

Alfa Laval LKB UltraPure

Butterfly valves

Introduction

The Alfa Laval Leakage Detection Butterfly Valve is a hygienic in-line valve for routing low and medium-viscosity liquids in stainless steel pipe systems. The Leakage Detection Butterfly Valve is available with a standard handle with spring-locking action for straightforward manual operation or with a pneumatic actuator for pneumatic operation.

Application

This in-line butterfly valve is designed for on-off duties in high-purity applications across the personal care, biotechnology and pharmaceutical industries.

Benefits

- Versatile, highly modular design
- Competitively priced alternative to diaphragm valves in certain applications
- Full transparency and traceability of the entire supply chain due to the Alfa Laval Q-doc documentation package
- Easy to configure in either a manual version or a pneumatic version

Standard design

The LKB UltraPure Butterfly Valve consists of two valve body halves, valve disc, and bushings for the disc stem and seal ring, assembled by means of screws and nuts.

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

Working principle

The Alfa Laval LKB UltraPure Butterfly Valve is either controlled remotely by means of an pneumatic actuator or manually by means of a handle.

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. The actuator comes in



three standard versions: normally closed (NC); normally open (NO); and, air/air activated (A/A). Two actuator sizes, \varnothing 3.35" and \varnothing 5.24", cover all valve sizes and are available in two versions, LKLA and LKLA-T (T for mounting of indication or control unit on the actuator).

For manual operation, the handle mechanically locks the valve in open or closed position. Handles are available in two positions, four positions, regulating 90° position, and multi-position. The valve can be supplied either with welding connections or clamp connections and can be mounted with indication units for feedback on the valve position (open or closed).

Technical Data

Valve

Max. product pressure:	145 PSI (10 bar)
Min. product pressure:	Full vacuum
Temperature range:	14 °F to +284 °F (EPDM) However max. 203 °F when operating the valve (All seals)

Actuator

Max. air pressure:	87 PSI (6 bar)
Min. air pressure, NC and NO:	58 PSI (4 bar)
Temperature range:	-13 °F to +194 °F
Air consumption (litres free air):	
- ø85 mm:	0.24 x p (bar)
- ø133 mm:	0.95 x p (bar)
Weight:	
- ø85 mm:	6.6 lb
- ø133 mm:	26.5 lb

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



Weight

Size	1"	1½"	2"	2½"	3"	4"
lb	2.65	2.20	3.31	4.63	6.61	10.36

Physical Data

Materials

Product wetted steel part:	1.4404 (AISI 316L) acc. to EN 10088
Other steel parts:	1.4301 (AISI 304) acc. to EN 10088
Bushings for valve disc:	PVDF

Elastomers

Product wetted seals:	EPDM acc. to FDA and USP Class VI
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Connections

Weld ends: ¹	Matching tubes and fittings: ASME BPE Acc. to or ASME BPE
Clamp ends:	Matching tubes and fittings: ASME BPE Acc. to or ASME BPE

¹ Weld ends on ASME BPE valves are according to ASME BPE 2009 316L Table DT-3 with low sulfur and suitable for orbital welding

Actuator

Actuator body:	1.4307 (304L)
Piston:	Light alloy Air/air version (for ø85 mm: Bronze)
Seals:	NBR
Housing for switches:	PPO

Surface specification (Product wetted steel parts)

ASME BPE:¹

Internal:	20 µin
ASME BPE designation:	SF1
External:	Semi-bright

ASME BPE:¹

Internal:	15 µin electro polish
ASME BPE designation:	SF4
External:	Semi-bright

¹According to ASME BPE 2009 table SF-3

Options

- Product wetted seals: FPM (Acc. to USP Class VI), HNBR, Q and PFA.
- Tri-Clamp® or butt weld ends standard
- ThinkTop® for control and indication.¹
- Green Top - position indication MS or PS
- Indication unit with micro switches.¹
- Indication unit with inductive proximity switches.¹
- Handle with two or four positions.
- Handle for electrical position indication.
- Handle with infinite intermediate positions.
- Multi-positioning handle with lever handle or pull knob
- Service tool for actuator.
- Service tool for fitting 1"-1.5" valve discs

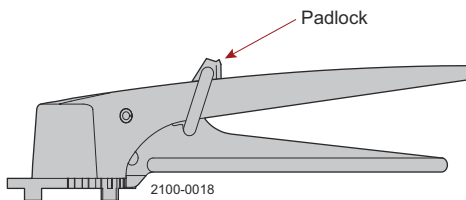


Figure 1. Lockable Multiposition Handle with padlock

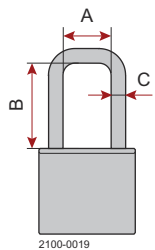


Figure 2. Fig. 2. Dimensions - padlock

- A. Min. 0.79 inch
- B. Min. 1.38 inch
- C. ø 0.23 inch

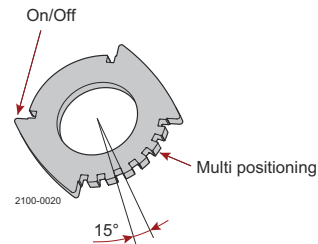


Figure 3. Positioning cap



Note! For Ultra Pure ASME BPE clamp valve (size 1" - 2½")

Installation and removal of some clamp rings is easiest by removal of the lockable multi position handle first.

