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Alfa Laval Unique Mixproof Valve

One for All - Unique Mixproof

Concept

The Unique Mixproof Valve is designed with user flexibility in mind. The customer can choose additional options as required individually; for example higher hygiene demands or higher resistance against physically tough conditions. Please see next page for a graphic overview of the modularity of the Unique Mixproof Valve.

Working Principle

Unique is remote-controlled by means of compressed air. The valve is a normally closed (NC) valve.
The valve has two independent plug seals, forming a leakage chamber between them under atmospheric pressure during every working condition. In case of rare accidental leaking of product, this will flow into the leakage chamber and be discharged through the leakage outlet. When the valve is open, the leakage chamber is closed. The product can then flow from one line to the other.
The valve can be cleaned and water hammer protected to any level according to the needs in the specific process (see next page). There is virtually no spillage of product when operating the valve.

TECHNICAL DATA

Max. product pressure:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum.
Temperature range:	-5°C to +125°C (Depending on rubber quality)
Air pressure:	Max. 800 kPa (8 bar).

PHYSICAL DATA

Product wetted steel parts:	1.4404 (316L).
Other steel parts:	1.4301 (304).

Surface finish choose from the following:

Internal/external semi-bright	Ra< 1.6
Internal Bright (polished)	Ra< 0.8
Internal/external Bright (internal polished)	Ra< 0.8

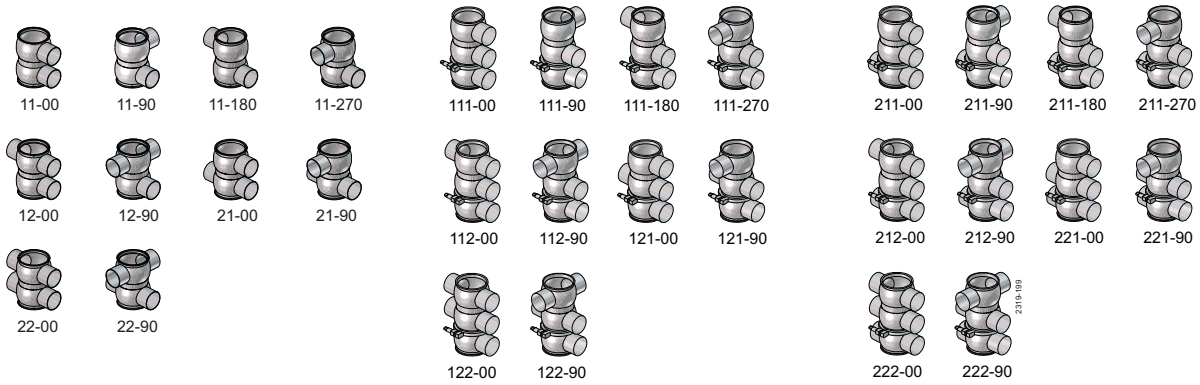
Note! The Ra values are only for the internal surface.

Product wetted seals:	EPDM.

Other seals:

CIP seals:	EPDM.
Actuator seals:	NBR.
Guide strips:	PTFE

Valve body combination



Valve body combinations, example: type 11-00

1 Number of ports - lower valve body
1 Number of ports - middle valve body
1 Number of ports - upper valve body
00 Angle between

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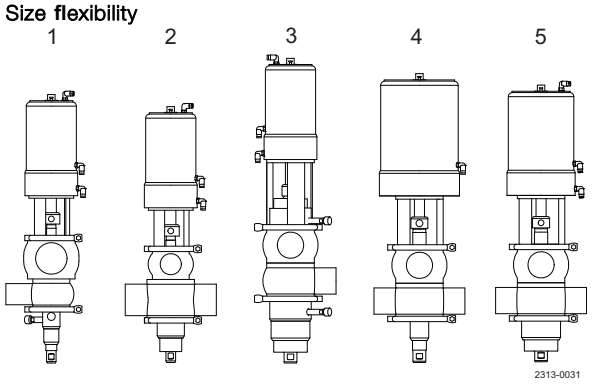
SpiralClean

The Alfa Laval SpiralClean system to clean the upper and lower balanced plugs and leakage chamber. The system cleans more efficiently, uses less cleaning fluid by ensuring that a directional flow of CIP fluid reaches all the surfaces in much less time than with conventional systems.

