Simply Unique

Unique 7710 Regulating Valve with moore positioner

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.

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.

TECHNICAL DATA

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

Authorized to carry the 3A symbol

PHYSICAL DATA

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

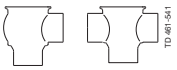
Options

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

Actuator function

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

Valve Body Combinations



200 300

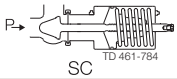
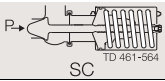
Other valves in the same basic design

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

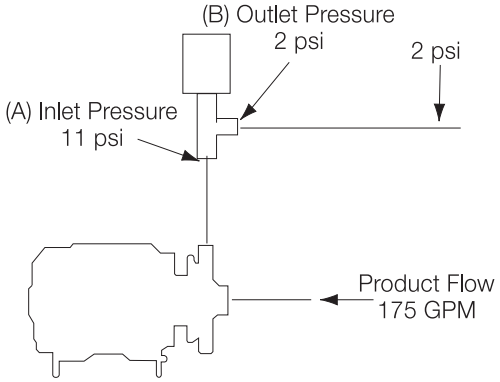
Determine the proper size valve for 175 GPM of water.

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

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



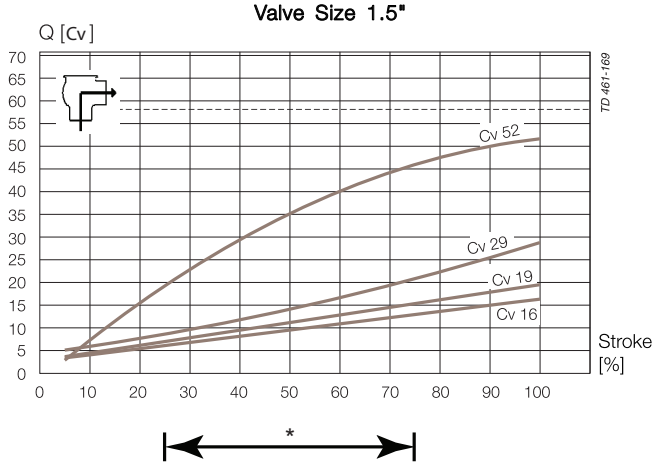
How to Use Data to Select Valve Size

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.

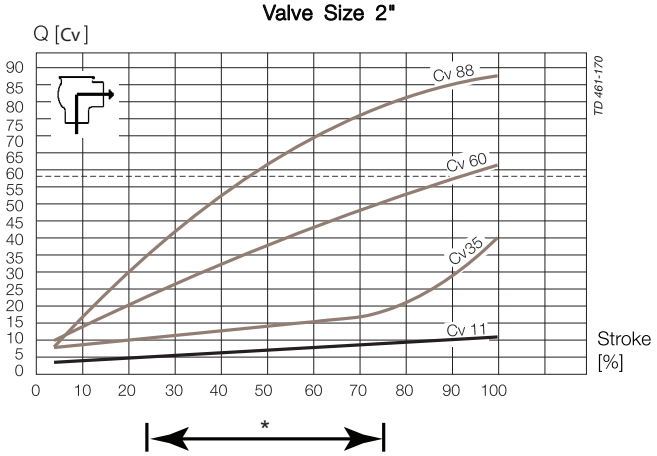
Using the above example, refer to the chart on page 3 you will find that the Cv factor (58.3) is marked on the chart. You will find that a 2" valve crosses 1 Cv curve, 2½" 1 curve, 3" 3 curves and 4" 3 curves. The correct valve size to use is 2" because Cv 58.3 crosses the curve closest to the optimum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

Pressure drop/capacity diagrams

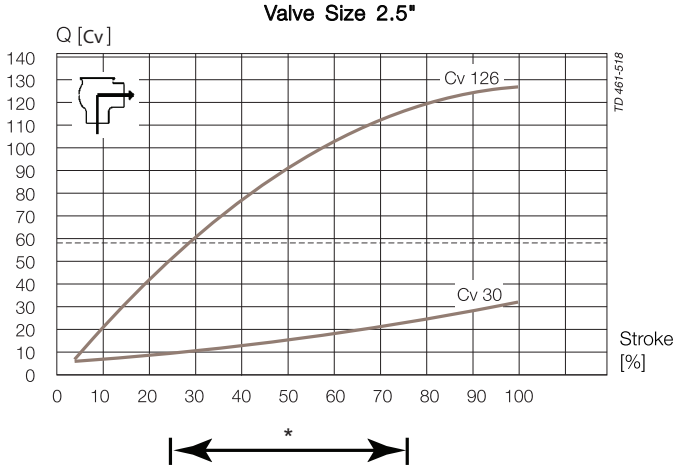
Valve Size 1.5"