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

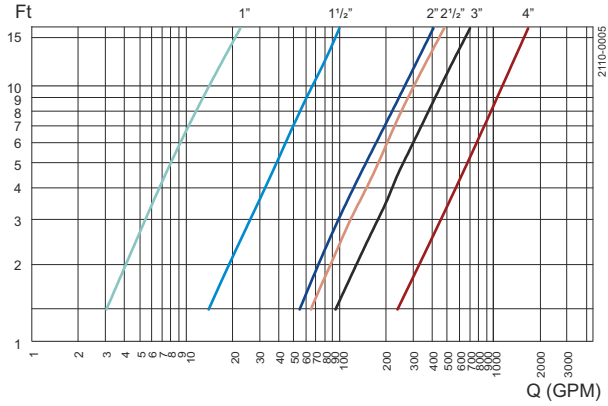
Documentation

All valves are delivered with Alfa Laval Q-doc.



Note! For further details, see instruction manual.

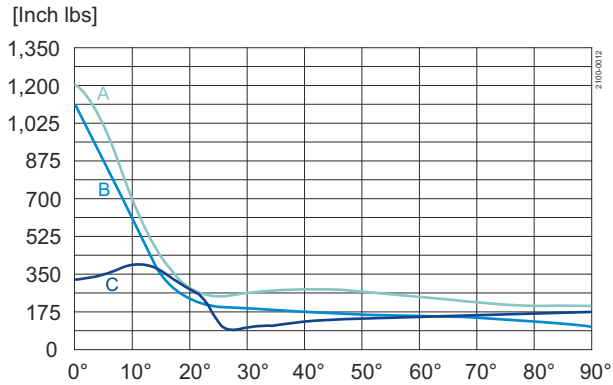
Capacity/Pressure drop diagrams



Note! For the diagrams the following applies:
 Medium: Water (68 °F).
 Measurement: In accordance with VDI 2173.

Torque diagrams - Actuator

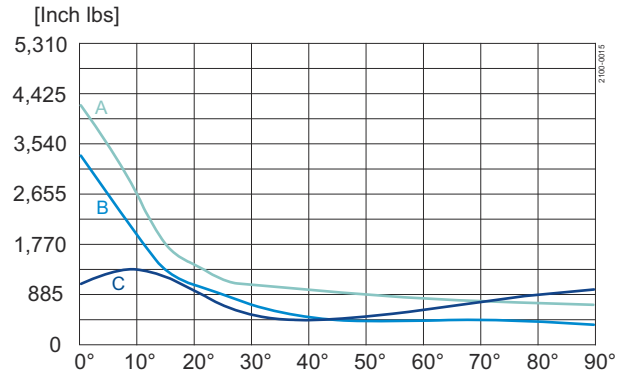
LKLA ø3.35 in:



Closing - ← Spring activated → Opening - Air activated

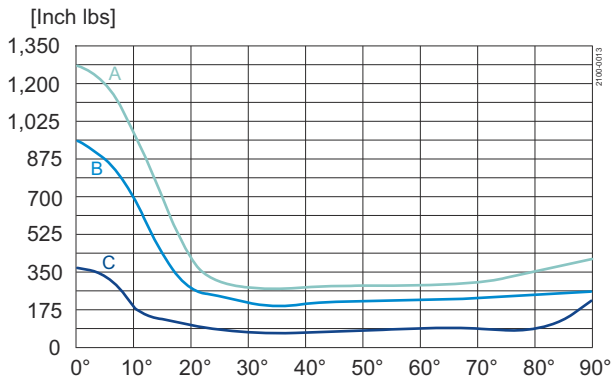
A = 6 bar air pressure
B = 5 bar air pressure
C = Closing/opening with spring

LKLA ø5.25 :



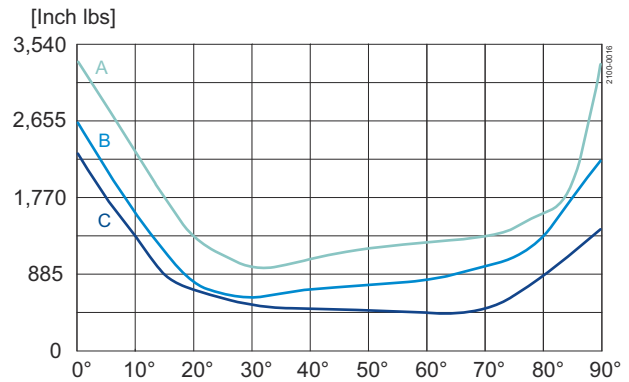
Closing - ← Air activated → Opening - Air activated