Selection guide

The drawings below give an overview of all options when choosing the valve to fit your process, thus demonstrating the actual flexibility of the Unique Mixproof Valve.

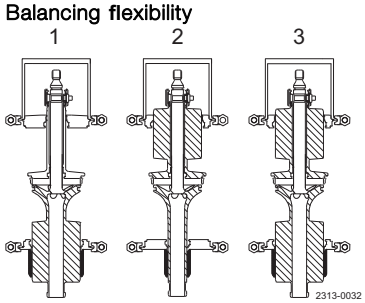
Size flexibility



The Unique Mixproof concept offers balanced and unbalanced plugs, seat lift, CIP for the plugs and leakage chambers and any combination in between.

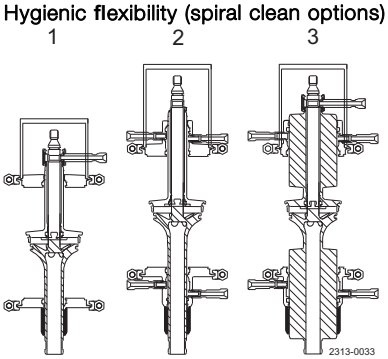
1. ISO 51 (2")/ISO 76.1 (3"), 11-90, with spiral clean on lower unbalanced plug, group 3 basic actuator incl. seat lift and seat push
2. ISO 76.1(3")/ISO 51 (2"), 22-90, with lower balanced plug, basic actuator incl. seat lift and seat push
3. ISO 76.1(3")/ISO 51 (2"), 22-90, with lower balanced plug, basic actuator incl. seat lift and seat push
4. ISO 63.5 (2½"), 22-90, with spiral clean on leakage chamber, unbalanced plugs, group 5 basic actuator
5. ISO 63.5 (2½"), 22-90, with lower balanced plug, group 4 basic actuator incl. seat lift and seat push

Balancing flexibility



1. Lower balanced plug
2. Upper balanced plug
3. Upper and lower balanced plugs

Hygienic flexibility (spiral clean options)



1. External CIP of leakage chamber
2. External CIP of upper and lower unbalanced plug
3. External CIP of leakage chamber upper and lower balanced plug

Standard configurations

To assist you in the selection we have included some standard configurations:

- Unique Basic
- Unique SeatClean
- Unique HighClean
- Unique UltraClean

You can either choose these directly or add additional features ensuring that the valve suits your specific needs.

Unique Basic has the basic components, providing significant safety and leakage detection.

- Actuator without seatlift.
- Unbalanced plugs.
- No SpiralClean of leakage chamber or plugs.
- Not applicable for 3-body version

Unique SeatClean meets the typical demands of a process valve in the food and drink industry.

- Actuator with seat lift integrated.
- Balanced lower plug, Unbalanced upper plug.
- No SpiralClean of leakage chamber or plugs.

Unique HighClean is sure to meet your processing needs when dealing with sticky products or if no recontamination can be accepted at all.

- Actuator without seatlift integrated.
- Balanced lower and upper plug.
- SpiralClean of leakage chamber as well as of upper and lower plug.
- Not applicable for 3-body version

Unique UltraClean meets the highest demands for hygienic processing. It has:

- Actuator with seat lift integrated.
- Balanced lower and upper plug.
- SpiralClean of leakage chamber, upper and lower plug.

