Large particles - Gentle Handling

Alfa Laval Unique Mixproof Large Particle Valve (Unique LP)

Concept

This Unique Mixproof LP valve is based on the well proven and exceptionally flexible design of the Unique Mixproof valves. The valves are designed for gentle handling of the product containing large particulates up to 1¾" (45 mm) or products with high viscosity.

Working principle

Unique Mixproof LP is remote-controlled by means of compressed air. The valve is a normally closed (NC) valve. It is as standard supplied seat lift, which enables handling of two different products at the same time, or safe handling of one product while seat-lift cleaning operations are being conducted in the other portion of the valve – all without any risk of cross-contamination.

The 6" valve is as standard also equipped with balanced lower plug to protect against the effects of high pressure and water hammer. The 4" valve is, in order to accommodate 1½" (45mm) particles, not supplied with balanced lower plug. The 4" is however as standard equipped with a boost actuator to accommodate a product pressure of up to 10 bar.

Technical Data

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

Authorized to carry the 3A symbol

Materials

Product wetted steel parts: 1.4404 (316L)
Other steel parts: 1.4301 (304)
External surface finish . Semi-bright (blasted)
Internal surface finish . . Bright (polished), Ra < 1.6 µm
Product wetted parts: . EPDM

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

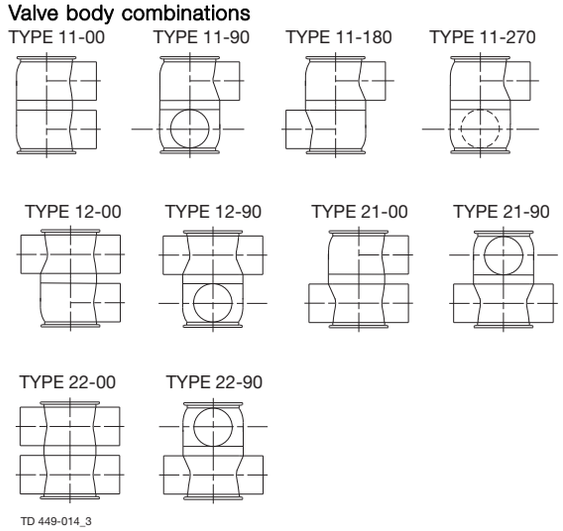
Availability

This LP edition of the Unique Mixproof valve is a high-end valve with regards to process security as well as from a hygienic point of view. The Unique Mixproof LP valve is available in 4" and 6" sizes.

Options

- Male parts or clamp liners in accordance with required standard.
- Control and Indication: ThinkTop or ThinkTop Basic.
- Side indication for detection of upper seat lift
- Product wetted seals in HNBR, NBR or FPM

Valve body combinations



Pressure drop/capacity diagrams

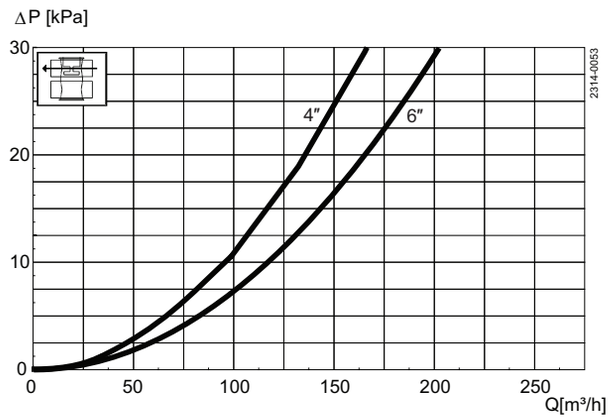


Fig. 2. Pressure drop/capacity diagram, upper bodies.

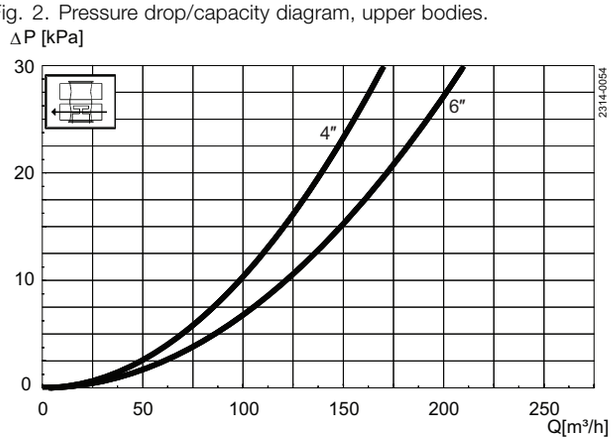


Fig. 4. Pressure drop/capacity diagram, lower body.

