkTop® for control and indication.*
- C. Indication unit with micro switches.*
- D. Indication unit with inductive proximity switches.*
- E. Indication unit with Hall proximity switches.*
- F. Explosion proof indication unit with inductive proximity switches.*
- G. Bracket for actuator. (Also for ball valves).
- H. Handle with two or four positions (standard on DN125 and DN150).
- I. Handle for electrical position indication.
- J. Handle with infinite intermediate positions (not for DN125 and DN150).
- K. Multipositioning handle**.
- L. Lockable Multiposition Handle. Padlock can be mounted as shown in fig. 3.

Note! Padlock is not delivered.

- M. Special cap for 90° turned handle position.
- N. Service tool for actuator.

O. Service tool for fitting 25-38 mm (DN25 - DN40) valve discs.

* For further information see Product Catalogue chapter "Control & Indication".

** A padlock can be mounted on the Lockable Multiposition Handle as shown in the opposite figure.

Note! Padlock is not delivered.

Note! For further details, see also ESE02446.

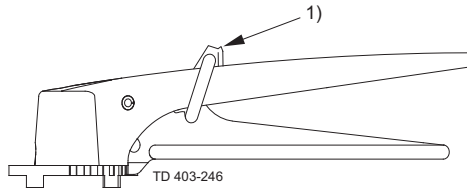


Fig. 1. Lockable Multiposition Handle with padlock.

1. Padlock

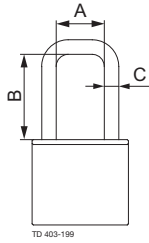


Fig. 2. Dimensions - padlock.

A. Min. 20 mm

B. Min. 35 mm

C. $\varnothing 6$ mm

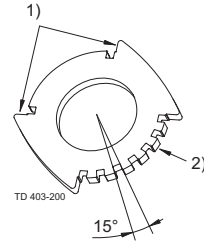
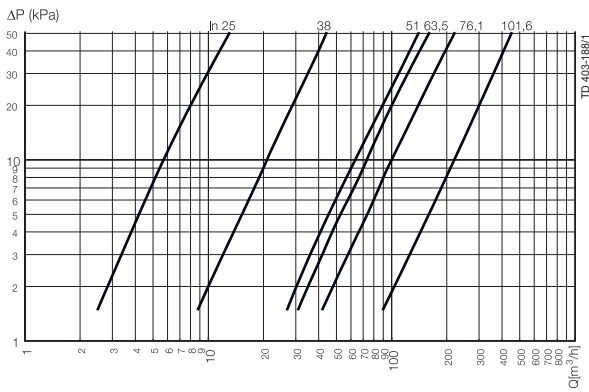


Fig. 3. Positioning cap.

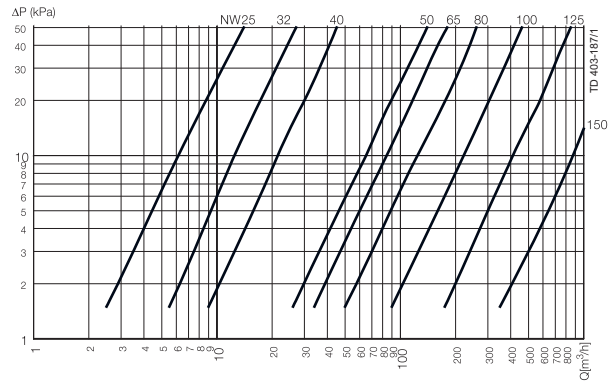
1. On/Off

2. Multi positioning

Capacity/Pressure drop diagrams



LKB and LKB-F fully open



LKB-2 and LKB-F fully open

NOTE!

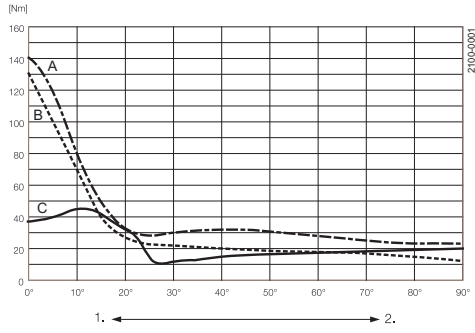
For the diagrams the following applies:

Medium: Water (20°C)(68°F).

Measurement: In accordance with VDI 2173.

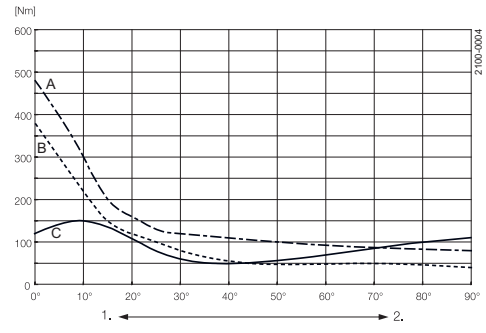
Torque diagrams - Actuator

LKLA ø85 mm:
NC



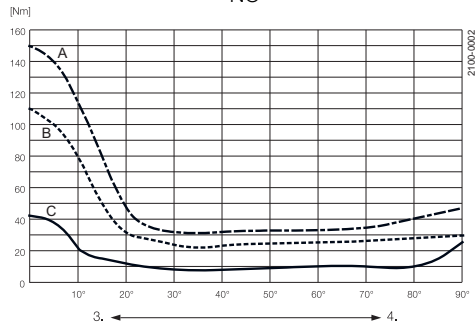
1. Closing - Spring activated 2. Opening - Air activated