Options

- Male parts or clamp liners in accordance with required standard.
- Control and Indication: IndiTop, ThinkTop or ThinkTop Basic.
- Side indication for detection of upper seat lift
- Product wetted seals in HNBR, NBR or FPM
- Various internal/external surface finish
- 3A (hygienic standard) on request
- Mixed housing (Not applicable for 3-body version)

Pressure drop/capacity diagrams

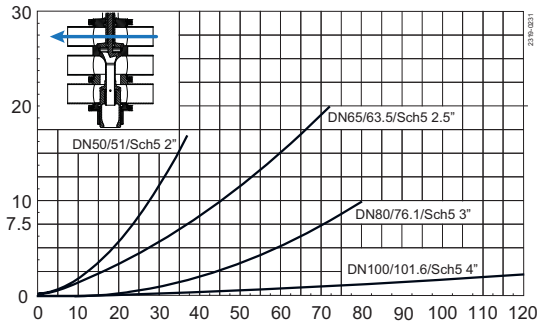


Fig. 3. Pressure drop/capacity diagram, upper body.
Full lines: Balanced upper plug.
Dotted lines: Unbalanced upper plug.

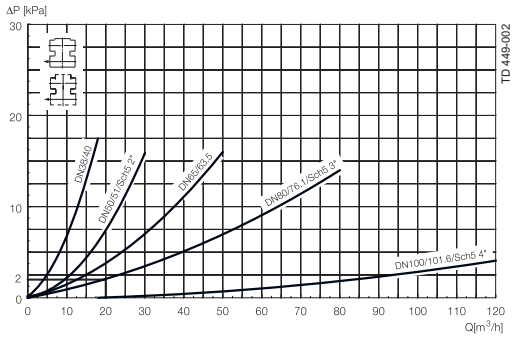


Fig. 4. Pressure drop/capacity diagram, lower body, balanced and unbalanced lower plugs.

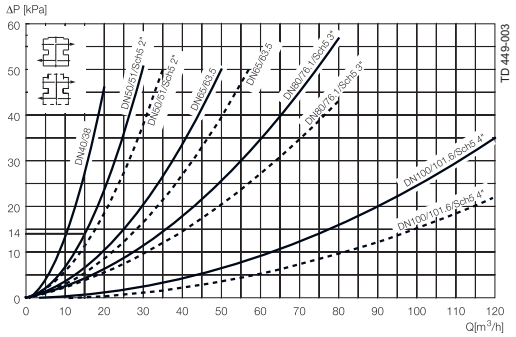


Fig. 5. Pressure drop/capacity diagram, between bodies.
Full lines: Balanced.
Dotted lines: Unbalanced.

Note! For the diagrams the following applies:

Medium: Water (20°C).
Measurement: In accordance with VDI 2173.

Example to determine pressure drop:

Upper body size: . . . . .DN/OD 51mm. Balanced upper plug.
Capacity = 20 m^3/h.
Lower body size: . . . . .DN/OD 76.1mm. Balanced lower plug.
Capacity = 20 m^3/h.
Between bodies:. . . . . .Capacity = 15 m^3/h

Result:

From fig. 3, Δp = 7.5 kPa through upper body.

From fig. 4, Δp = 2 kPa through lower body.

From fig. 5, Δp = 14 kPa seeing that:

1. The smallest body determines the curve for Δp between bodies.
2. Always choose the curve for balanced plugs if upper plug is balanced. If only lower plug is balanced, always choose the curve for unbalanced.

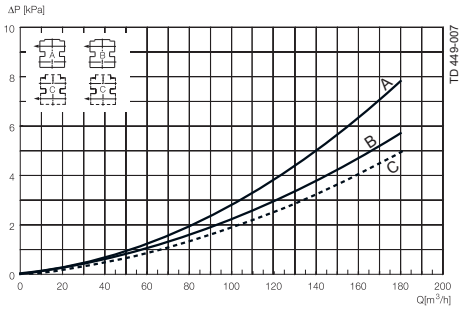


Fig.6 Pressure drop/capacity diagram, through bodies DN 125, DN 150
A: Balanced upper plug
B: Unbalanced upper plug
C: Balanced and unbalanced lower plug

