Alfa Laval LKB UltraPure

Butterfly valves

Introduction

The Alfa Laval LKB UltraPure Butterfly Valve is a hygienic in-line valve for routing low and medium-viscosity liquids in stainless steel pipe systems. The LKB UltraPure 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 also be fitted with the Alfa Laval ThinkTop® V50 and V70 for sensing and control of the valve.

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, ø85 mm and ø133 mm, 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:	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):	
- ø85 mm:	0.24 x p (bar)
- ø133 mm:	0.95 x p (bar)
Weight:	
- ø85 mm:	3 kg
- ø133 mm:	12 kg

ATEX	
Classification:	II 2 G D[1]

[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

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

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

Connections	
Weld ends:[1]	Matching tubes and fittings: ISO 2037 / DIN / ASME BPE Acc. to ISO, DIN or ASME BPE
Clamp ends:	Matching tubes and fittings: ISO 2037 / DIN / ASME BPE Acc. to ISO, DIN 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)

ISO 2037 / DIN:	
Internal:	0.5 µm
ASME BPE designation:	SF1
External:	Semi-bright
ASME BPE: [1]	
Internal:	0.5 µm
ASME BPE designation:	SF1
External:	Semi-bright
ASME BPE: [1]	
Internal:	0.4 µm electro polish
ASME BPE designation:	SF4
External:	Semi-bright

[1] According to ASME BPE 2009 table SF-3

Options

- Product wetted seals: FPM (Acc. to USP Class VI), HNBR, Q and PFA.
- ThinkTop® for control and indication.[1]

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

- Indication unit with micro switches.[1]
- Indication unit with inductive proximity switches.[1]
- Indication unit with Hall proximity switches.[1]
- Explosion proof indication unit with inductive proximity switches.[1]
- Bracket for actuator.
- Handle with two or four positions.
- Handle for electrical position indication.
- Handle with infinite intermediate positions.
- Multipositioning handle.[2]
- 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.

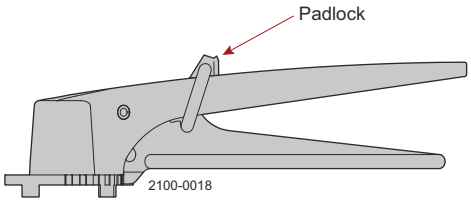


Figure 1. Lockable Multiposition Handle with padlock

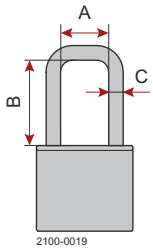


Figure 2. Dimensions - padlock

A. Min. 20 mm

B. Min. 35 mm

C. ø6 mm

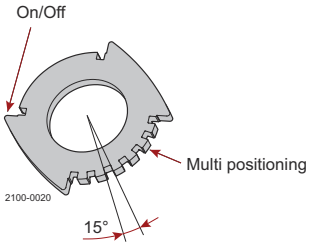


Figure 3. Positioning cap

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.

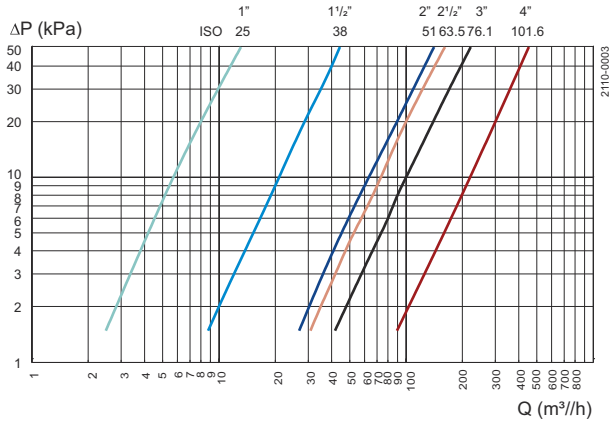
Documentation

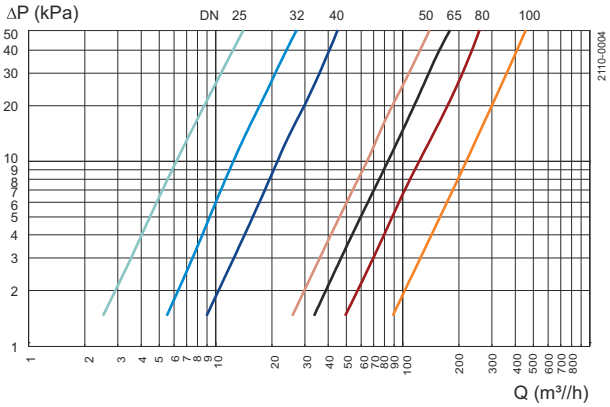
All valves are delivered with Alfa Laval Q-doc.

