

One Valve for All Solutions

Unique Mixproof Valve

Concept

The exceptional concept of this mixproof valve is characterized by unmatched flexibility - yet still being very simple. The reliable modular design gives you the perfect valve for your exact needs in all mixproof operations with two different products flowing through one valve. Unique fits your process!

The unique quality of this mixproof valve is the system of combining specific features and functions from a great variety of options offered. It is exceptional in the world of mixproof valves, yet requires minimal service and maintenance.

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 fig. 2). There is virtually no spillage of product when operating the valve.

SpiralClean

The Unique concept offers the Alfa Laval SpiralClean system to clean the upper and lower balanced plugs and leakage chamber, helping to meet the high hygienic standards of the sanitary flow industry. 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. All external CIP systems for Unique includes the SpiralClean design as standard. Another benefit from the SpiralClean system is that it allows the Unique Mixproof valve to run under aseptic-like conditions. If you apply steam to the CIP pipes, this will form a steam barrier to the atmosphere.

Options

The concept of Unique is centering round the customer's needs and provides modern tailor-made solutions which are secured for the future. The customer gets exactly what he needs and only that. Only Alfa Laval offers the possibility of not choosing unnecessary features and functions, thus avoiding problems caused by a non-adapted product. 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 fig. 2 next page for a graphic overview of the modularity of this Unique Mixproof Valve.



Unique Mixproof Valve with ThinkTop®.

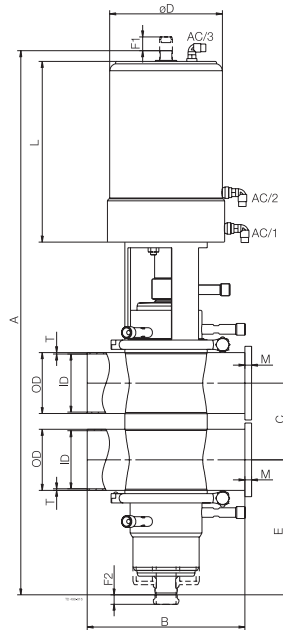


Fig. 6. Details of Unique Mixproof Valve

Dimensions (Inches)

Size ISO - Sch.5	OD 1½"	OD 2"	OD 2½"	OD 3"	OD 4"	Sch. 5 2"	Sch. 5 3"	Sch. 5 4"
*A Basic Clean	20.882	22.655	27.541	27.541	35.027	20.882	27.541	35.027
*A Seat Clean	20.882	22.655	26.398	26.398	31.165	20.882	26.398	31.165
*A High Clean/UltraClean	24.073	25.846	29.944	29.944	36.327	25.846	29.944	36.327
B	6.698	8.668	8.668	8.668	11.820	8.668	8.668	11.820
**C	2.396	2.908	3.400	3.897	4.870	3.270	4.362	5.362
OD	1.497	2.009	2.502	2.998	4.003	2.376	3.503	4.503
ID	1.371	1.883	2.376	2.872	3.845	2.246	3.336	4.337
t	0.063	0.063	0.063	0.063	0.079	0.065	0.083	0.083
E Basic/Seat Clean	3.940	4.767	5.871	5.595	6.974	4.570	5.358	6.737
E High Clean/Ultra Clean	5.674	6.501	7.880	7.604	9.771	6.304	7.368	9.535
F1	1.241	1.241	1.497	1.497	2.325	1.241	1.497	2.325
F2	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197
øD Basic	4.728	4.728	7.328	7.328	7.328	4.728	7.328	7.328
øD Seat Clean, High Clean and Ultra Clean	4.728	4.728	6.186	6.186	7.328	4.728	6.186	7.328
L Basic	9.062	9.062	11.071	11.071	14.933	9.062	11.071	14.933
L Seat Clean, High Clean and Ultra Clean	9.062	9.062	9.929	9.929	11.071	9.062	9.929	11.071
M/Tri-clamp	0.827	0.827	0.827	0.827	0.827			
Weight (lb) Basic	30	33	53	53	75	33	53	75
Weight (lb) SeatClean	30	33	53	53	75	33	53	75
Weight (lb) High-/UltraClean	32	35	59	59	84	35	59	84

Note!