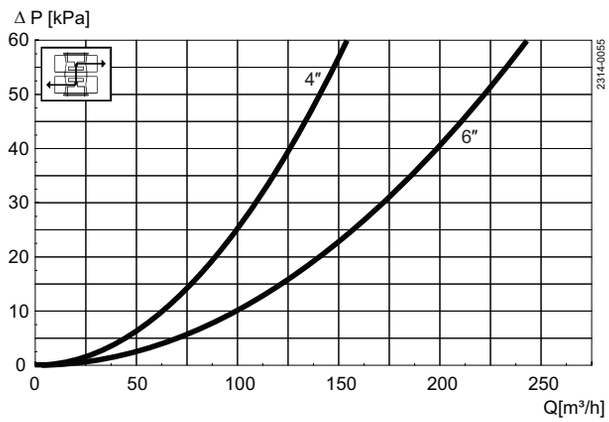


Fig. 3. Pressure drop/capacity diagram, between bodies.

Note!

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

2.6

Air and CIP consumption

Size		OD 4"	OD 6"
Kv-value			
Upper Seat-lift	[m^3/h]	3.2	7.1
Lower Seat-lift	[m^3/h]	2.9	6.0
Air consumption			
Upper Seat-lift	* [n litre]	0.62	0.62
Lower Seat-lift	* [n litre]	0.21	0.21
Main Movement	* [n litre]	3.54	3.54

Note

* [n litre] = volume at atmospheric pressure

Formula to estimate CIP flow during seat lift:

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

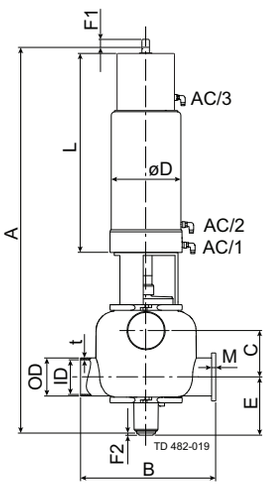
$Q = Kv \cdot \sqrt{\Delta p}$

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

Kv = Kv value from the above table.

Δ p = CIP pressure (bar).

Dimensions



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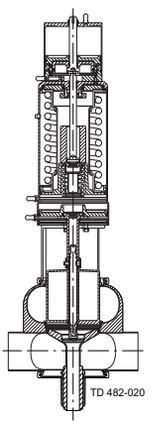

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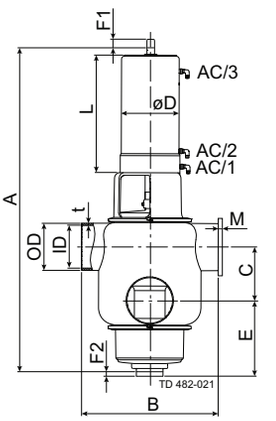
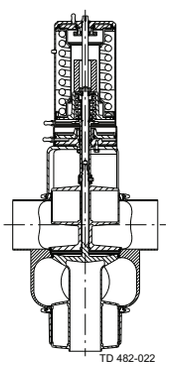


6”



6”

Size	4"	6"
A	1038.00	1002.00
B	350.00	440.00
**C	123.60	172.67
OD	101.60	152.40
ID	97.60	146.86
t	2.00	2.77
E	166.00	211.00
F1	75.00	75.00
F2	5.00	5.00
øD	186.00	186.00
L	534.00	379.00
M/Tri-clamp	21.00	38.60
Weight (kg)	64.90	86.20

NOTE!

**The measure C can always be calculated by the formula

$C = ½ID\text{-}_{upper} + ½ID\text{-}_{lower} + 26mm$.

Large Particle - Gentle Handling

Alfa Laval Unique Mixproof Large Particle Valve (Unique LP-F)

Concept

This Unique Mixproof LP-F valve is based on the well proven and exceptionally flexible design of the Unique Mixproof valves. The valves are designed for gentle handling of the product containing large particulates up to 45 mm or products with high viscosity.