Note! For further details, see also ESE01699.

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

Capacity/Pressure drop diagrams





Note! For the diagrams the following applies:
Medium: Water (20 °C).
Measurement: In accordance with VDI 2173.

Torque diagrams - Actuator

LKLA ø85 mm:

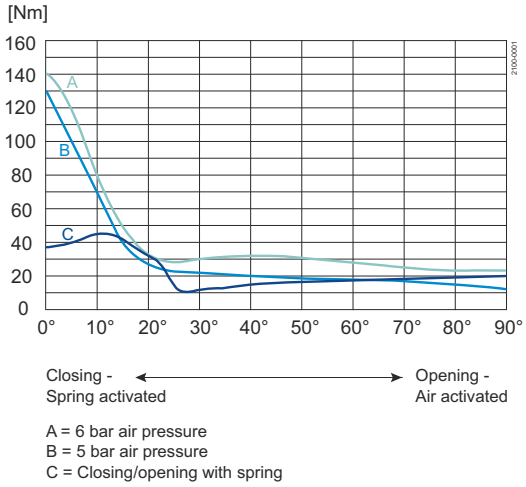


Figure 4. NC

LKLA ø133 mm:

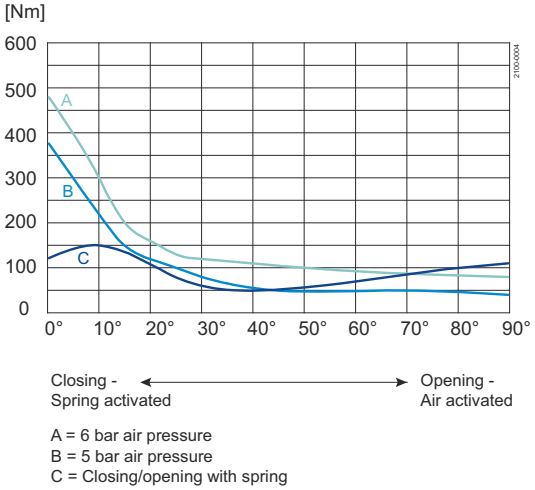


Figure 5. NC

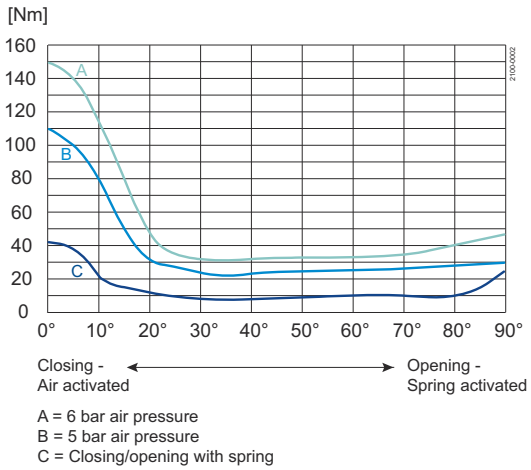


Figure 6. NO

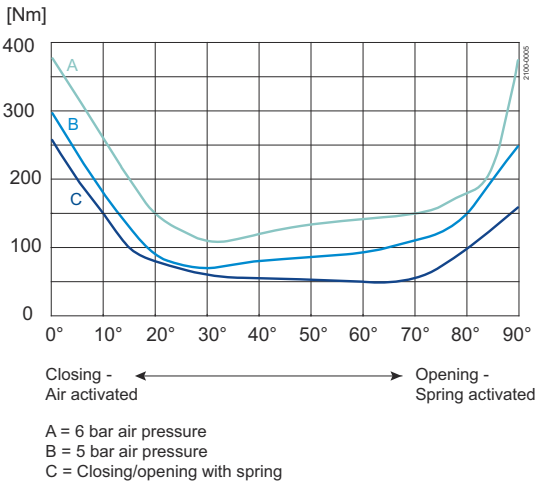


Figure 7. NO

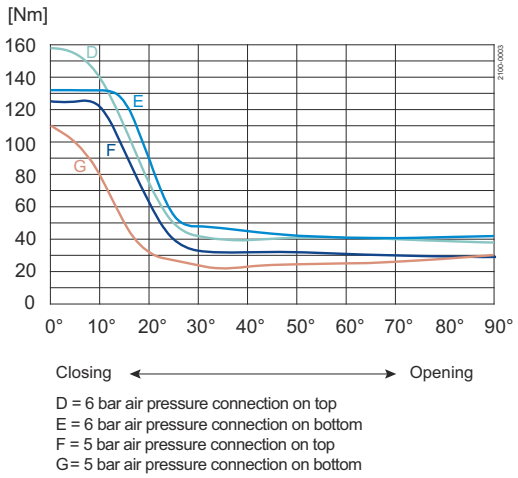


Figure 8. A/A

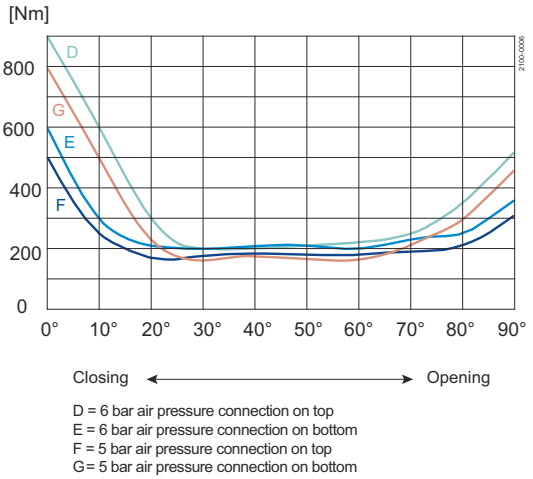


