Simply Unique Single Seat

Unique 7000

Concept

The Unique 7000 is an innovative new generation of Tri-Clover® single seat valves that are designed to meet the highest process demands of hygiene and safety. They're built on a well-proven, platform from an installed base of more than one million valves.

The Unique 7000 is a sanitary air-operated seat valve with a flexible design. It can be configured as a shut-off valve with two or three ports or as a change-over valve with three to five ports. It's ideal applications include the dairy, beverage, brewery, food, pharmaceutical, biotechnology and personal care industries.

Working principle

The valve is a pneumatic seat valve in a hygienic and modular design for a wide field of duties, e.g. as a shut-off valve with two (2) or three (3) ports or as a change-over valve with three (3) to five (5) ports. The valve is remote-controlled by means of compressed air. It has few and simple moveable parts which results in a very reliable valve and low maintenance cost.

Standard design

The Unique 7000 valve is designed to deliver years of reliability and performance you've come to expect with all Tri-Clover® products. Its flexible design consists of either one or two bodies that are clamped together. The TR2 seat ring with enhanced CIP capabilities and hygiene comes standard with all Unique 7000 valves. For added confidence, the valve can be supplied with a controlled compression elastomer seal ring. The standard actuator comes with a five year warranty. The Unique 7000 valve sizes range from 1" to 4".

TECHNICAL DATA

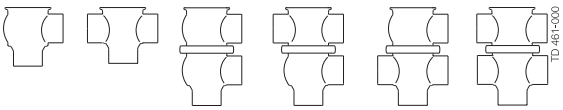
Temperature

Temperature range	14°F to +284°F (EPDM) Elastomer Seal Plug

Pressure

Max. product pressure	145 PSI (10 bar)
Min. product pressure	Full vacuum
Air pressure:	72.5 to 101.5 PSI (5 - 7 bar)

Valve Body Combinations



Actuator function

- Pneumatic downward movement, spring return.
- Pneumatic upward movement, spring return.
- Pneumatic upward and downward movement (A/A).
- Actuator for intermediate position of the valve plug (optional)

PHYSICAL DATA

Materials

Product wetted steel parts:	AISI 316L (internal Ra < 32 µ inch)
Other steel parts:	AISI 304
Plug seal:	PTFE (TR2) (standard) Max. 230°F
Optional elastomer plug seal:	EPDM, HNBR or FPM
External surface finish	Semi-bright (blasted)
Internal surface finish	Bright (polished), Ra < 32 µin
Product wetted seals:	EPDM
Optional product wetted seals:	HNBR or FPM
Other seals	NBR

Authorized to carry the 3A symbol

CERTIFIED EHEDG TYPE EL OCTOBER 2008

Options

A. Replaceable elastomer plug seals.
B. Control and Indication: IndiTop, ThinkTop or ThinkTop Basic.
C. Product wetted seals in HNBR or FPM.
D. Plug seals HNBR, FPM or TR2 plug (floating PTFE design).
E. External surface finish blasted.

Note!

For further details, see instruction ESE00213.

Other valves in the same basic design

- Reverse acting valve.
- Long stroke valve.
- Manually operated valve.
- Extended stroke available for 4"

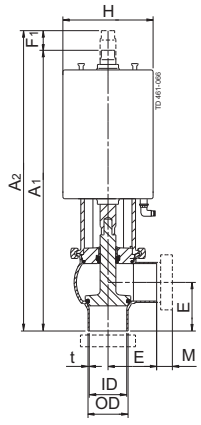
The actuator comes with a 5 years warranty

Dimensions (in)

