Simply Unique

Unique 7000 Tangential body/Tank valve

Concept

The Unique 7000 Series 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. It can be configured 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.

Working principle

The valve is remote-controlled by means of compressed air. It has few and simple moveable parts which results in a very reliable valve with 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 series 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 tangential valve sizes range from 2" to 4".

TECHNICAL DATA

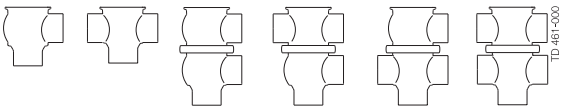
Temperature

Temperature range: . . . . . 50°F to +284°F (EPDM)

Pressure

Max. product pressure (depending on valve specifications): . . . . . 145 psi (10 bar).
Min. product pressure: . . . . . Full vacuum
Air pressure: . . . . . 72.5 to 101.5 psi (5-7 bar).

Valve Body Combinations



200 300 210 220 310 320

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)
Optional elastomer plug seal: . . . . . EPDM, HNBR or FPM
Other product wetted seals: . . . . . EPDM
Optional product wetted seals: . . . . . HNBR or FPM
Other seals: . . . . . NBR

Options

A. Weld ends or connection types other than Tri-Clamp.
B. Control and Indication: IndiTop, ThinkTop or ThinkTop Basic.
C. Aseptic version.
D. Product wetted seals in HNBR or FPM.
E. Replaceable elastomer plug seals.
F. High pressure actuator.
G. Manually operated.
H. NO or A/A actuator.
I. Long stroke actuator.
J. Maintainable actuator.
K. External surface finish blasted.

Note!

For further details, see instruction ESE00586.

Other valves in the same basic design

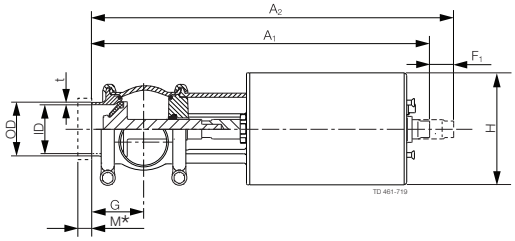
The valve range includes several purpose built valves. Below are some of the valve models available, though please use the Alfa Laval computer aided selection tool (CAS) for full access to all models and options.

- Reverse acting valve.
- Long stroke valve.
- Manually operated valve.
- Aseptic valve.

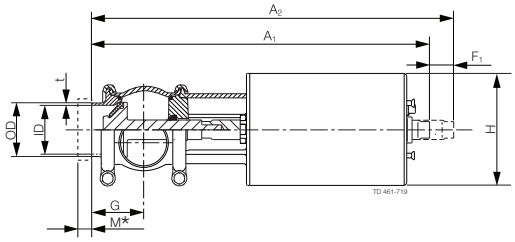
Dimensions

	Nominal Size			
	2"	**2.5"**	**3"**	**4"**
A_1	14.23	14.72	16.08	17.06
A_2	15.21	15.70	17.26	18.24
A_3	17.13	18.12	19.98	21.92
A_4	18.00	18.98	21.04	22.98
C	2.91	3.40	3.89	4.87
OD	2	2.5	3	4
ID	1.88	2.37	2.87	3.84
t	0.06	0.06	0.06	0.08
E	2.40	3.19	3.39	4.69
G	2.36	2.60	2.85	3.34
F_1	0.98	0.98	1.18	1.18
F_2	0.87	0.87	1.06	1.06
H	4.52	4.52	6.07	6.07
N	0.56	0.70	0.85	0.98
M/Tri Clamp	0.5	0.5	0.5	0.63
M/SMS male	0.8	0.9	0.9	1.4
Weight (lb)				
Shut-off valve	12.7	15	25.9	31.1
Change-over valve	16.3	19.8	32	41.4

Note: M*/Tri Clamp (Inlet) is designed for use with 13 MHP clamp.



Shut-off valve



Change-over valve

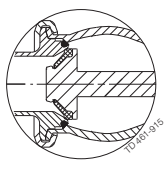
Please note!

Opening/closing time will be effected by the following:

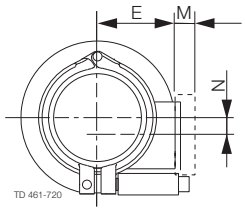
- The air supply (air pressure).
- The length and dimensions of the air hoses.
- Number of valves connected to the same air hose.
- Use of single solenoid valve for serial connected air actuator functions.
- Product pressure.

