



Simply Unique

Unique 7000 Series - Two Step

General Information

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.

Application

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.

Unique 7000 Series - Two Step as shut off (only as NC) can be used for reducing pressure hammers and dosing e.g. in connection with filling of a vessel where an exact volume is required. The degree of opening for the intermediate position can be adjusted by removing spacer rings inside the actuator.

Unique 7000 Series - Two Step as Change over (NC and NO) can be used for drainage of two pipe simultaneously or split of flow in three lines.

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 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 series valves. For added confidence, the valve can be supplied with a controlled compression elastomer seat ring. The actuator is always maintainable.

The Unique 7000 Two Step valve sizes range from 1½" to 4".

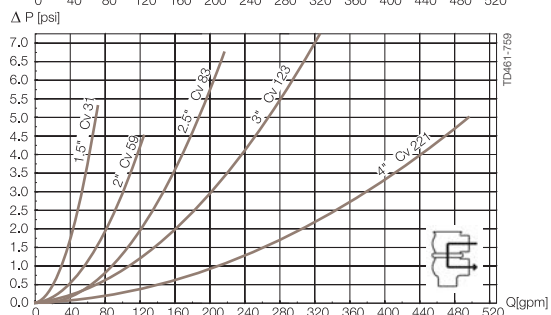
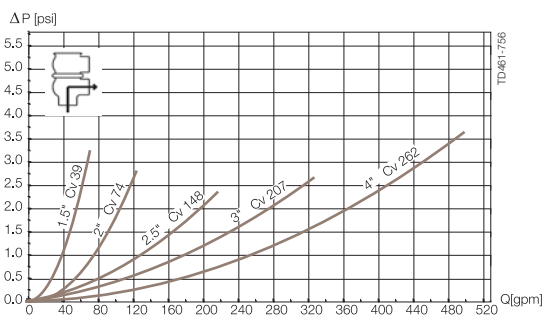
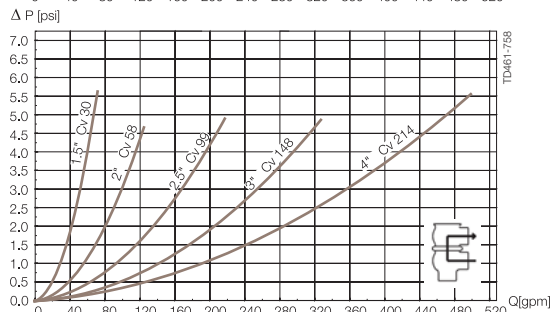
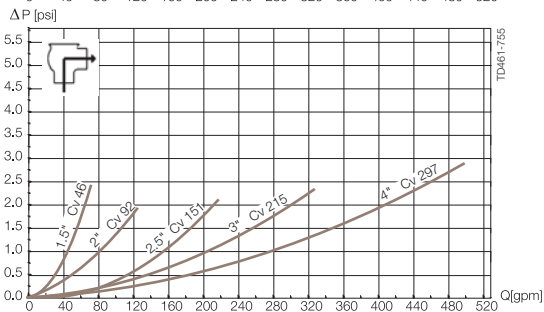
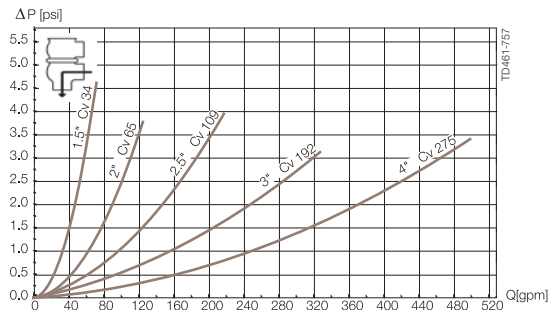
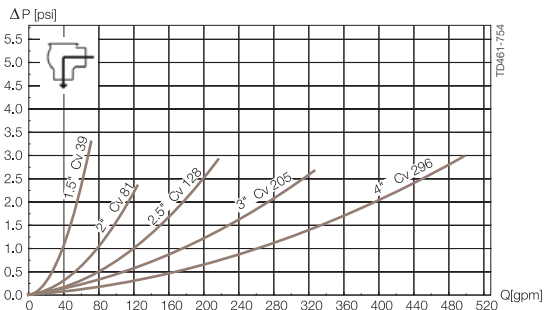
Other valves in the same basic design

- Aseptic valve



Unique 7000 Series- Two Step

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 be calculated in above table or in CAS.

Pressure drops can also be calculated with the following formula:

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

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" shut-off valve if the flow is 160 gallon/minute.

2.5" shut-off valve, where Cv = 128 (See table above).