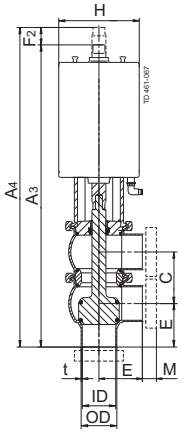
	Nominal Size						
	1"	1.5"	2"	2.5"	3"	4"	4" XL stroke
A1	12.3	12.34	14.27	15.31	16.62	18.40	N/A
A2	12.89	13.13	15.3	16.29	17.8	19.58	28.00
A3	14.19	14.7	17.18	18.70	20.51	23.27	N/A
A4	14.66	15.41	18.04	19.57	21.57	24.33	28.00
A1 High pressure	13.78	13.76	15.37	16.41	21.04	22.80	-
A2 High pressure	14.31	14.55	16.36	17.39	22.17	23.95	-
A3 High pressure	15.60	16.18	18.28	19.81	24.91	27.67	-
A4 High pressure	16.07	16.85	19.15	13.46	25.91	28.67	-
C	1.88	2.39	2.91	3.4	3.89	4.87	4.87
OD	0.98	1.5	2.01	2.5	3	4	4
ID	0.86	1.37	1.88	2.37	2.87	3.84	3.84
t	0.06	0.06	0.06	0.06	0.06	0.08	0.08
E1	1.97	1.95	2.40	3.19	3.39	4.69	4.69
E2	1.97	1.95	2.40	3.19	3.39	4.69	4.69
F1	0.59	0.79	0.98	0.98	1.18	1.18	2.93
F1 High pressure	-	-	-	-	1.12	1.15	-
F2	0.47	0.67	0.87	0.87	1.06	1.06	2.67
F2 High pressure	-	-	-	-	1.00	1.00	-
H	3.35	3.35	4.53	4.53	6.20	6.20	6.00
H High pressure	4.53	4.53	6.20	6.20	6.20	6.20	-
M/ Clamp	0.5	0.5	0.5	0.5	0.5	0.63	N/A
Weight (lb)							
Shut-off valve	6.8	7.3	12.1	14.3	24.9	30.0	93.7
Change-over valve	8.6	9.3	15.7	18.7	30.9	39.7	118.4
Stop Valve: High pressure	10.4	10.6	20.9	22.0	21.6	31.3	-
Change-over valve: High pressure	10.8	11.2	22.3	23.8	24.0	36.4	-

For exact high pressure actuator dimension (A and F) - please refer to information in CAS

* Internal stroke



Shut-off valve



Change-over valve

Please note!

Opening/closing time will be effected by the following:

- The air supply (air pressure).
- The length and dimensions of the air hoses.
- Number of valves connected to the same air hose.
- Use of single solenoid valve for serial connected air actuator functions.
- Product pressure.

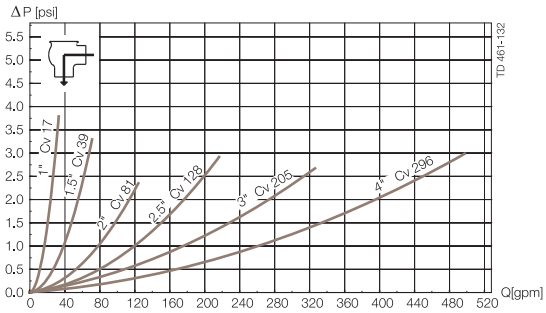
Air Connections Compressed air:

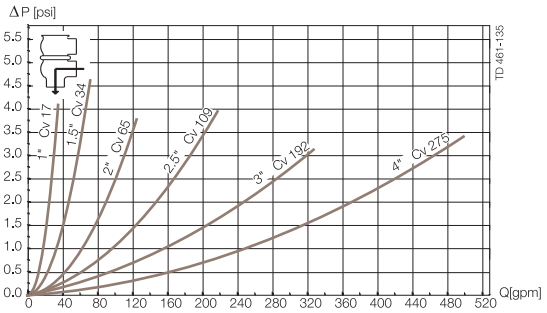
R 1/8" (BSP), internal thread.

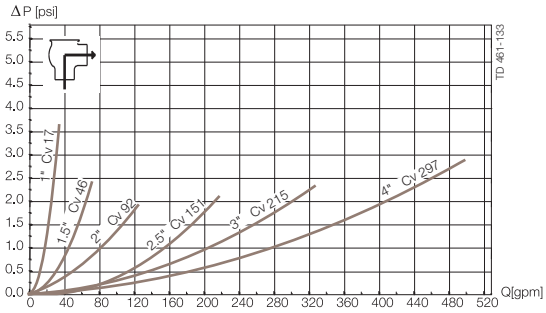
Replaceable elastomer plug seal

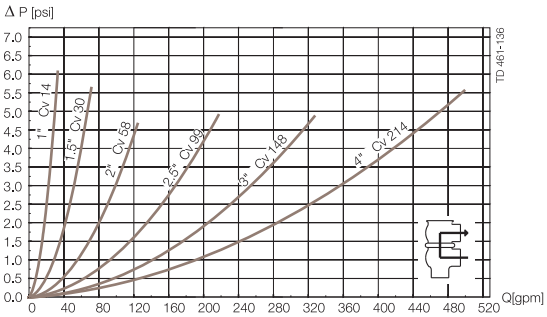
Air Consumption (In^3 free air) for one stroke			
Size	**1"-1½"**	**2"-2½"**	**3"-4"**
NO and NC	0.2 x air pressure [PSI]	0.5 x air pressure [PSI]	1.3 x air pressure [PSI]
A/A	0.5 x air pressure [PSI]	1.1 x air pressure [PSI]	2.7 x air pressure [PSI]