Additional to the Unique Mixproof Large Particle valve (LP) the LP-F is equipped with a lower flush to enable 100% cleanability of the lip seal in the lower sealing element through seat-lift cleaning alone. This an improved performance compared to Spiral clean on the lower plug and reduces the need for additional utility installations for external CIP.

Working Principle

Unique Mixproof LP-F is remote-controlled by means of compressed air. The valve is a normally closed (NC) valve. It is as standard supplied seat lift, which enables handling of two different products at the same time, or safe handling of one product while seat-lift cleaning operations are being conducted in the other portion of the valve – all without any risk of cross-contamination. The 6” valve is as standard also equipped with balanced lower plug to protect against the effects of high pressure and water hammer. The 4” valve is, in order to accommodate 45mm particles, not supplied with balanced lower plug. The 4” is however as standard equipped with a boost actuator to accommodate a product pressure of up to 10 bar. When seat lift of the lower plug is performed the valve will simultaneously clean the lower plug seal as well as the lover sealing element lip seal.

Technical Data

Max. product pressure: .1000 kPa (10 bar)
Min. product pressure: .Full vacuum.
Temperature range: . . . .-5 °C to +125 °C (Depending on elastomer type)
(For higher temperatures, please contact Alfa Laval)
Air pressure: . . . . . .Max. 8 bar

Authorized to carry the 3A symbol

Materials

Product wetted steel parts: 1.4404 (316L)
Other steel parts: 1.4301 (304)
External surface finish . Semi-bright (blasted)
Internal surface finish . . Bright (polished), Ra < 1.6 µm
Product wetted parts: . EPDM

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

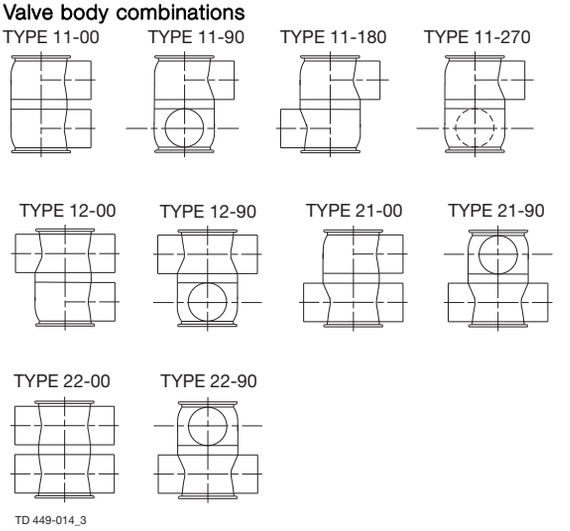
Availability

This LP-F edition of the Unique Mixproof valve is a high-end valve with regards to process security as well as from a hygienic point of view. The Unique Mixproof LP-F valve is available in 4" and 6" sizes.

Options

- Male parts or clamp liners in accordance with required standard.
- Control and Indication: ThinkTop or ThinkTop Basic.
- Side indication for detection of upper seat lift
- Product wetted seals in HNBR, NBR or FPM

Valve body combinations



Pressure drop/capacity diagrams

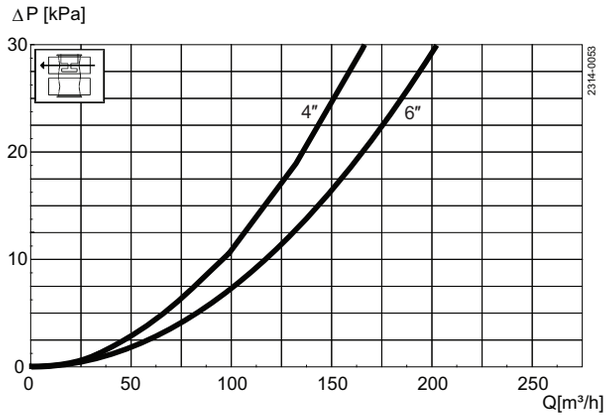


Fig. 2. Pressure drop/capacity diagram, upper bodies.