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

** The measure C can always be calculated by the formula $C = \frac{1}{2}ID_{upper} + \frac{1}{2}ID_{lower} + 26 \text{ mm}$.

Selection guide

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.

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

- Actuator without seatlift.
- Unbalanced plugs.
- No **SpiralClean** of leakage chamber or plugs.

Typical applications could be water inlet for water push of product or CIP supply and return lines. Not suitable in application with risk of pressure shocks or sticky products. Unique Basic Mixproof Valve is for low cost solutions.

Unique SeatClean meets the typical demands of a process valve in the food and drink industry. It is also suitable for products with solids. Cleaning of the plugs and seats are performed by means of seatlift during normal cleaning procedure. This valve also includes a balanced lower plug that eliminates the risk of mixing products by pressure shock or when the pressure in the pipe is high. Its features are:

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

Unique SeatClean is the choice for standard solutions.

Unique HighClean is sure to meet your processing needs when dealing with sticky products or if no recontamination can be accepted at all, as the valve can be provided with **SpiralClean** both around spindles and in leakage chamber. The valve is characterized by:

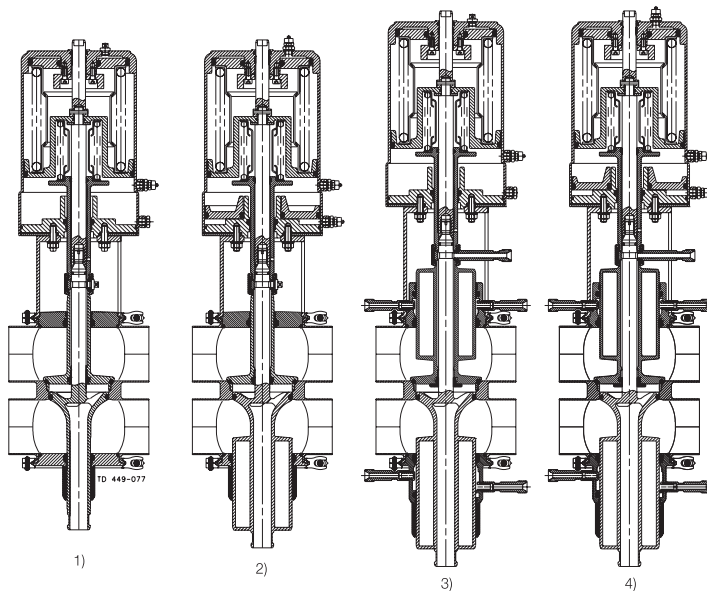
- Actuator without seatlift integrated.
- Balanced lower and upper plug.
- **SpiralClean** of leakage chamber as well as of upper and lower plug.

With balanced plugs, the configuration of this valve protects against high pressure and water hammer effect.

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.

During the cleaning process, the plugs are lifted independently to ensure cleaning of plugs and seats together with their corresponding pipe. At the same time or separately the leakage chamber and balanced plugs are cleaned with our **SpiralClean** system. The Unique UltraClean also protects against high pressure and water hammer effect. It has few product wetted seals and allows no product spillage during operation. The Unique UltraClean mixproof valve is the choice for solutions requiring the highest level of hygiene. The UltraClean is suitable for applications with sticky products, products with high content of solids or applications where "close to aseptic conditions" is wanted.



1. Unique Basic
2. Unique SeatClean
3. Unique HighClean
4. Unique UltraClean

Pressure drop/capacity diagrams

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

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

Example to determine pressure drop:

Upper body size: 2". Balanced upper plug.
 Capacity = 80 gpm.
 Lower body size: 3". Balanced lower plug.
 Capacity = 80 gpm.
 Between bodies: 3". Balanced lower plug.
 Capacity = 60 gpm.

Result:

From fig. 3, $\Delta p = 0.9$ psi through upper body.

From fig. 4, $\Delta p = 0.25$ psi through lower body.