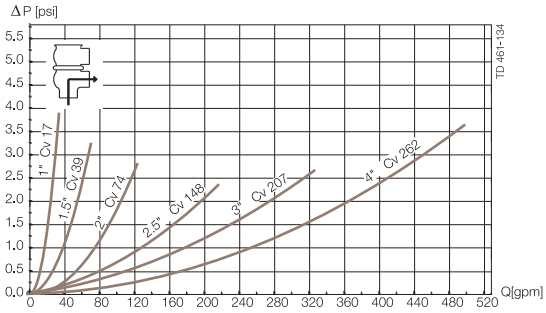
Pressure drop/capacity diagrams

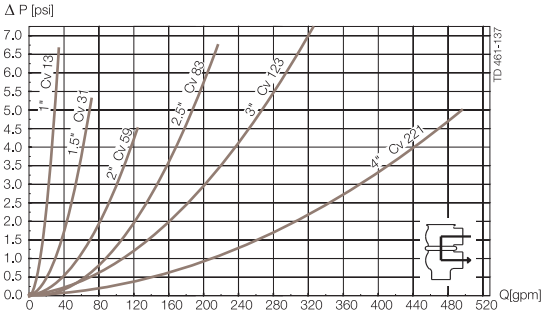












Note!

For the diagrams the following applies:
Medium: Water (68° F/20° C)

Measurement: In accordance with VDI2173

Pressure drop can also be calculated in CAS.

Pressure drop can also be calculated with the following formula:

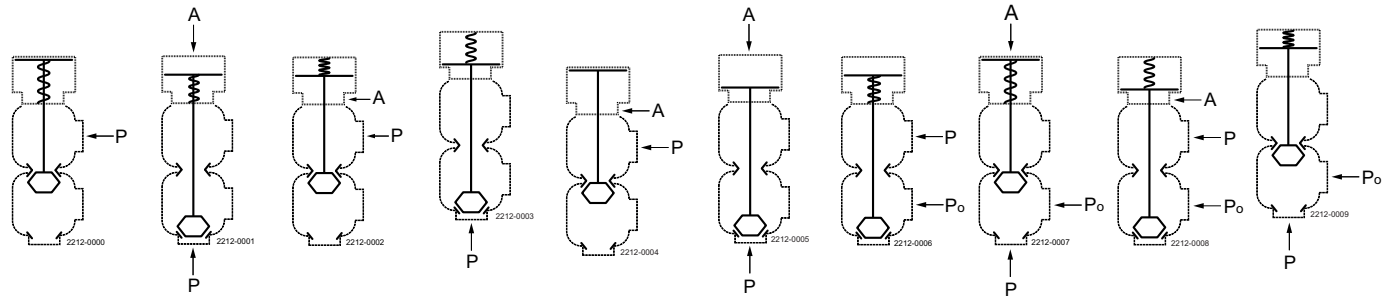
$Q = Cv \times \sqrt{\Delta p}$

Where
Q = Flow (gallon/minute).
Cv = gallon/minute at a pressure drop of 1 psi (see table above).
Δ p = Pressure drop in psi over the valve.
How to calculate the pressure drop for an ISO 2.5" shutt-off valve if the flow is 160 gallon/minute.
2.5" shut-off valve, where Cv = 128 (See table above).
$Q = Kv \times \sqrt{\Delta p}$
$160 = 128 \times \sqrt{\Delta p}$

$$\Delta p = \left(\frac{160}{128}\right)^2 = 1{,}6 \text{ psi}$$

(This is approx. the same pressure drop by reading the y-axis above)

Pressure data for Unique 7000 Series valves



A = Air P/Po = Product pressure

Table 1 - Shut-off and Change-over valves **Max. pressure in bar without leakage at the valve seat**

Actuator / Valve body combination and direction of pressure	Air pressure (psi)	Plug position	Valve size					
			1"	1½"	2"	2½"	3"	4"
1		NO	145.0	119.0	122.0	65.0	99.0	64.0
2	72.5	NO	133.0	64.0	86.0	49.0	64.0	42.0
	87.0		145.0	110.0	139.0	81.0	104.0	70.0
	101.5		145.0	145.0	145.0	113.0	145.0	97.0
3	72.5	NC	145.0	83.0	99.0	54.0	68.0	44.0
	87.0		145.0	142.0	145.0	88.0	112.0	73.0
	101.5		145.0	145.0	145.0	123.0	145.0	100.0
4		NC	145.0	91.0	104.0	61.0	93.0	61.0
5	72.5	A/A	145.0	145.0	145.0	145.0	145.0	136.0
	87.0		145.0	145.0	145.0	145.0	145.0	145.0
	101.5		145.0	145.0	145.0	145.0	145.0	145.0
6	72.5	A/A	145.0	145.0	145.0	145.0	145.0	132.0
	87.0		145.0	145.0	145.0	145.0	145.0	145.0
	101.5		145.0	145.0	145.0	145.0	145.0	145.0

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