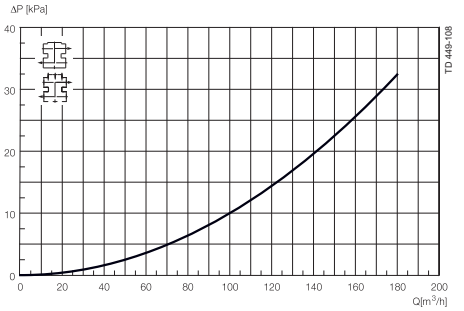


Fig.7 Pressure drop/capacity diagram between bodies
Balanced and unbalanced plugs, DN 125, DN 150

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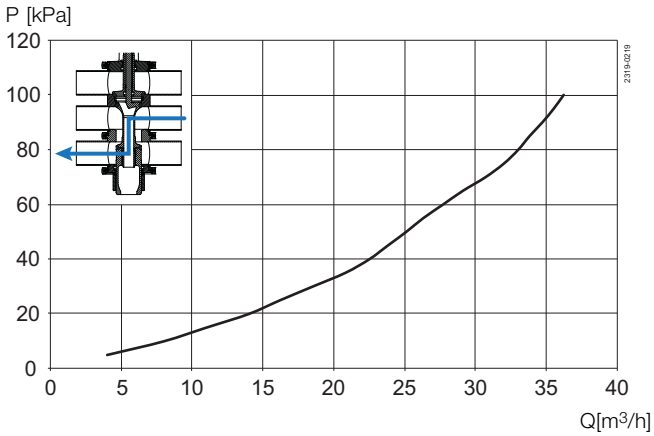
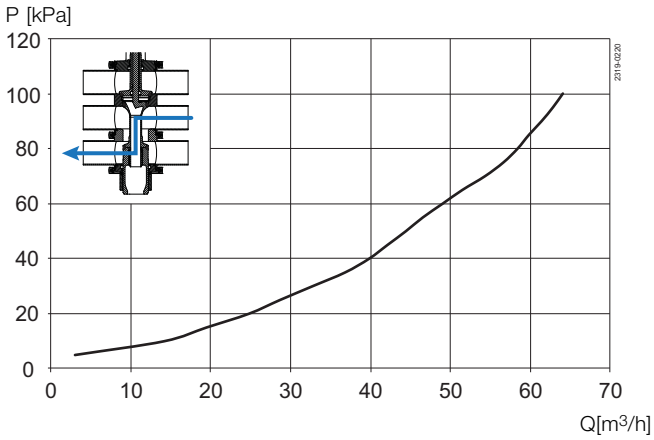
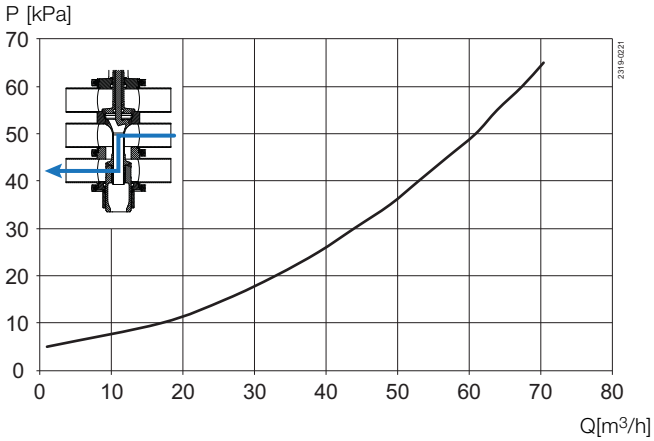
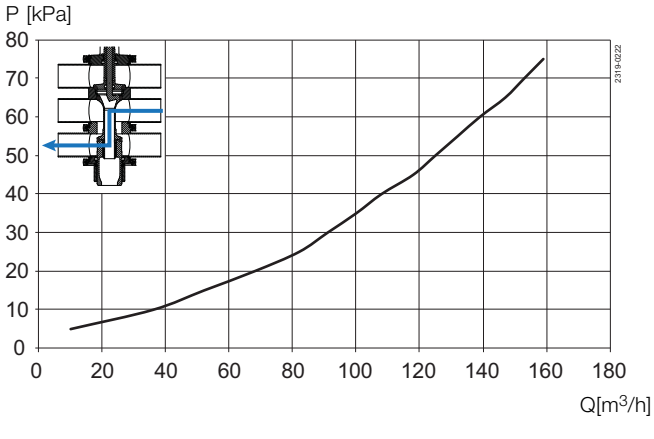
Pressure drop/capacity diagrams for 3 body valve