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



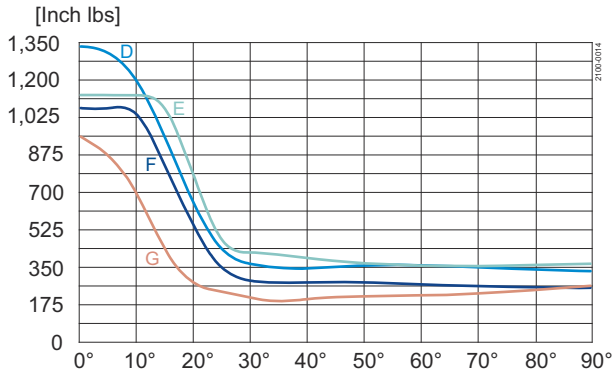
Closing - ← Air activated → Opening - Spring activated

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



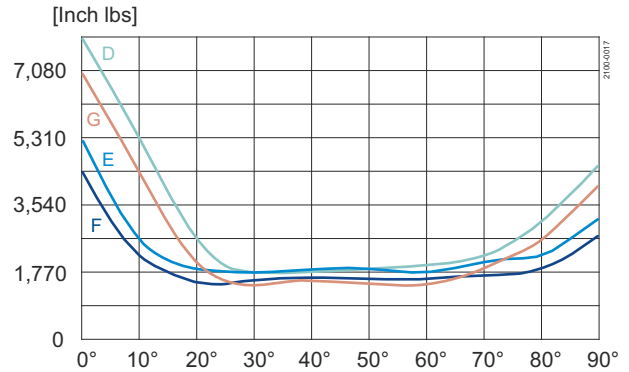
Closing - ← Air activated → Opening - Spring activated

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



Closing ← → Opening

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



Closing ← → Opening

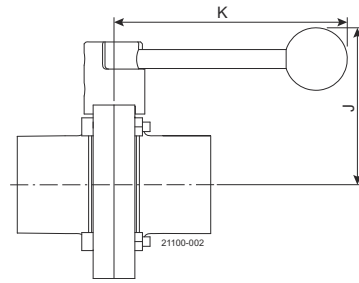
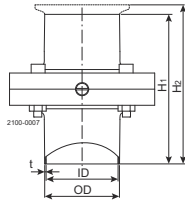
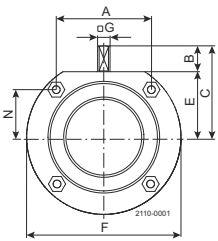
D = 6 bar air pressure connection on top
E = 6 bar air pressure connection on bottom
F = 5 bar air pressure connection on top
G = 5 bar air pressure connection on bottom

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

Valve Size	Max Torque (Inch-lbs)
1-inch	133
1.5-inch	133
2-inch	177
2.5-inch	221
3-inch	266
4-inch	310
6-inch	1062

Dimensions (inch)

Dimensions - valve



Dimensions (inch)

LKB UltraPure

Size	1"	1½"	2"	2½"	3"	4"
A	1.654	1.654	2.402	2.402	3.130	4.173
B	0.610	0.657	0.654	0.689	0.654	0.630
C	1.89	1.929	2.303	2.736	2.894	3.661
OD	1.0	1.5	2.0	2.5	3.0	4.0
ID	0.870	1.370	1.870	2.370	2.870	3.834
t	0.065	0.065	0.065	0.065	0.065	0.083
E	1.280	1.280	1.654	2.047	2.244	3.031
F	3.071	3.071	3.898	4.606	5.197	6.654
□G	0.315	0.315	0.315	0.315	0.394	0.472
H ₁	5.000	5.000	5.197	5.276	6.378	7.087
H ₂	4.10	4.10	4.30	4.38	6.94	7.65
J	2.89	2.89	3.27	3.66	3.86	4.72
K	4.724	4.724	4.724	4.724	6.378	6.378
N	1.043	1.043	1.201	1.594	1.713	2.087



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

Dimensions - actuator

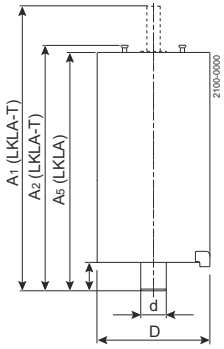


Figure 4. a. Without coupling

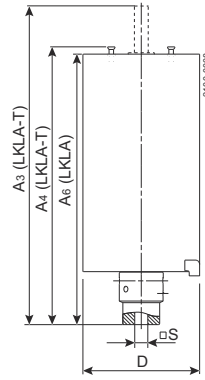


Figure 5. b. With coupling

Dimensions (inch) - Actuator LKLA and LKLA-T

Valve size	1"-2.5"	3"	4"	4"
A ₁	9.61	9.53	9.53	14.29
A ₂	6.83	6.83	6.83	11.42
A ₃	9.61	9.61	9.61	13.27
A ₄	7.58	7.5	7.5	12.46
D	3.35	3.35	3.35	5.24
d	0.67	0.67	0.67	1.18
I	0.65	0.65	0.65	1.34
□S	0.31	0.39	0.47	0.47
Function	NC,NO,A/A	NC,NO,A/A	NC,NO,A/A	NC,NO,A/A



Note! Suitability depends on process conditions

Connections

Compressed air

R1/8" (BSP), internal thread. (Quick connect fittings for 1/4" tubing provided as standard)

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