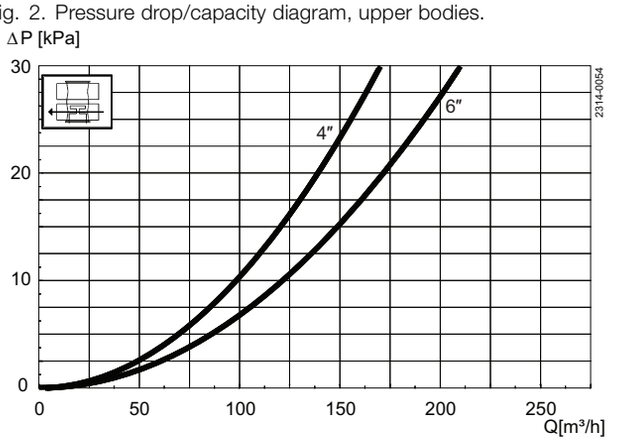


Fig. 4. Pressure drop/capacity diagram, lower body.

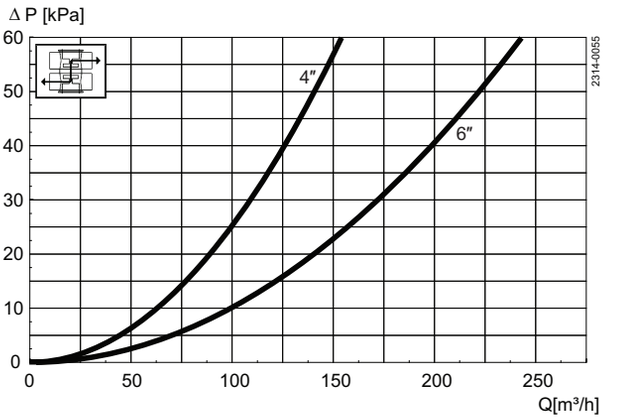


Fig. 3. Pressure drop/capacity diagram, between bodies.

Note!

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

Air and CIP consumption

Size		OD 4"	OD 6"
Kv-value			
Upper Seat-lift	[m^3/h]	3.2	7.1
Lower Seat-lift	[m^3/h]	3.9	8.9
Air consumption			
Upper Seat-lift	* [n litre]	0.62	0.62
Lower Seat-lift	* [n litre]	0.21	0.21
Main Movement	* [n litre]	3.54	3.54

Note

* [n litre] = volume at atmospheric pressure

Formula to estimate CIP flow during seat lift:

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

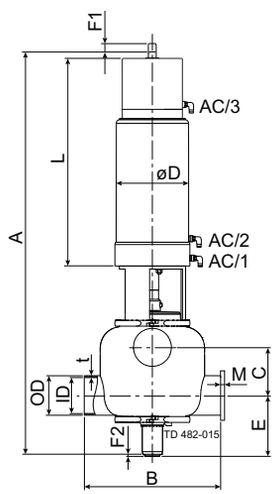
$Q = Kv \cdot \sqrt{\Delta p}$

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

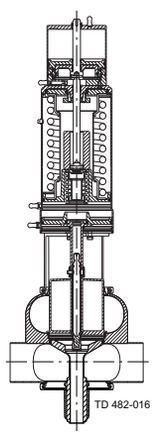
Kv = Kv value from the above table.

Δ p = CIP pressure (bar).

Dimensions [mm]



4”



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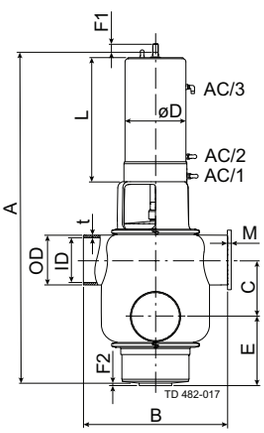
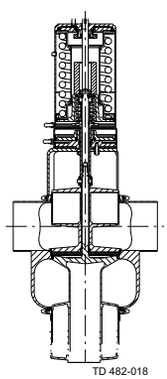


6”



6”

Size	4"	6"
A	1038.00	1002.00
B	350.00	440.00
**C	123.60	172.67
OD	101.60	152.40
ID	97.61	146.86
t	2.00	2.77
E	166.00	210.80
F1	75.00	75.00
F2	5.00	5.00
øD	186.00	186.00
L	534.00	379.00
M/Tri-clamp	21.00	38.60
Weight (kg)	64.90	86.20

NOTE!