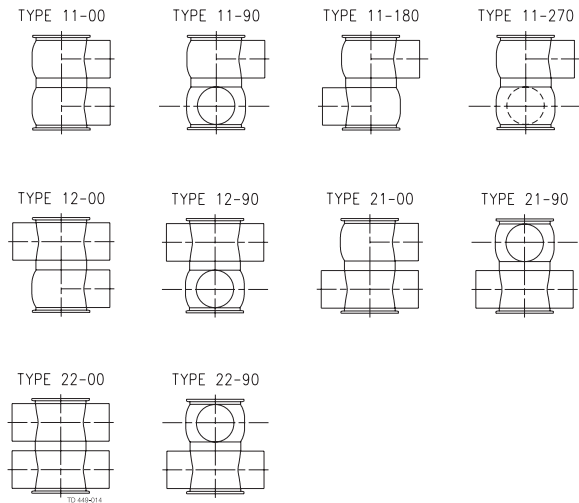
From fig. 5, $\Delta p = 1.7$ psi seeing that:
 1. The smallest body determines the curve for Δp between bodies.
 2. Always choose the curve for balanced plugs if upper plug is balanced. If only lower plug is balanced, always choose the curve for unbalanced.

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

Note! For the diagrams the following applies:

Medium: Water (68°F).
 Measurement: In accordance with VDI 2173.

Valve body combinations



The drawing below gives an overview of all options when choosing the valve to fit your process, thus demonstrating the actual flexibility of the Unique Mixproof Valve. You can either choose these directly or add additional features ensuring that the valve suits your specific needs.