Figure 9. A/A

Alfa Laval recommends actuator size ø133 for >101.6/DN100

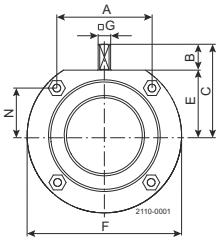
Torque values (for rotating the valve disc in a dry seal ring)

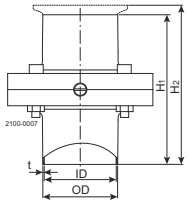
Size	Max. Nm
25mm/DN25	15
DN32	15
38mm/DN40	15

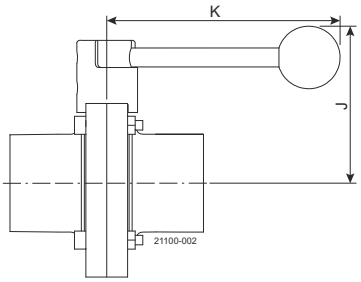
Size	Max. Nm
51mm/DN50	20
63.5mm/DN65	25
76mm/DN80	30
101.6mm/DN100	35
DN125	50
DN150	120

Dimensions (mm)

Dimensions - valve







Dimensions - actuator

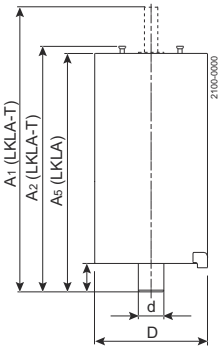


Figure 10. a. Without coupling

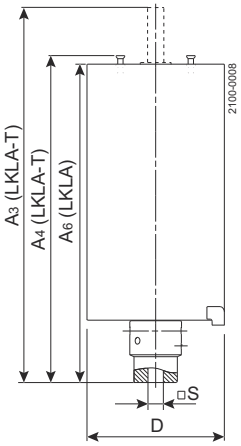


Figure 11. b. With coupling

Dimensions (mm)

