



# Simply Unique

## Unique 7000 Series - Regulating Valve

### 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

This air-operated regulating valve is ideal for high volume, sanitary liquid processing applications where precision control of flow rate or pressure is required. It's designed to be used in a wide range of metering, blending, weighing and filling system applications. Configured as a shut-off valve with two or three ports, idea applications include the dairy, beverage, brewery, food, pharmaceutical, biotechnology and personal care industries.

### 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.

### Standard design

Designed to deliver years of reliable performance, it features a broad selection of stainless steel, tapered valve stems along with the Unique 7000 actuator to ensure an outstanding degree of precise product control. Rugged and long-lasting plastic stem bushings eliminate metal-to-metal galling. The stems are threaded to the actuator shaft, eliminating the coupling between the stem and the actuator, thereby ensuring proper alignment. The plug seal is a standard seal used by the entire Unique 7000 Series. Bushings at end of the actuator cylinder support stem and ensure perfect alignment. 32Ra finish is standard on the ID.

### Other valves in the same basic design

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

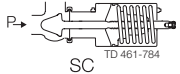
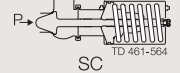


Unique 7000 - Regulating Valve

## Pressure data for Unique 7710 Series valves

Table 1 - Shut-off 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				
			1½"	2"	2½"	3"	4"
	87.6	NO	110.2	139.2	81.2	104.4	69.6
		NC	91.3	104.4	60.9	92.8	60.9

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

## Valve Sizing

### Flow Coefficients (Cv)

The following formula and flow coefficient values enable you to select the correct regulating valve for your application.

Formula for water and other products with a specific gravity equal to 1.0:

$$Cv = \frac{Q}{\sqrt{\Delta P}}$$

Formula for products with a specific gravity other than to 1.0:

$$Kv = \frac{Q}{\sqrt{\Delta P / SG}}$$

Where:

- Q = Product flow rate in gallons per minute
- SG = Specific gravity of product
- ΔP = Pressure drop across valve in psi (inlet pressure minus outlet pressure)

### Example of Cv Calculation:

Determine the proper size valve for 175 GPM of water.

