

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

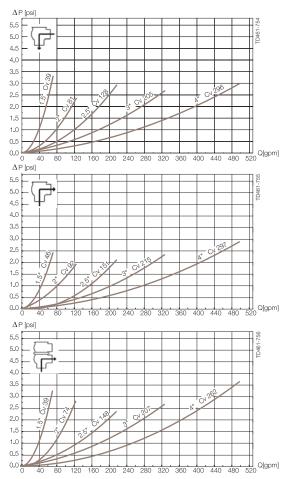
- Aseptic valve

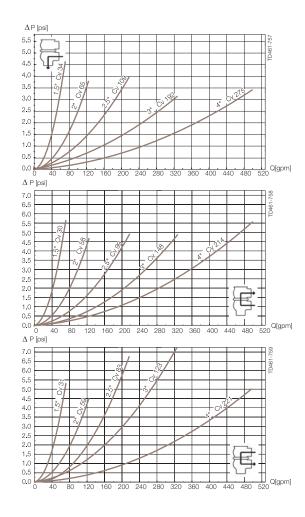


Unique 7000 Series- Two Step



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:

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

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).

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

160 = 128 x $√\Delta p$

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

(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	Air		Valve size				
combination and direction of pressure	pressure (psi)	Plug position	1.5"	2"	2.5"	3"	4"
SC TD 461-052		NO	145	122	62	100	64
AC TD 461-063	87	NO	145	140	82	100	70
AC TD 461-054	87	NC	145	145	90	110	72
P- TD-461-056		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	Air		Valve size				
combination and direction of pressure	pressure (psi)	Plug position	1.5"	2"	2.5"	3"	4"
P W W W W W W W W W		NO	145	145	107	140	90
AO TO 461-059	87	NO	145	145	120	145	95
AO TO 461-000	87	NC	145	145	130	145	100
SO TD 481-061		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	Air	Dive	Valve size		
combination and direction	pressure	Plug			
of pressure	(psi)	position	2"	2.5"	
SC TD 461-052		NO	145	145	
AC TD 461-063	87	NO	145	145	
AC TD 461-054	87	NC	145	145	
P+ TD 461-055		NC	145	140	

A = Air

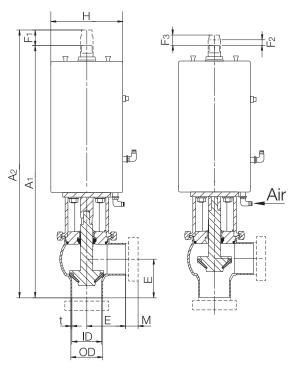
P = Product pressure

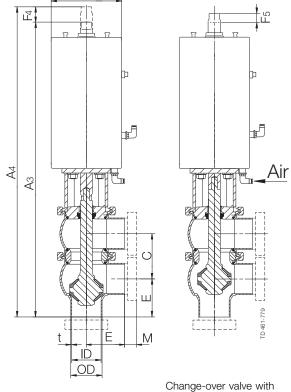
AC = Air closes SC = Spring closes

Dimensions

	Inch tubes					High pressure		
Nominal size	DN/OD						riigir 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	
С	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	
Е	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	
Н	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.





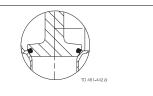
Shut-off valve closed

Shutt-off valve with
Two step stroke activated

Change-over valve closed

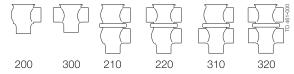
Two step stroke activated

Replaceable elastomer plug seal



Technical Data

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)</td>Other steel parts.AISI 304Plug seal:.PTFE (TR2) (standard)Optional plug seal:.EPDM, HNBR or FPMOther product wetted seals:.EPDM (standard)Optional product wetted seals:.HNBR and FPMOther 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.