**The measure C can always be calculated by the formula

$C = ½ID\text{-}_{upper} + ½ID\text{-}_{lower} + 26mm$.

One for All - Unique Mixproof

Alfa Laval Unique Mixproof Tank Outlet Valve (Unique-TO)

2.6

Concept

The exceptional concept of this mixproof valve is characterized by excellent unmatched flexibility - yet still being very simple. The modular design gives you the perfect valve for your exact needs in all mixproof tank outlet operations allowing two different products in pipeline and tank.

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. In the leakage chamber there is only 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 tank to pipeline.
The valve is water hammer protected in the pipeline due to the balanced plug that prevent the plug from closing too fast, when closing in the direction of product flow.
The valve can be cleaned to any level according to the needs in the specific process. There is virtually no spillage of product when operating the valve.

TECHNICAL DATA

Max. product pressure in pipeline: . . . . . .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).

CERTIFIED EHEDG TYPE EL OCTOBER 2008

PHYSICAL DATA

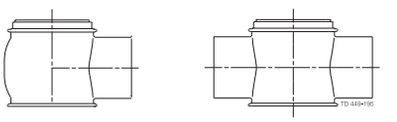
Product wetted steel parts: . . . . . 1.4404 (316L).
Other steel parts: . . . . . 1.4301 (304).

Surface finish - choose from the following:
Internal/external Matt (blasted) . . . . . 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 Combinations



Type 20 Type 30

Standard design

The valve consists of one valve body, which is connected to either a tank flange or a stub flange with a clamp.
The body can be turned in any position if the clamp is slightly loosened.
The tank flange is welded directly into the tank. (Important! Observe welding guideline in instruction manual).
The tank flange is supplied with TÜV approval AD 2000 and inspection certificate 3.1 according to EN10204.
The design allows the Unique-TO to be installed in a horizontal position.

SpiralClean

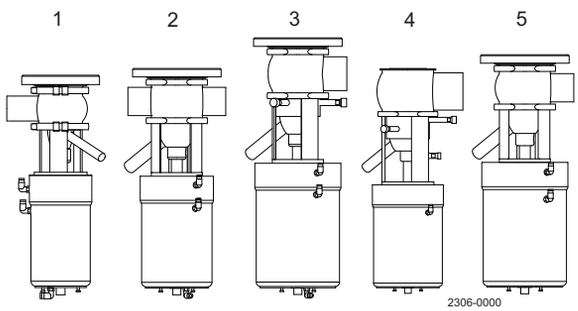
The Alfa Laval SpiralClean system to clean the balanced plug and leakage chamber.
The system cleans more efficiently, uses less cleaning fluid by ensuring that a directional flow of CIP fluid reaches all the surfaces in much less time than with conventional systems.

Selection guide

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

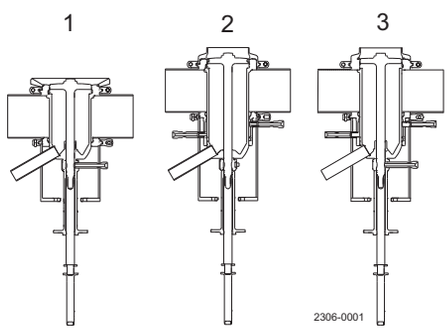
The Unique-TO concept offers balanced plug in pipe line, seat lift, CIP for the plugs and leakage chambers and any combination in between.

Unique-TO size flexibility



1. DN50 with tank flange, group 3 actuator including seat lift and seat push
2. ISO63.5 (2½") with tank flange, group 4 basic actuator including seat lift and seat push
3. ISO76.1 (3") with spiral on upper balanced plug and tank flange, group 5 basic actuator including seat lift and seat push
4. DN150 with spiralclean on leakage chamber upper balanced plug and group 4 basic actuator
5. ISO 63.5 (2½") with tank flange, group 4 basic actuator including seat lift

Unique-TO hygienic flexibility (spiral clean options)



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

Standard configurations

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

- Unique-TO
- Unique-TO with external cleaning.

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

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

- Actuator with seat lift integrated.
- Standard balanced plug in pipeline.