Between middle and lower body

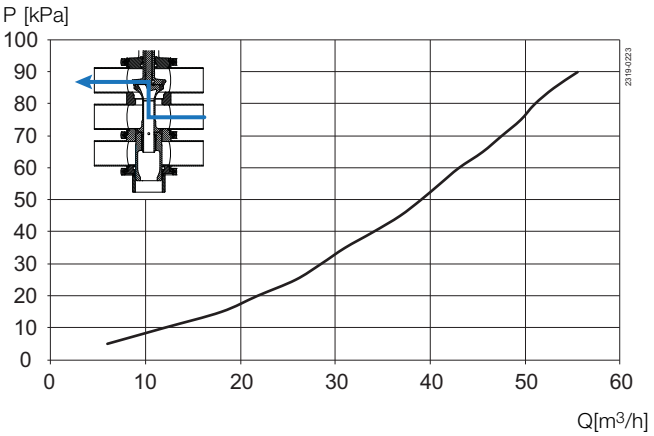


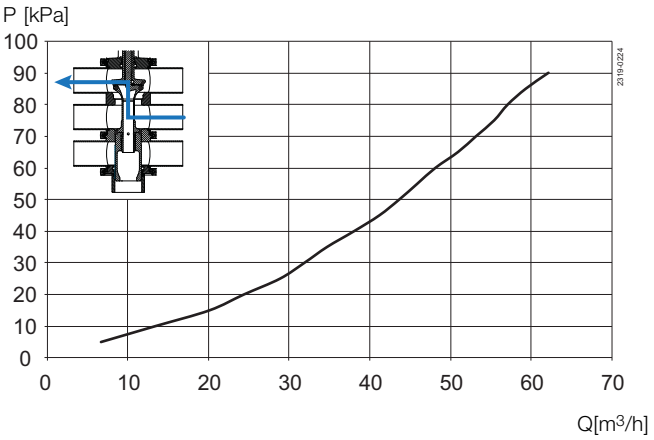


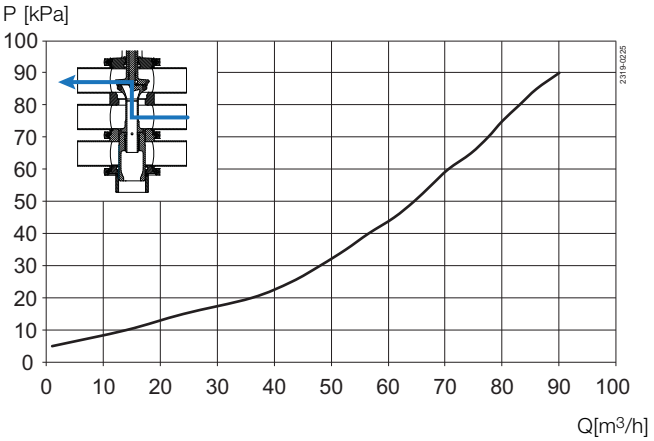


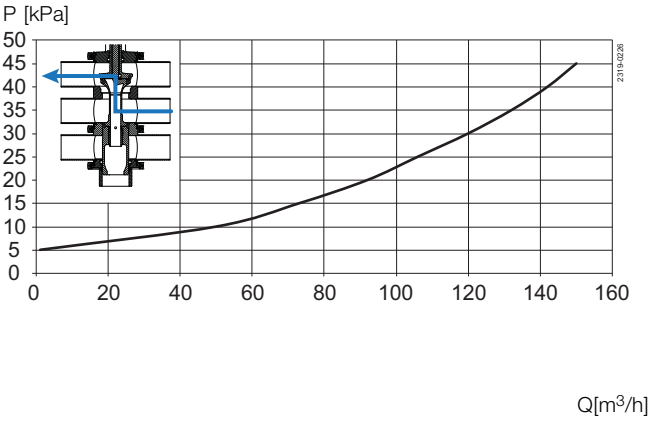


Between middle and upper body