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

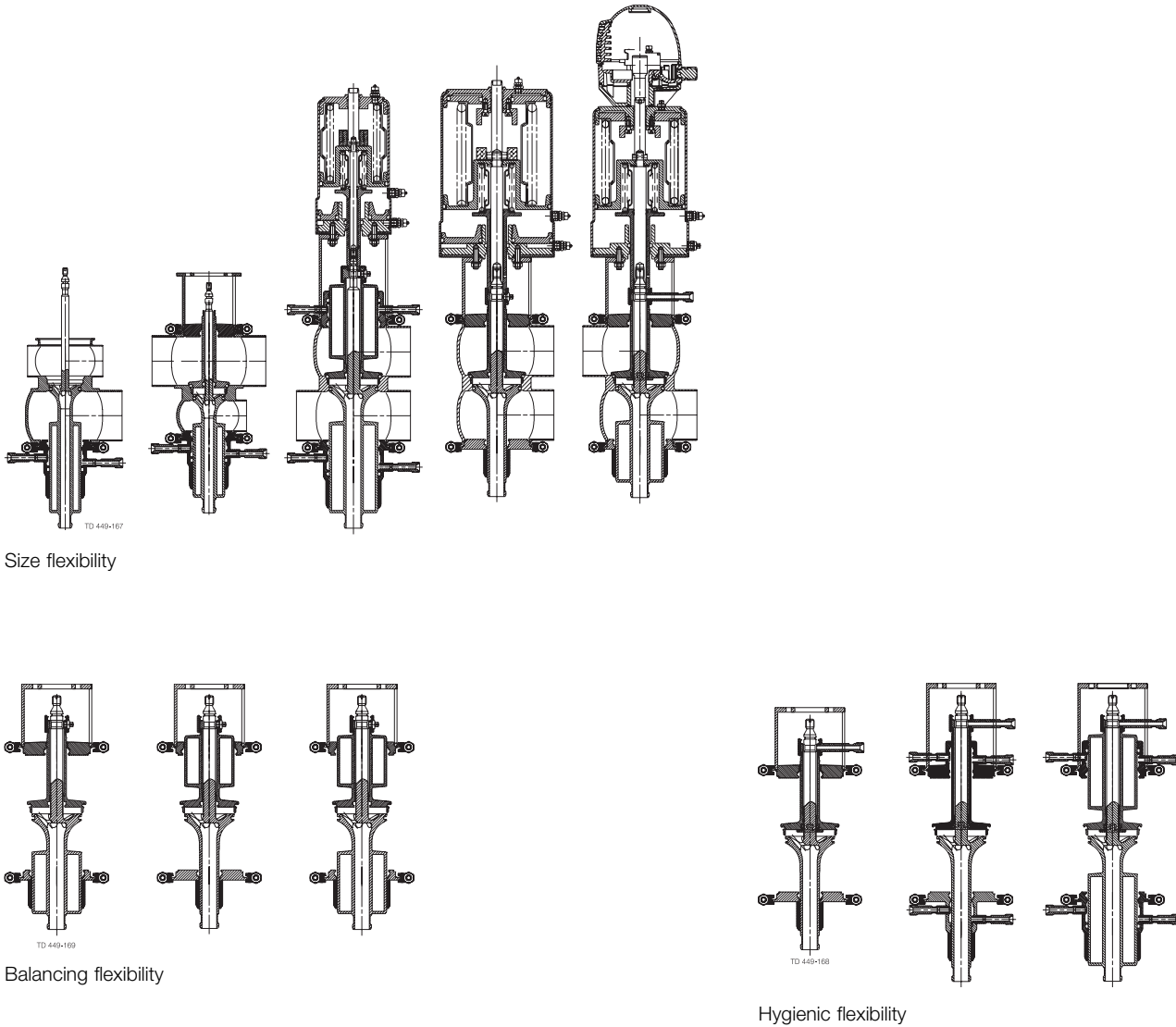


Fig. 2. Maximum flexibility option sheet.

Flexible Design Features

- Excellent flexibility - though simple.
- Adaption to all working conditions by combining components.
- Logically structured maintenance and valve assembly.
- Adaption and/or up-/downgrading on site.
 - a. Easy troubleshooting.
 - b. Secured for future changes in working conditions.

Technical Data

Max. product pressure:140 psi (for higher pressure, please ask Alfa Laval)
 Min. product pressure:Full vacuum.
 Temperature range:23°F to +257°F (Depending on seal material)
 (For higher temperature, please ask Alfa Laval)
 Air pressure:116 psi

Materials

Product wetted steel parts:Acid-resistant steel AISI 316L
 Other steel parts:Stainless steel AISI 304
 Product wetted parts:EPDM, HNBR, NBR or FPM
 Other seals:CIP seals: EPDM.
 Actuator seals: NBR.
 Finish - choose from the followingInternal/external Matt (blasted) Ra<64µ"
 Internal Bright (polished) Ra<32µ"
 Internal/external Bright (internal polished) Ra<32µ"
Note! The Ra values are only for the internal surface.

Actuator

Configurator Code (Ordering leaflet)						STD	STD/STD*
	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 øD x L	4.72 x 9.06	6.18 x 9.92	7.32 x 11.06	7.32 x 11.06	7.32 x 14.92		
Tube OD Sch.5							
1½"	STD	OP	OP			140	87
2"	STD	OP	OP			140	87
2½"	OP	STD	STD*	OP	OP	140	87
3"	OP	STD	STD*	OP	OP	140	87
4"		OP	OP	STD	STD*	116	87

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 CAS Configurator).

1 BS = Basic spring

2 SS = Strong spring

Recommended min. pressure for SpiralClean: 29 psi.

Formula to estimate CIP flow during seat lift:

(for liquids with comparable viscosity and density to water):

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

Q = CIP - flow (gpm)

Kv = Cv value from the above table.

Δp =CIP pressure (psi)

Assumption: Density = 1

Size ISO - Sch.5	OD 1½"	OD 2"	OD 2½"	OD 3"	OD 4"	Sch. 5 2"	Sch. 5 3"	Sch. 5 4"
Cv-value Upper Seat-lift [gpm/psi]	2.9	2.9	4.3	4.3	5.3	2.9	4.3	5.3
Cv-value Lower Seat-lift [gpm/psi]	2.2	2.2	3.6	3.6	4.9	2.2	3.6	4.9
Air consumption Upper Seat-lift * [cubic inches]	12	12	24	24	38	12	24	38
Air consumption Lower Seat-lift * [cubic inches]	67	00:00	8	8	13	67	8	13
Air consumption Main Movement * [cubic inches]	52	00:00	99	99	170	52	99	170
Cv-value SpiralClean Spindle CIP [gpm/psi]	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Cv-value SpiralClean External CIP of leakage chamber [gpm/psi]	0.29	0.29	0.34	0.34	0.34	0.29	0.34	0.34

Options

ThinkTop® control & Indication unit

Ordering

For ordering, either refer to CAS configurator.