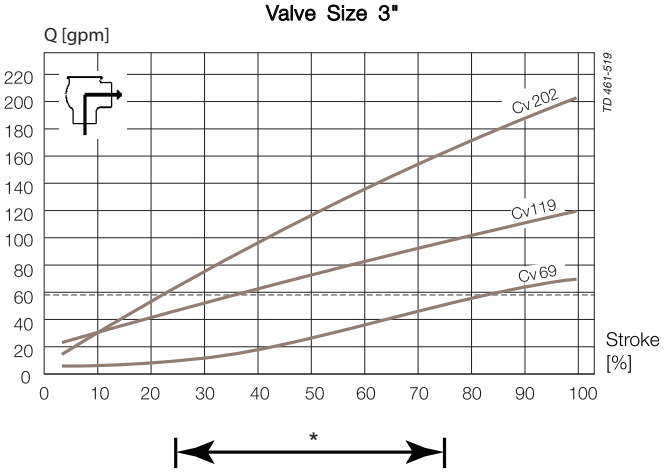
Valve Size 2"



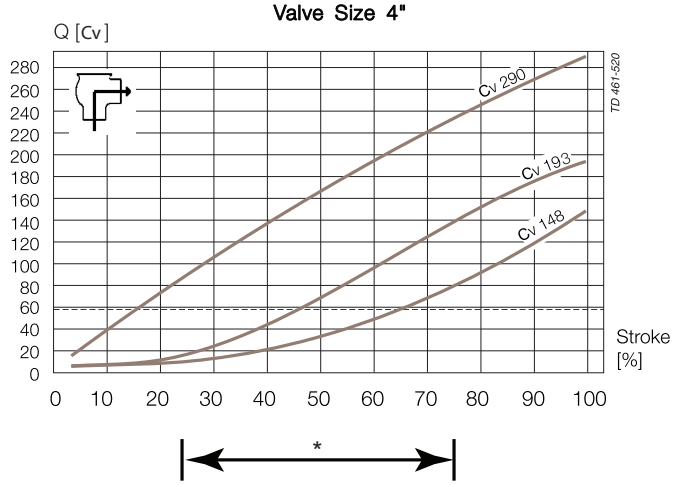
Valve Size 2.5"



Valve Size 3"



Valve Size 4"



Note!
For the diagrams the following applies:

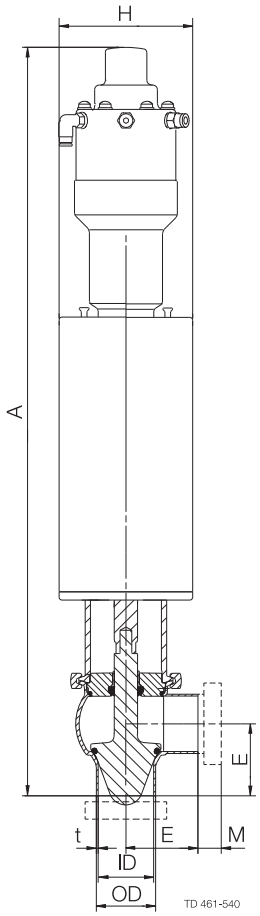
Medium: Water (68° F/20° C)
Measurement: In accordance with VDI2173

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

Alfa Laval recommend max. flow velocity in tubing and valves to be 5 m/sec.

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
Weight (lb)					
Shut-off valve	16.1	21.0	23.1	36.0	41.1



Shut-off valve

Air Connections Compressed air:

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

Note!

For further details, see instruction ESE00480ENUS.

ESE00517ENUS 1505

How to contact Alfa Laval
Contact details for all countries are continually updated on our website. Please visit www.alfalaval.us to access the information direct.