LKLA ø133 mm:
NC



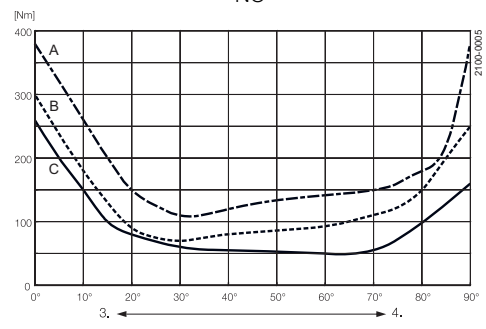
1. Closing - Spring activated 2. Opening - Air activated

NO



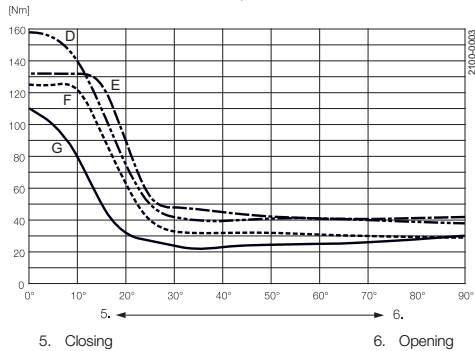
3. Closing - Air activated 4. Opening - Spring activated

NO



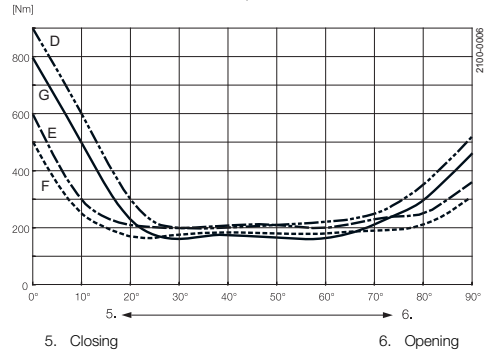
3. Closing - Air activated 4. Opening - Spring activated

A/A



5. Closing 6. Opening

A/A



5. Closing 6. Opening

- A = 6 bar air pressure
- B = 5 bar air pressure
- C = Closing/opening with spring

- D = 6 bar air pressure connection on top
- E = 6 bar air pressure connection on bottom
- F = 5 bar air pressure connection on top
- G = 5 bar air pressure connection on bottom

Alfa Laval recommends actuator size ø133 for $\geq 101.6/\text{DN}100$

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 |

Valve Dimensions (mm)

Fig. 1. Dimensions - valve.

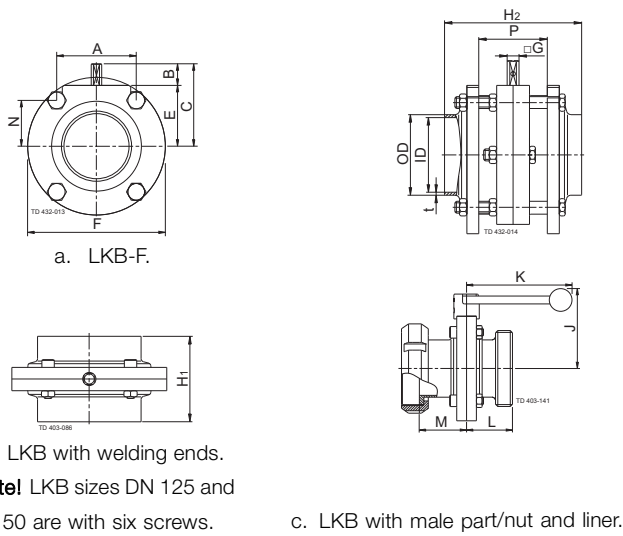
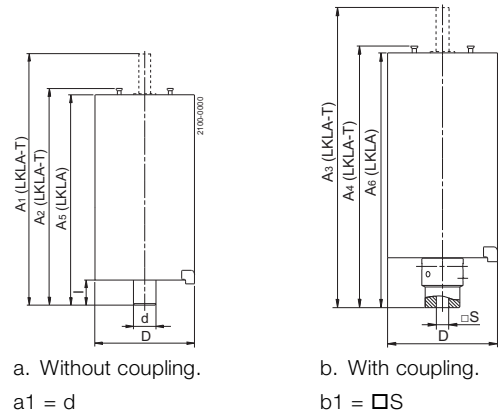


Fig. 2. Dimensions - actuator



Note! LKB sizes DN 125 and

150 are with six screws.

c. LKB with male part/nut and liner.

Dimensions (mm) - Valve

LKB, LKB-2, LKB-F:

| Size | 25 | 38 | 51 | 63.5 | 76.1 | 101.6 | DN | DN | DN | DN | DN | DN | DN | DN | DN |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | mm | mm | mm | mm | mm | mm | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
| A | 42.0 | 42.0 | 61.0 | 61.0 | 79.5 | 106.0 | 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 | 14.7 | 15.9 | 16.7 | 16.6 | 17.5 | 16.0 | 16.0 | 18.0 | 18.0 |
| C | 49.0 | 49.0 | 58.5 | 69.5 | 73.5 | 93.0 | 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 | 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 | 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 | 2.0 | 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 | 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 | 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 | 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 | 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 | 82.0 | 82.0 | 92.0 | 102.0 | 107.0 | 127.0 | 74.0 | 74.0 | 78.0 | 88.0 | 98.0 | 104.0 | 118.0 | 150.0 | 161.0 |
| K | 120.0 | 120.0 | 120.0 | 120.0 | 162.0 | 162.0 | 120.0 | 120.0 | 120.0 | 120.0 | 162.0 | 162.0 | 162.0 | 223.0 | 338.0 |
| 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 | 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 | 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 | 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 (mm) - Actuator

LKLA and LKLA-T:

| Valve size | 25-63.5 DN25-50 | 76.1 DN65-80 | 101.6 DN100 | 101.6 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.

Alfa Laval reserves the right to change specifications without prior notification.

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