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

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

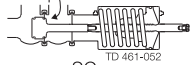
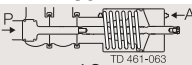
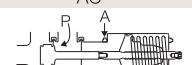

$$\Delta p = \left(\frac{160}{128}\right)^2 = 1,6 \text{ psi}$$

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

Pressure data for Unique 7000 - Two Step

Table 1 - Shut-off and Change-over valves

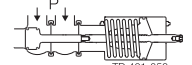

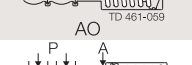
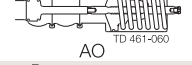
Max. pressure in psi without leakage at the valve seat

Actuator / Valve body combination and direction of pressure	Air pressure (psi)	Plug position	Valve size				
			1.5"	2"	2.5"	3"	4"
 SC TD 461-052		NO	145	122	62	100	64
 AC TD 461-053	87	NO	145	140	82	100	70
 AC TD 461-054	87	NC	145	145	90	110	72
 SC TD 461-055		NC	145	100	60	92	60

A = Air
P = Product pressure
AC = Air closes
SC = Spring closes

Table 2 - Shut-off and Change-over valves

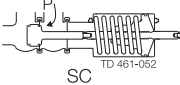
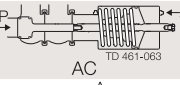
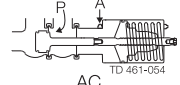
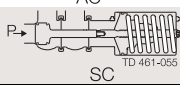
Max. pressure in psi against which the valve can open.

Actuator / Valve body combination and direction of pressure	Air pressure (psi)	Plug position	Valve size				
			1.5"	2"	2.5"	3"	4"
 SO TD 461-058		NO	145	145	107	140	90
 AO TD 461-059	87	NO	145	145	120	145	95
 AO TD 461-060	87	NC	145	145	130	145	100
 SO TD 461-061		NC	140	145	100	130	90

A = Air
P = Product pressure
AO = Air opens
SO = Spring opens

Table 3 - Shut-off and Change-over valves with high pressure actuator (option)

Max. pressure in psi without leakage at the valve seat

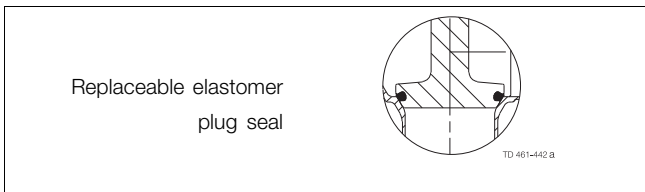
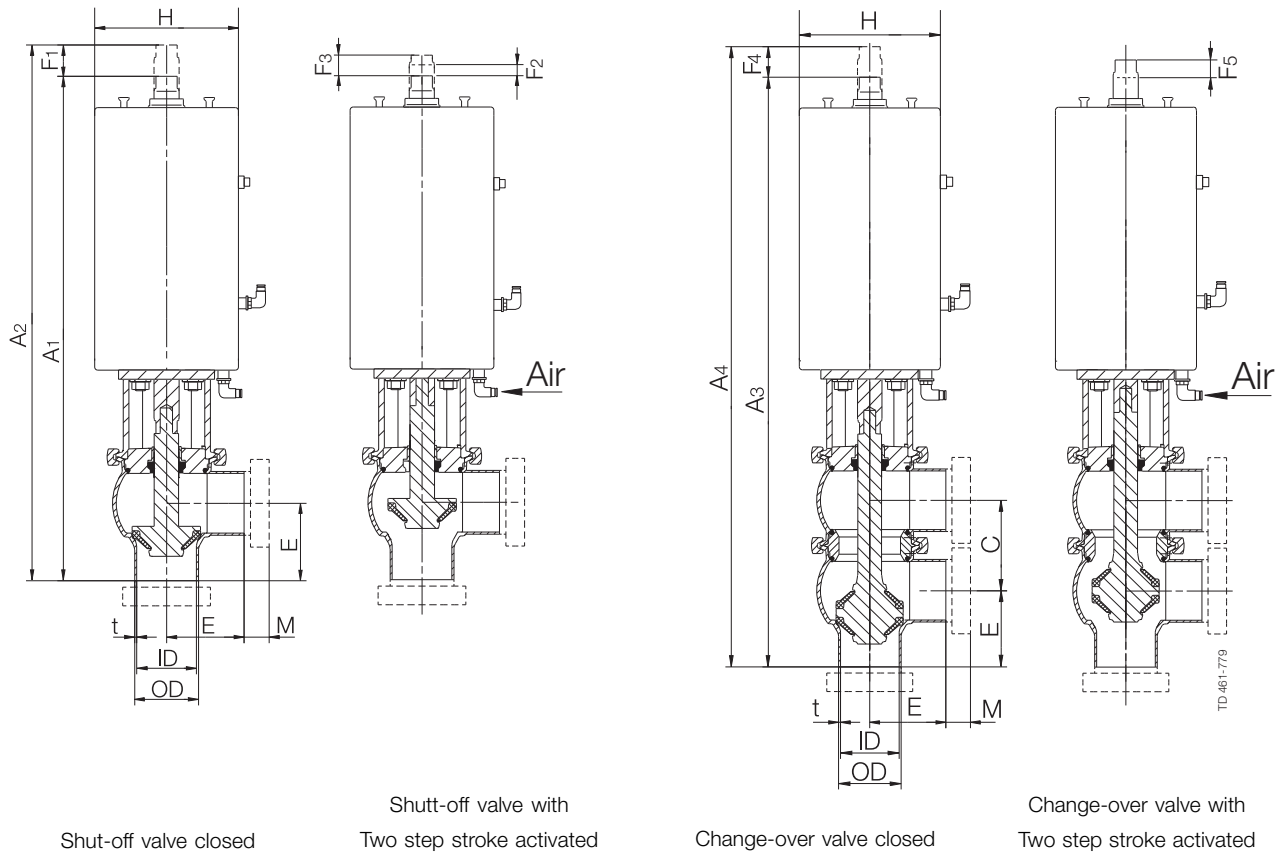
Actuator / Valve body combination and direction of pressure	Air pressure (psi)	Plug position	Valve size	
			2"	2.5"
 <p>SC TD 461-062</p>		NO	145	145
 <p>AC TD 461-063</p>	87	NO	145	145
 <p>AC TD 461-054</p>	87	NC	145	145
 <p>SC TD 461-055</p>		NC	145	140