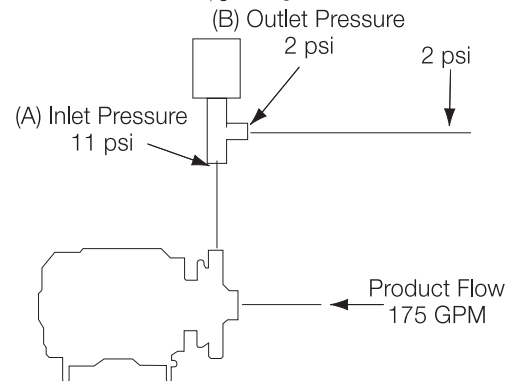
Inlet pressure of 11 psi

Outlet pressure of 2 psi

**Solution:** Inlet pressure (A) minus outlet pressure (B):

DP = 11 psi - 2 psi = 9 psi

$$Cv = \frac{175}{\sqrt{9}} = \frac{175}{3} = 58.3$$

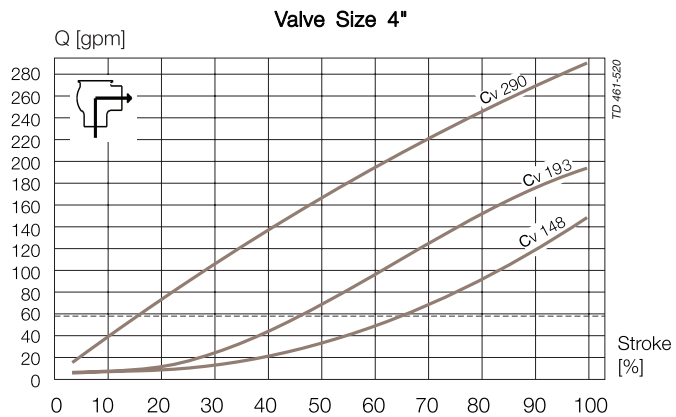
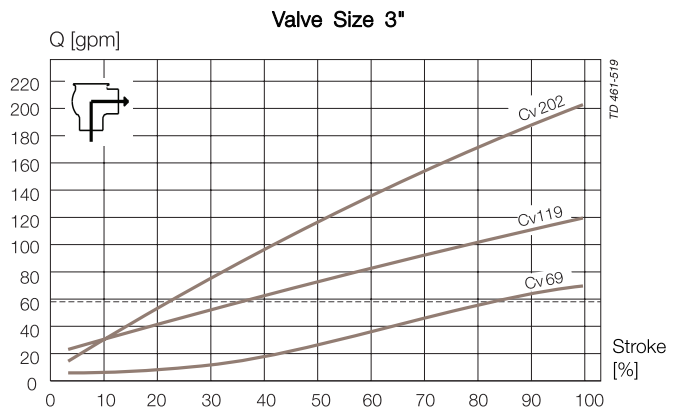
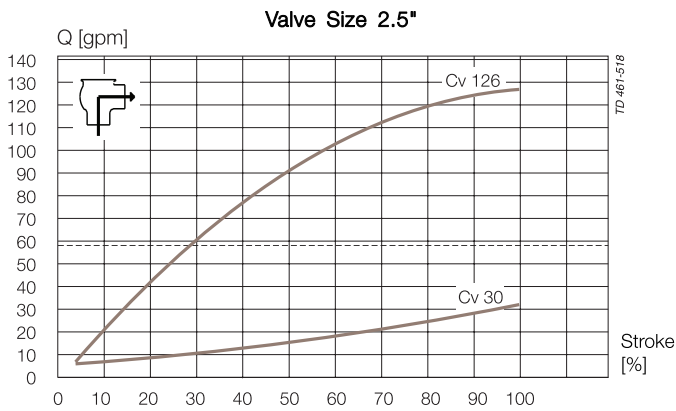
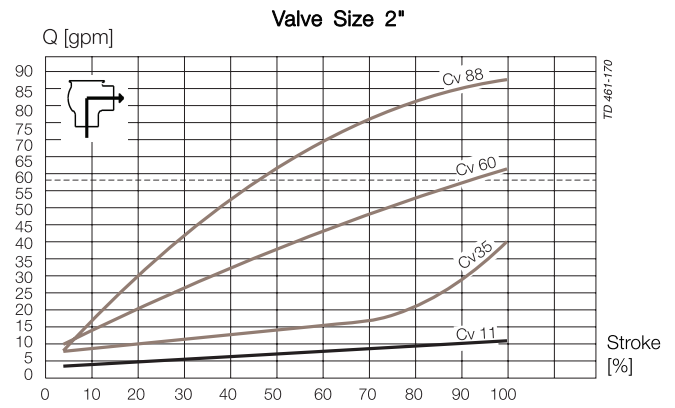
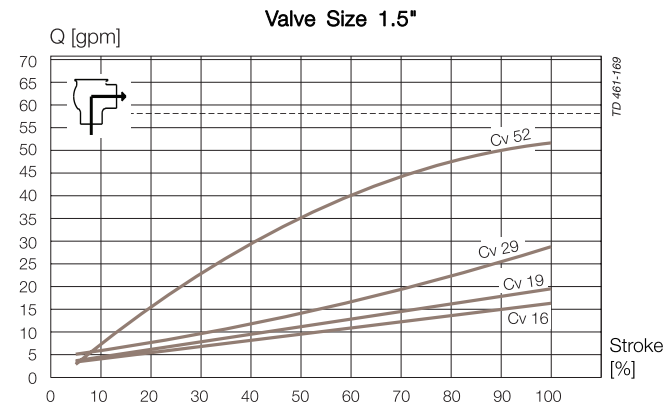


## How to Use Data to Select Valve Size

After the Cv factor for a specific application has been calculated, locate the factor on the following page. Choose the curve closest to the 50% stroke.

Using the above example, refer to the chart on page 3 you will find that the Cv factor (58.3) is marked on the chart. You will find that a 2" valve crosses 1 Cv curve, 2½" 1 curve, 3" 3 curves and 4" 3 curves. The correct valve size to use is 2" because Cv 58.3 crosses the curve closest to the optimum operating point 50%. Alternatively the 4" valve is also close to the 50%.

## Pressure drop/capacity diagrams



**Note!**

For the diagrams the following applies:

Medium: Water (68° F/20° C)

Measurement: In accordance with VDI2173

**Note!**

----- (dotted line) = Cv 58.3

**Dimensions**

	1.5"	2"	2.5"	3"	4"
A	21.40	23.37	24.40	25.71	27.50
OD	1.5	2.01	2.5	3.0	4
ID	1.37	1.88	2.37	2.87	3.84
t	0.06	0.06	0.06	0.06	0.08
E	1.95	2.44	3.23	3.43	4.72
H	3.35	4.52	4.52	6.07	6.07
M/ Clamp	0.50	0.50	0.50	0.50	0.63
<b>Weight (lb)</b>					
Shut-off valve	16.1	21.0	23.1	36.0	41.1



Shut-off valve

TD 461-540

**Air Connections Compressed air:**

R 1/8" (BSP) internal thread for actuator. 1/4" (NPT) for positioner

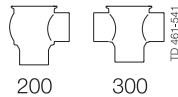
## Technical data

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 - 7 bar)).  
Positioner data: . . . . .See manual for positioner

## Actuator function

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

## Valve Body Combinations



## Materials

Product wetted steel parts: . . . . .AISI 316L (internal Ra < 32 μ inch)  
Other steel parts: . . . . .AISI 304  
Plug seal: . . . . .EPDM (standard)  
Optional plug seal: . . . . .HNBR or FPM  
Other product wetted seals: . . . . .EPDM (standard)  
Optional product wetted seals: . . . . .HNBR or FPM  
Other seals: . . . . .NBR

## Options

- Weld ends or connection types other than Tri-Clamp.
- Product wetted seals in HNBR or FPM.
- Maintainable actuator.
- External surface finish blasted.