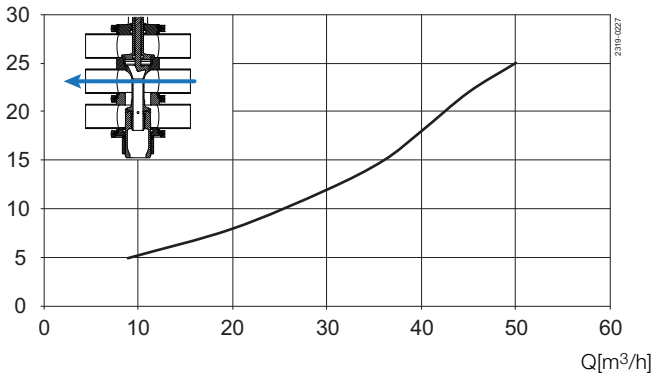




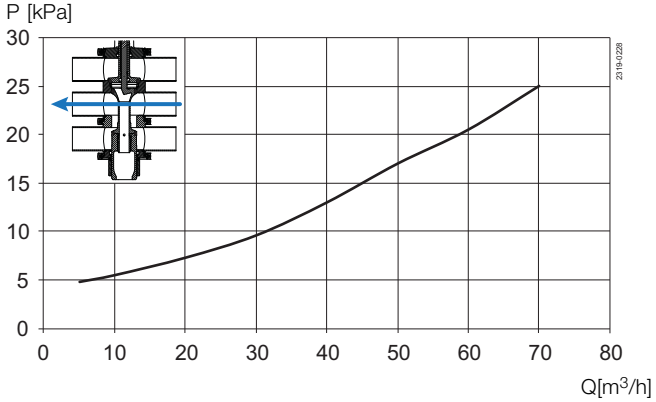


Middle body

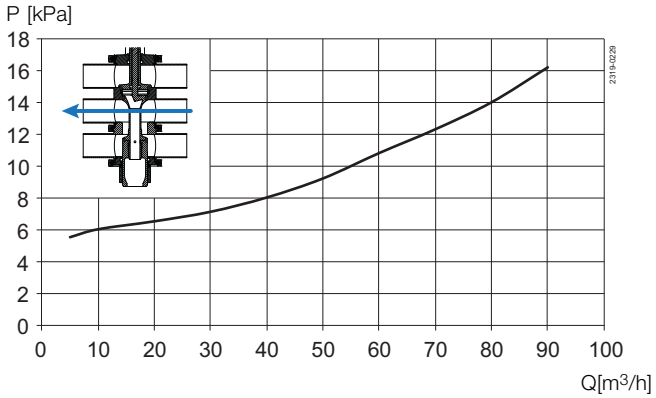
P [kPa]



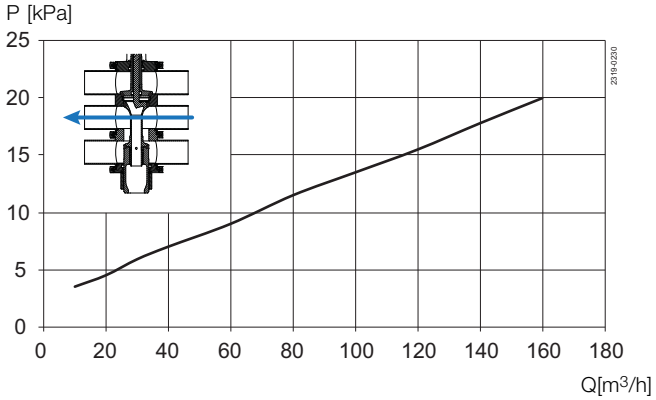
P [kPa]