Air Connections Compressed air:

R 1/8" (BSP). Internal thread.

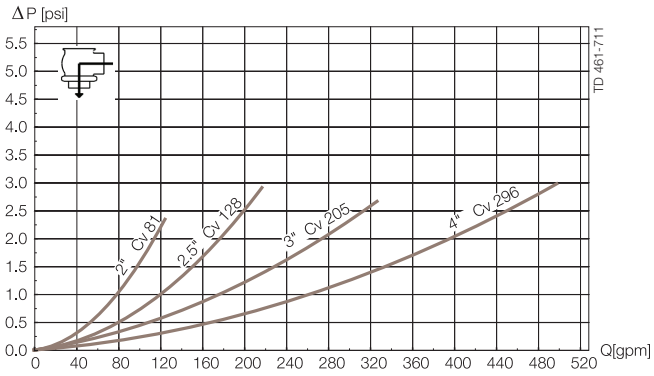


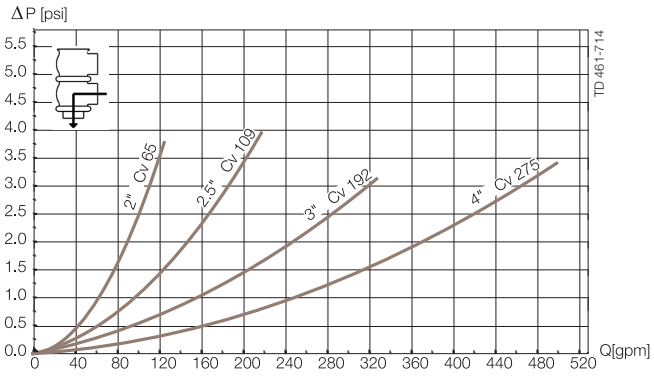
Replaceable elastomer plug seal

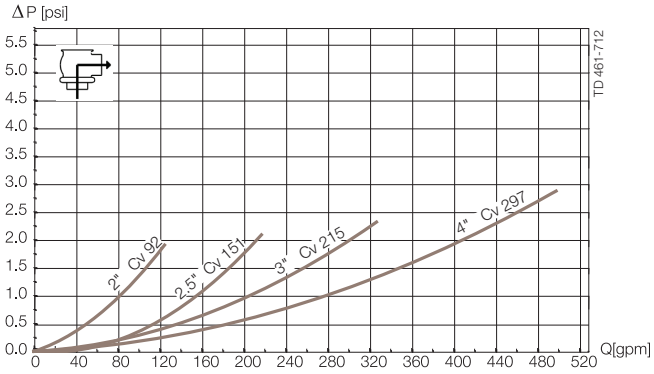


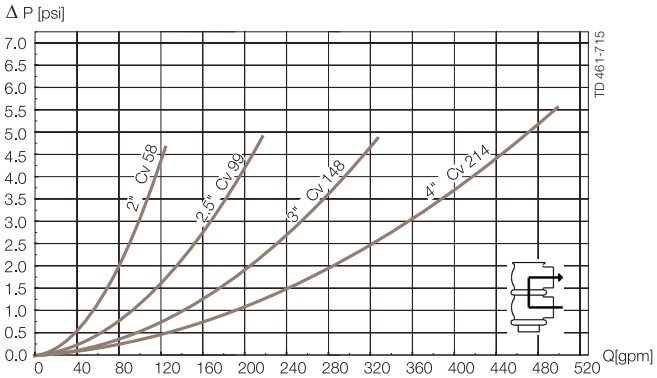
Air Consumption (ln^3 free air) for one stroke		
Size	**2"-2½"**	**3"-4"**
NO and NC	2.17 x air pressure [psi]	5.51 x air pressure [psi]
A/A	4.82 x air pressure [psi]	11.15 x air pressure [psi]