- A = Air
- P = Product pressure
- AC = Air closes
- SC = Spring closes

Dimensions

Nominal size	Inch tubes DN/OD					High pressure	
	1,5"	2"	2,5"	3"	4"	2"	2,5"
A ₁	15.06	15.61	16.64	18.08	19.87	16.80	17.83
A ₂	15.84	16.60	17.62	19.30	21.05	17.78	18.82
A ₃	17.40	18.51	20.04	21.97	24.73	19.70	21.23
A ₄	18.12	19.38	20.90	23.04	25.80	20.57	22.10
C	2.39	2.91	3.40	3.89	4.87	2.91	3.40
OD	1.50	2.01	2.50	3.00	4.00	2.01	2.50
ID	1.37	1.88	2.37	2.87	3.84	1.88	2.37
t	0.06	0.06	0.06	0.06	0.08	0.06	0.06
E	1.95	2.44	3.23	3.43	4.72	2.44	3.23
F ₁	0.79	0.98	0.98	1.18	1.18	0.98	0.98
F ₂ Min. Two step stroke	0.12	0.12	0.12	0.10	0.10	0.24	0.24
F ₃ Max. Two step stroke	0.24	0.43	0.43	0.55	0.55	0.35	0.35
F ₄	0.67	0.87	0.87	1.06	1.06	0.87	0.87
F ₅ Two step stroke	0.26	0.43	0.43	0.55	0.55	0.35	0.35
H	4.53	4.53	4.53	6.06	6.06	6.06	6.06
M (clamp)	0.50	0.50	0.50	0.50	0.63	0.50	0.50
Weight (lb)							
Stop valve	15.43	16.09	18.30	31.75	36.82	18.96	21.16
Change-over valve	17.64	19.62	22.71	37.48	46.30	22.49	25.57

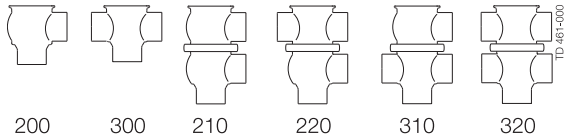
Air Connections: R 1/8" (BSP), internal thread.



Technical Data

Max. product pressure (depending on valve specifications) 145 psi (1000 kPa(10 bar)).
 Min. product pressure Full vacuum.
 Temperature range 14°F to +284°F (EPDM).
 Air pressure 72.5 to 101.5 psi (500 to 700 kPa (5 to 7 bar))

Valve Body Combinations



Actuator function

- Pneumatic downward movement, spring return.
- Pneumatic upward movement, spring return.

Air consumption (In ³ free air) for one stroke			
Size	1.5"	2 - 2.5"	3" - 4"
NO and NC	2.17 x air pressure [psi]	2.17 x air pressure [psi]	5.51 x air pressure [psi]

Caution, opening/closing time:

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.

Materials

Product wetted steel parts: AISI 316L (internal Ra < 32 µinch)
 Other steel parts AISI 304
 Plug seal: PTFE (TR2) (standard)
 Optional plug seal: EPDM, HNBR or FPM
 Other product wetted seals: EPDM (standard)
 Optional product wetted seals: HNBR and FPM
 Other seals NBR

Options

- A. Weld ends or connection types other than Tri-Clamp
- B. Control and Indication: IndiTop, ThinkTop, ThinkTop Basic and Greentop
- C. Product wetted seals in HNBR or FPM
- D. Replaceable elastomer plug seals
- E. High pressure actuator (only 2" - 2.5")
- F. External surface finish blasted

Ordering

Please state the following when ordering:

- Size
- Connections
- Valve body combination
- Actuator function: NC or NO
- Options

Note!

For further details, see instruction ESE00505.