P [kPa]



P [kPa]



Size			DN/OD						DN			
ISO/DIN	38	51	63.5	76.1	101.6	40	50	65	80	100	125	150
Kv-value												
Upper Seat-lift [m^3/h]	1.5	1.5	2.5	2.5	3.1	1.5	1.5	2.5	2.5	3.1	3.7	3.7
Lower Seat-lift [m^3/h]	0.9	0.9	1.9	1.9	2.5	0.9	0.9	1.9	1.9	2.5	3.1	3.1
Air consumption												
Upper Seat-lift * [n litre]	0.2	0.2	0.4	0.4	0.62	0.2	0.2	0.4	0.4	0.62	0.62	0.62
Lower Seat-lift * [n litre]	1.1	1.1	0.13	0.13	0.21	1.1	1.1	0.13	0.13	0.21	0.21	0.21
Main Movement * [n litre]	0.86	0.86	1.63	1.63	2.79	0.86	0.86	1.62	1.62	2.79	2.79	2.79
Kv-value - SpiralClean												
Spindle CIP [m^3/h]	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
External CIP of leakage chamber [m^3/h]	0.25	0.25	0.29	0.29	0.29	0.25	0.25	0.29	0.29	0.29	0.29	0.29

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Note

* [n litre] = volume at atmospheric pressure

Recommended min. pressure for SpiralClean: 2 bar.

Formula to estimate CIP flow during seat lift:
(for liquids with comparable viscosity and density to water):

$Q = Kv \cdot \sqrt{\Delta p}$

Q = CIP - flow (m^3/h).

Kv = Kv value from the above table.

Δp = CIP pressure (bar).

Actuator

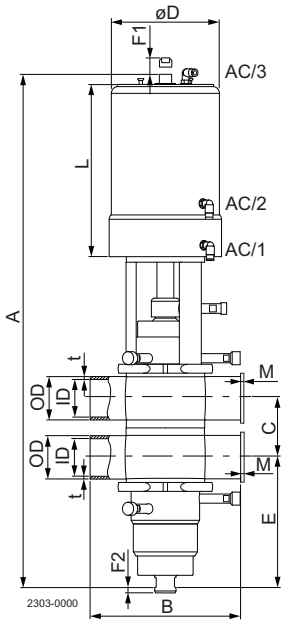
Configurator Code							STD	STD/STD*
(Ordering leaflet)		2	3	4	5	6	Operating pressure for SeatClean, High Clean and Ultra Clean at 6 bar air pressure	Operating pressure for Basic at 6 bar air pressure
Actuator Type		3	4BS[1]	4SS[2]	5BS	5SS		
Actuator dimensions		120 x	157 x	186 x	186 x	186 x		
øD x L		230	252	281	281	379		
Connection Size								
ISO (DN/OD)	DIN (DN)							
38	40	STD	OP				1000 kPa	600 kPa
51	50	STD	OP	OP			1000 kPa	600 kPa
63.5	65	OP	STD	STD*	OP	OP	1000 kPa	600 kPa
76.1	80	OP	STD	STD*	OP	OP	1000 kPa	600 kPa
101.6	100		OP	OP	STD	STD*	1000 kPa	600 kPa
	125		OP	OP	STD	STD*	800 kPa	600 kPa

STD: Normal size of actuator
STD*: Normal size actuator if lower plug is UNBALANCED
OP: Alternative size of actuator (NB: For choice and performance of optional actuators please contact Alfa Laval or refer to the Anytime Configurator).