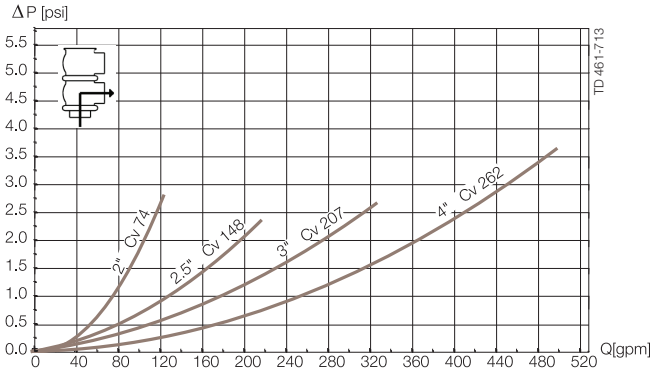
Pressure drop/capacity diagrams

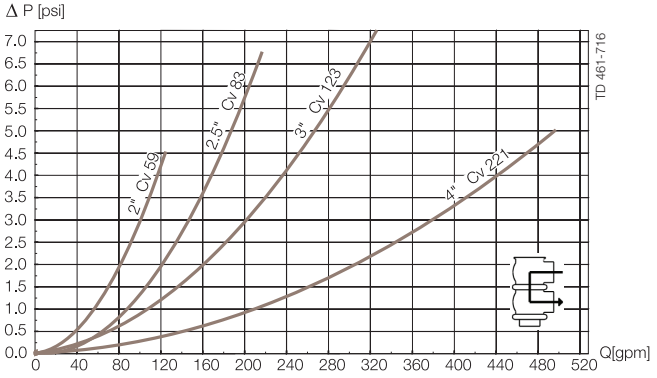












Note!

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.

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Cv = gallon/minute at a pressure drop of 1 psi (see table above).
Δ p = Pressure drop in psi over the valve.
2.5" shut-off valve, where Cv = 128 (See table above).

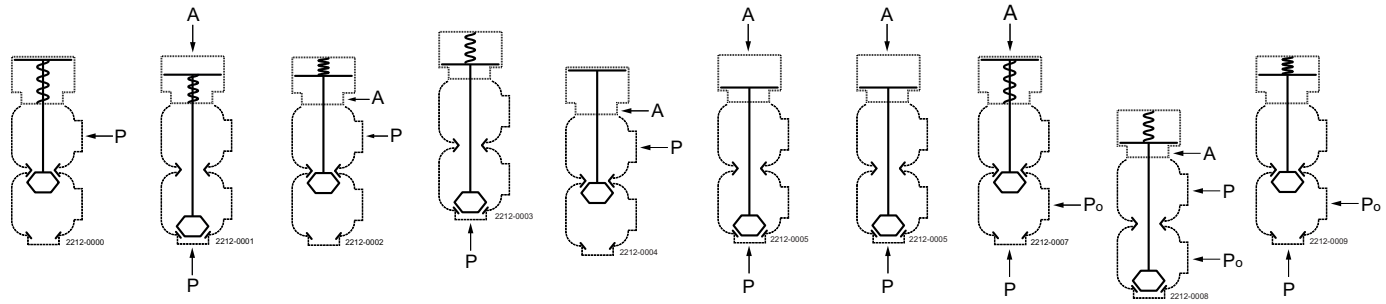
$Q = Kv \times \sqrt{\Delta p}$

$160 = 128 \times \sqrt{\Delta p}$

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

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

Pressure data for Unique 7000 Tangential body/Tank valve



A = Air P/Po= Product pressure

Table 1 - Shut-off and change-over valves

Max. pressure in PSI without leakage at the valve seat

Actuator / Valve body combination and direction of pressure	Air pressure (PSI)	Plug position	Valve size			
			2"	2½"	3"	4"
1		NO	122	65	99	64
2	87	NO	139	81	104	70
3	87	NC	145	88	112	73
4		NC	104	61	93	61
5	87	A/A	145	145	145	145
6	87	A/A	145	145	145	145

Table 2- Shut-off and change-over valves

Max. pressure in PSI against which the valve can open

Actuator / Valve body combination and direction of pressure	Air pressure (PSI)	Plug position	Valve size			
			2"	2½"	3"	4"
7		NO	145	107	141	91
8	87	NO	145	120	144	95
9	87	NC	145	131	145	100
10		NC	145	99	132	88

Table 3- Shut-off and change-over valves with high pressure actuator option

Max. pressure in PSI against which the valve can open

Actuator / Valve body combination and direction of pressure	Air pressure (PSI)	Plug position	2"	2½"	3"	4"
1		NO	145	145	-	-
2	87	NO	145	145	-	-
3	87	NC	145	145	73	44
4		NC	145	145	145	102

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