Unique-TO with external cleaning meets the highest demands for hygienic processing.

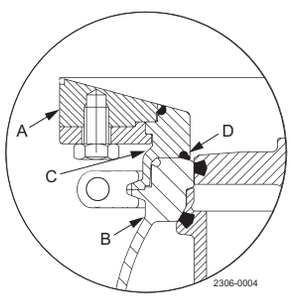
- Actuator with seat lift integrated.
- Standard balanced plug in pipeline.
- SpiralClean of leakage chamber and balanced plug

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
- Blind flange
- Conversion flange that enables replacement of an SMP-TO valve though reusing the existing SMP-TO tank flange - see fig. 1.
- Tank connection supplied separately

Fig. 1

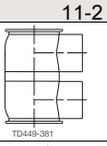
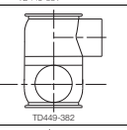
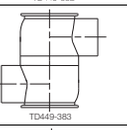
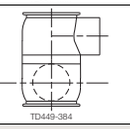
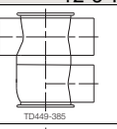
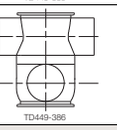
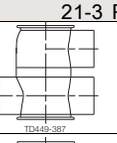
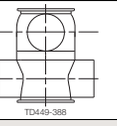
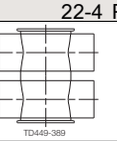
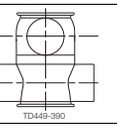
Converting from SMP-TO valve to Unique-TO valve in tank flange



A. SMP-TO tank flange
B. Unique Mixproof TO valve
C. Conversion flange
D. O-ring for conversion flange
When Unique-TO is mounted on a SMP-TO flange via the Alfa Laval conversion flange add 28 mm to valve height dimensions (A1-A4)

Air-operated valves
Upper and lower seat lift
No SpiralClean
Balanced upper
Balanced lower (6" only)
Product code: 5350

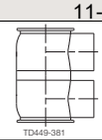
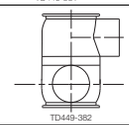
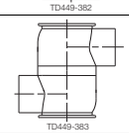
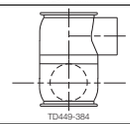
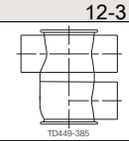
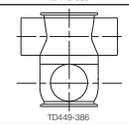
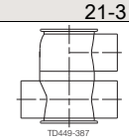
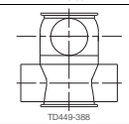
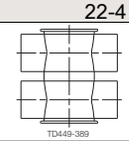
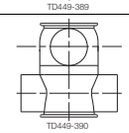
Material: 1.4404 (316L)
Connection: Welding ends
Seals: See below
Inside surface finish: Polished, Ra <1.6 µm
Outside surface finish: Blasted
Automation: Pneumatic NC

NBR	PPL EUR	HNBR	PPL EUR	EPDM	PPL EUR	FPM	PPL EUR	Size	Port Angle	Body combination
										11-2 Ports
9614096501 9614096541	**10607** **14346**	9614096511 9614096551	**10702** **14562**	9614096521 9614096561	**10607** **14346**	9614096531 9614096571	**10702** **14562**	4" 6”	00° 00°	 TD449-381
9614096502 9614096542	**10607** **14346**	9614096512 9614096552	**10702** **14562**	9614096522 9614096562	**10607** **14346**	9614096532 9614096572	**10702** **14562**	4" 6”	90° 90°	 TD449-382
9614096503 9614096543	**10607** **14346**	9614096513 9614096553	**10702** **14562**	9614096523 9614096563	**10607** **14346**	9614096533 9614096573	**10702** **14562**	4" 6”	180° 180°	 TD449-383
9614096504 9614096544	**10607** **14346**	9614096514 9614096554	**10702** **14562**	9614096524 9614096564	**10607** **14346**	9614096534 9614096574	**10702** **14562**	4" 6”	270° 270°	 TD449-384
										12-3 Ports
9614096505 9614096545	**10700** **14505**	9614096515 9614096555	**10792** **14722**	9614096525 9614096565	**10700** **14505**	9614096535 9614096575	**10792** **14722**	4" 6”	00° 00°	 TD449-385
9614096506 9614096546	**10700** **14505**	9614096516 9614096556	**10792** **14722**	9614096526 9614096566	**10700** **14505**	9614096536 9614096576	**10792** **14722**	4" 6”	90° 90°	 TD449-386
										21-3 Ports
9614096507 9614096547	**10504** **14264**	9614096517 9614096557	**10599** **14482**	9614096527 9614096567	**10504** **14264**	9614096537 9614096577	**10599** **14482**	4" 6”	00° 00°	 TD449-387
9614096508 9614096548	**10700** **14505**	9614096518 9614096558	**10792** **14722**	9614096528 9614096568	**10700** **14505**	9614096538 9614096578	**10792** **14722**	4" 6”	90° 90°	 TD449-388
										22-4 Ports
9614096509 9614096549	**10894** **14748**	9614096519 9614096559	**10989** **14964**	9614096529 9614096569	**10894** **14748**	9614096539 9614096579	**10989** **14964**	4" 6”	00° 00°	 TD449-389
9614096510 9614096550	**10894** **14748**	9614096520 9614096560	**10989** **14964**	9614096530 9614096570	**10894** **14748**	9614096540 9614096580	**10989** **14964**	4" 6”	90° 90°	 TD449-390