1 BS = Basic spring
2 SS = Strong spring

Radial Seat Diameter

ISO (DN/OD)	DIN (DN)	Seat
38	40	ø53.3
51	50	ø53.3
63.5	65	ø81.3
76.1	80	ø81.3
101.6	100	ø100.3
	125	ø115.3
	150	ø115.3



Note for mixed bodies:

1. The seat always applies to the smallest valve body.
2. Dimension B is equal with the largest valve body size.

Dimensions (mm)

Size	DN/OD					DN						
ISO/DIN	**38**	**51**	**63.5**	**76.1**	**101.6**	**40**	**50**	**65**	**80**	**100**	**125**	**150**
*A - BasicClean	530	575	699	699	899	530	575	699	699	899	993	993
*A - SeatClean	530	575	670	670	791	530	575	670	670	791	895	895
*A - HighClean + UltraClean	611	656	760	760	922	611	656	760	760	922	1026	1026
B	170	220	220	220	300	170	220	220	220	300	300	300
**C	60.8	73.8	86.3	98.9	123.6	64	76	92	107	126	151	176
OD	38	51	63.5	76.1	101.6	41	53	70	85	104	129	154
ID	34.8	47.8	60.3	72.9	97.6	38	50	66	81	100	125	150
t	1.6	1.6	1.6	1.6	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0
E - Basic/SeatClean	100	121	149	142	177	99	119	146	138	176	215	202.5
E - HighClean/UltraClean	144	165	200	193	248	143	163	197	189	247	286	273.5
F1	31.5	31.5	38	38	59	31.5	31.5	38	38	59	59	59
F2	5	5	5	5	5	5	5	5	5	5	5	5
øD - Basic	120	120	186	186	186	120	120	186	186	186	186	186
øD - SeatClean, HighClean and UltraClean	120	120	157	157	186	120	120	157	157	186	186	186
L - Basic	230	230	281	281	379	230	230	281	281	379	379	379
L - SeatClean, HighClean and UltraClean	230	230	252	252	281	230	230	252	252	281	281	281
M/ISO clamp	21	21	21	21	21							
M/DIN clamp						21	21	21	21	21	28	28
M/ISO male	21	21	21	21	21							
M/DIN male						22	23	25	25	30	46	50
M/SMS male	20	20	24	24	35							
M/BS male	22	22	22	22	27							
Weight (kg) - Basic	13.5	15	24	24	34	13.5	15	24	24	34	44	45
Weight (kg) - SeatClean	13.5	15	24	24	34	13.5	15	24	24	34	47	48
Weight (kg) - High-/UltraClean	14.5	16	27	27	38	14.5	16	27	27	38	51	52

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Note! * For the A-measure if different upper/lower body sizes, please refer to Anytime configurator or contact Alfa Laval..

** The measure C can always be calculated by the formula C = ½ID_{upper} + ½ID_{lower} + 26 mm.

Dimension for 3-body version

Group	3	4	4	5	3	4	4	5
Size	DN/OD	DN/OD	DN/OD	DN/OD	DN	DN	DN	DN
ISO-DIN	51	63.5	76.1	101.6	50	65	80	100
A - without Spiral Clean	615.6	714.65	728.45	877.2	615.6	714.7	744.7	877.3
A - with Spiral Clean	696.1	804.65	818.45	1008.2	696.1	804.7	834.7	1008.3
A - Flushed	611.2	706.75	726.25	872.7	615.6	714.7	744.7	877.3
B	220	220	220	300	220	220	220	300
**C	73.8	86.3	98.9	123.6	76	92	107	126
OD	51	63.5	76.1	101.6	53	70	85	104
ID	47.8	60.3	72.9	97.6	50	66	81	100
t	1.6	1.6	1.6	2	1.5	2	2	2
E - without Spiral Clean	86.7	107.5	102.4	139.5	83.4	99.0	106.5	136.0
E - with Spiral Clean	130.2	158.0	152.9	210.5	126.9	149.5	157.0	207.0
E - Flushed	82.3	99.6	100.2	135.0	83.4	99.0	106.5	136.0
F1	31.5	38	38	59	31.5	38	38	59
F2	5	5	5	5	5	5	5	5
øD	120	157	157	186	120	157	157	186
L	230	252	252	281	230	252	252	281
M/ISO clamp	21	21	21	21				
M/DIN clamp					21	21	21	21
M/ISO male	21	21	21	21				
M/DIN male					23	25	25	30
M/SMS male	20	24	24	35				
M/BS male	22	22	22	27				

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