LKB UltraPure

	ISO 2037						DIN						
Size	**25**	**38**	**51**	**63.5**	**76.1**	**101.6**	**DN**	**DN**	**DN**	**DN**	**DN**	**DN**	**DN**
	mm	**mm**	**mm**	**mm**	**mm**	**mm**	**25**	**32**	**40**	**50**	**65**	**80**	**100**
A	42.00	42.00	61.00	61.00	79.50	106.00	42.00	42.00	42.00	61.00	61.00	79.00	106.00
B	15.50	16.70	16.60	17.50	16.60	16.00	14.70	15.90	16.70	16.60	17.50	16.00	160.00
C	49.00	49.00	58.50	69.50	73.50	93.00	48.00	49.00	54.00	63.00	75.00	79.00	93.00
OD	25.00	38.00	51.00	63.50	76.10	101.60	29.00	35.00	41.00	53.00	70.00	85.00	104.00
ID	22.60	35.60	48.60	60.30	72.90	97.60	26.00	32.00	38.00	50.00	66.00	81.00	100.00
t	1.20	1.20	1.20	1.60	1.60	2.00	1.50	1.50	1.50	1.50	2.00	2.00	2.00
E	32.50	32.50	42.00	52.00	57.00	77.00	33.30	33.30	37.70	46.60	57.30	63.00	77.00
F	78.00	78.00	99.00	117.00	132.00	169.00	79.00	79.00	86.50	105.70	125.00	143.00	169.00
□ S	8	8	8	8	10	12	8	8	8	8	10	10	12
H1	127.00	127.00	132.00	134.00	162.00	180.00	127.00	127.00	127.00	132.00	142.00	164.00	180.00
H2	104.20	104.20	109.20	111.20	176.40	194.40	90.00	90.00	90.00	95.00	118.00	120.00	136.00
J	82.00	82.00	92.00	102.00	107.00	127.00	74.00	74.00	78.00	88.00	98.00	104.00	118.00
K	120.00	120.00	120.00	120.00	162.00	162.00	120.00	120.00	120.00	120.00	162.00	162.00	162.00
N	26.50	26.50	30.50	40.50	43.50	53.00	27.30	27.30	31.70	35.10	45.80	49.50	53.00
Weight (kg)	1.2	1.0	1.5	2.1	3.0	4.7	1.2	1.1	1.3	1.8	3.1	3.5	5.1

ASME						
Size	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**
A	42.00	42.00	61.00	61.0	79.50	105.90
B	15.50	16.70	16.60	17.50	16.61	16.00
C	49.00	49.00	58.50	69.50	73.66	93.00
OD	25.40	38.10	50.80	63.50	76.2	101.60
ID	22.10	34.80	47.50	60.20	72.90	97.00

ASME						
Size	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**
t	1.65	1.65	1.65	1.65	1.65	2.10
E	32.50	32.50	42.00	52.00	56.99	77.00
F	78.00	78.00	98.80	117.00	132.00	169.00
□ S	8.00	8.00	8.00	8.00	10.00	12.00
H_1	127.00	127.00	132.00	134.00	162.00	180.00
H_2	72.40	72.40	77.40	79.40	87.37	111.80
J	82.00	82.00	92.00	102.00	107.01	127
K	120.00	120.00	120.00	120.00	162.00	162.00
N	26.50	26.50	30.50	10.50	43.50	53.00
Weight (kg)	1.20	1.00	1.50	2.10	3.00	4.70

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

Dimensions (mm) - Actuator

LKLA and LKLA-T:

Valve	**25-63.5 mm**	**76.1 mm**	**101.6 mm**	**101.6 mm**
size	**DN25-50**	**DN65-80**	**DN100**	**DN100**
A_1	244	242	242	363
A_2	193	191	191	316
A_3	244	244	244	337
A_4	173	173	173	290
A_5	185	183	183	308
A_6	165	165	165	282
D	85	85	85	133
d	17	17	17	30
l	16.5	16.5	16.5	34
□ s	8	10	12	12
Function	NC, NO, A/A	NC, NO, A/A	NC, NO, A/A	NC, NO, A/A

Connections

Compressed air

R⅛" (BSP), internal thread.

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