Unique Mixproof Large Particle Valve (Unique LP-F)

Air-operated valves
Upper and lower seat lift
No SpiralClean
Balanced upper
Balanced lower (6" only)
Product code: 5350

Material: 1.4404 (316L)
Connection: Welding ends
Seals: See below
Inside surface finish: Polished, Ra <1.6 µm
Outside surface finish: Blasted
Automation: Pneumatic NC

NBR	PPL EUR	HNBR	PPL EUR	EPDM	PPL EUR	FPM	PPL EUR	Size	Port Angle	Body combination
										11-2 Ports
9614096601 9614096641	**12405** **16530**	9614096611 9614096651	**12498** **16748**	9614096621 9614096661	**12405** **16530**	9614096631 9614096671	**12498** **16748**	4" 6"	00° 00°	 TD449-381
9614096602 9614096642	**12405** **16530**	9614096612 9614096652	**12498** **16748**	9614096622 9614096662	**12405** **16530**	9614096632 9614096672	**12498** **16748**	4" 6"	90° 90°	 TD449-382
9614096603 9614096643	**12405** **16530**	9614096613 9614096653	**12498** **16748**	9614096623 9614096663	**12405** **16530**	9614096633 9614096673	**12498** **16748**	4" 6"	180° 180°	 TD449-383
9614096604 9614096644	**12405** **16530**	9614096614 9614096654	**12498** **16748**	9614096624 9614096664	**12405** **16530**	9614096634 9614096674	**12498** **16748**	4" 6"	270° 270°	 TD449-384
										12-3 Ports
9614096605 9614096645	**12496** **16691**	9614096615 9614096655	**12591** **16907**	9614096625 9614096665	**12496** **16691**	9614096635 9614096675	**12591** **16907**	4" 6"	00° 00°	 TD449-385
9614096606 9614096646	**12496** **16691**	9614096616 9614096656	**12591** **16907**	9614096626 9614096666	**12496** **16691**	9614096636 9614096676	**12591** **16907**	4" 6"	90° 90°	 TD449-386
										21-3 Ports
9614096607 9614096647	**12302** **16450**	9614096617 9614096657	**12396** **16666**	9614096627 9614096667	**12302** **16450**	9614096637 9614096677	**12396** **16666**	4" 6"	00° 00°	 TD449-387
9614096608 9614096648	**12496** **16691**	9614096618 9614096658	**12591** **16907**	9614096628 9614096668	**12496** **16691**	9614096638 9614096678	**12591** **16907**	4" 6"	90° 90°	 TD449-388
										22-4 Ports
9614096609 9614096649	**12692** **16933**	9614096619 9614096659	**12786** **17150**	9614096629 9614096669	**12692** **16933**	9614096639 9614096679	**12786** **17150**	4" 6"	00° 00°	 TD449-389
9614096610 9614096650	**12692** **16933**	9614096620 9614096660	**12786** **17150**	9614096630 9614096670	**12692** **16933**	9614096640 9614096680	**12786** **17150**	4" 6"	90° 90°	 TD449-390