## Ordering

Please state the following when ordering:

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

## Note!

For further details, see instruction ESE00480ENUS.

# Description Code Unique 7000

Examples:

7610-012M1H40-1SSS-TY-S041 (All Ports Tri-Clamp)

7610-012SNNNNWMM1H40-1SSS-TY-S041  
(Combination Ports Weld & Tri-Clamp)

Valve function	Body						Actuation				Stem/elastomer		Misc.						
1	2	3	4	5	6	7	8	9	10	11	12	13	14						
7610	012	S	M			1	H40	1	S	S	S	T	Y	S					
			S	N	N	N	W	M	M	1	H40	1	S	S	S	T	Y	S	04

- 1 **Model**

Code	Code
-- Unique 7000	7610
-- Unique 7000 Aseptic	8610
-- Unique 7000 Tangential Outlet (Horizontal Mounting)	7620
-- Unique 7000 Tank Outlet (Vertical Mounting)	7630
-- Unique 7000 Regulating	7710
- 2 **Body style**

Code	Code
-- Shut-off (2 port)	200
-- Shut-off (3 port)	300
-- Shut-off Tangential Right (2 port)	208
-- Shut-off Tangential Left (2 port)	207
-- Shut-off Tangential Cross (3 port)	309
-- Change Over (3 port)	210
-- Change Over (4 port)	220
-- Change Over (4 port)	310
-- Change Over (5 port)	320
-- Shut-off RA (Reverse Acting) (2 port)	011
-- Shut-off RA (3 port)	021
-- Shut-off RA (3 port)	012
-- Shut-off RA (4 port)	022
-- Change Over RA (3 port)	111
-- Change Over RA (4 port)	211
-- Change Over RA (4 port)	121
-- Change Over RA (4 port)	112
-- Change Over RA (5 port)	212
-- Change Over RA (6 port)	222
-- Y-body	900
- 3 **Build in dimension**

Code	Code
-- Standard	S
-- 700 Series Build Dimensions (Center-Face; shut-off only)	C
- 4 **Connection Ports - all identical**

Code	Code
-- Weld ends - all ports	W
-- Tri-Clamp - all ports	M
-- Threaded Bevel Seat - all ports	T

**Connection Ports - mixed**

Code	Code
Mixed connection types	S
-- Weld end	W
-- Tri-Clamp	M
-- Iso Clamp	I
-- Union SMS	S
-- Union DIN	C
-- Din Clamp	D
-- Threaded Bevel Seat	T
-- No port	N
- 5 **Surface Finish**

Code	Code
-- 3A (OD = Dust blast; ID = 32Ra)	1
-- 3A Bright (OD = Bright; ID = 32Ra)	2
-- PG (3A) (OD = Dust blast; ID = 20Ra)	3
-- PL (3A) (OD = Bright; ID = 20Ra)	4
-- PP (3A) (OD = Bright; ID = 15Ra)	5
-- PM (3A) (OD = Bright; ID = 15Ra w/EP)	6
- 6 **Size (Port)**

Code	Code
-- 1-1/2-inch	H10
-- 1-1/2-inch	H15
-- 2-inch	H20
-- 2-1/2-inch	H25
-- 3-inch	H30
-- 4-inch	H40
- 7 **Actuation Mode**

Code	Code
-- Norm. Open/Spring to open	1
-- Norm. Open/Spring to open (RA)	2
-- Norm. Closed/Spring to close	2
-- Norm. Closed/Spring to close (RA)	1
-- Air to air	3
-- Two-step/Three Position	4
-- Manual	5
- 8 **Actuator Stroke**

Code	Code
-- Standard	S
-- Long Stroke	L
- 9 **Actuator Type**

Code	Code
-- Maintainable	R
-- Semi maintainable	S
- 10 **Holding Pressure Capability**

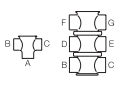
Code	Code
-- Standard	S
-- High pressure	H
- 11 **Stem Type**

Code	Code
-- Elastomer Plug Seal	S
-- TR2/PTFE Plug Seal	T
- 12 **Wetted Seal Materials**

Code	Code
-- EPDM	E
-- HNBR	U
-- FPM (Fluoroelastomer)	Y
- 13 **Assembled Valve**

Code	Code
Assembled valve	S
- 14 **Top Unit Type**

Code	Code
ThinkTop digital 0 solenoid	TA
ThinkTop digital 1 solenoid	TB
ThinkTop digital 2 solenoid	TC
ThinkTop digital 3 solenoid	TD
ThinkTop 110 V digital 0 solenoid	TE
ThinkTop ASI 0 solenoid	TF
ThinkTop ASI 1 solenoid	TG
ThinkTop ASI 2 solenoid	TH
ThinkTop ASI 3 solenoid	TI
ThinkTop Device Net 0 solenoid	TJ
ThinkTop Device Net 1 solenoid	TK
ThinkTop Device Net 2 solenoid	TL
ThinkTop Device Net 3 solenoid	TM



TD 461-451


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The information contained herein is correct at the time of issue,  
but may be subject to change without prior notice.

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