Control your flow

Unique RV-ST Regulating Valve

Concept

Unique RV-ST is the second generation of Alfa Laval single seat regulating valves designed to meet the highest process demands of hygiene and safety. Built on a well-proven, platform from an installed base of more than one million valves, it is ideal for high volume, sanitary liquid processing applications where precision control of flow rate or pressure is required.

Working principle

The valve is remote-controlled by a digital electro-pneumatic process controller. 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 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 for the entire Unique Series. Bushings at the end of the actuator cylinder support the stem and ensure perfect alignment.

TECHNICAL DATA

Max. product pressure: . . . . . 10 bar (1000 kPa).
Min. product pressure: . . . . . Full vacuum.
Temperature range: . . . . . 10°C to +140°C (EPDM).
Air pressure: . . . . . 5 - 7 bar (500 to 700 kPa).

Positioner data

Material: . . . . . PPS, stainless steel
Cover: . . . . . PC
Seals: . . . . . EPDM
Supply voltage: . . . . . 24 VDC +/- 10%
Working temperature: . . . . . 0 to 55 °C
Push-in fittings: . . . . . ø6mm or 1/4”
Protection class: . . . . . IP65 and IP67
Position detection module: . . . Contact-free, wear-free
Communication: . . . . . Analog

8692 Positioner – Top control with display

Setpoint setting: . . . . . 0/4 to 20mA and 0 to 5 5/10V
Output resistance: . . . . . 0/4 to 20 mA: 180Ω
0 to 5/10V: 19Ω
Power consumption: . . . . . < 5W
Cable gland: 2xM16x1,5 (cable-ø10mm)
Max. wire diameter . . . . . 1.5 mm^2

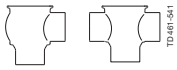
8694 Positioner – Basic control without display

Setpoint setting: . . . . . 0/4 to 20mA
Output resistance: 180Ω
Power consumption: . . . . . < 3,5W
Cable gland: 2xM16x1,5 (cable-ø10mm)
Max. wire diameter . . . . . 1.5 mm^2

PHYSICAL DATA

Product wetted steel parts: . . . 1.4404 (316L)
External finish . . . . . Semi-bright (blasted)
Internal finish . . . . . Bright (polished), internal Ra < 0.8 µm
Other steel parts: 1.4301 (304)
Plug seal: . . . . . EPDM
Other product wetted seals: . . EPDM (standard)
Other seals: . . . . . NBR

Valve Body Combinations



200 300

Other valves in the same basic design

- Sanitary Unique Single Seat
- Standard valve
- Reverse acting valve
- Long stroke valve
- Manually operated valve
- Aseptic valve

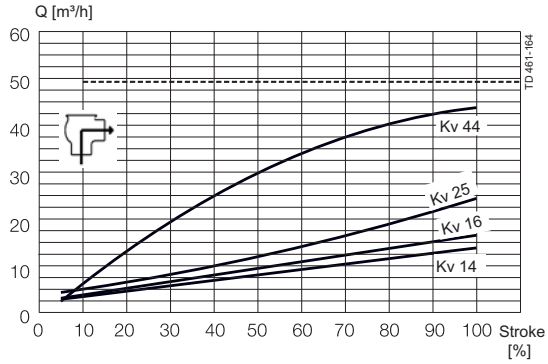
Options

a. Male parts or clamp liners in accordance with required standard
b. Product wetted seals in HNBR or FPM
c. Maintainable actuator
d. External surface finish blasted
e. Optional plug seal: HNBR or FPM

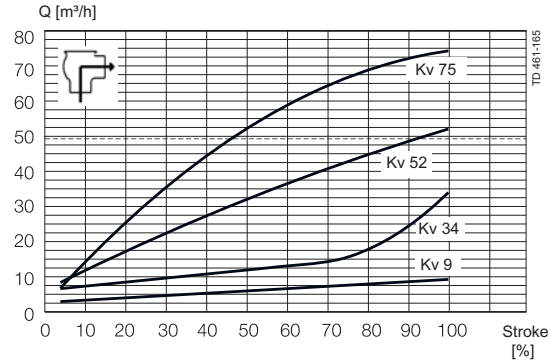
Note!
For further details, see instruction ESE02127

Pressure drop/capacity diagrams

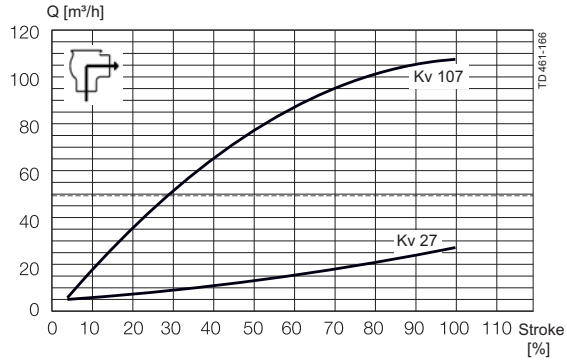
Valve Size 1.5"



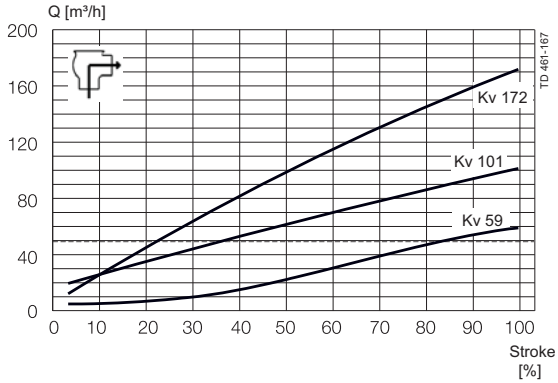
Valve Size 2"



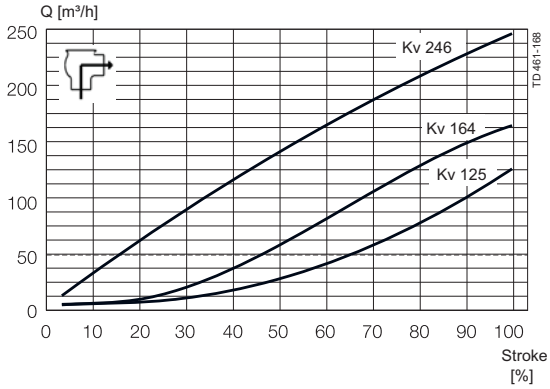
Valve Size 2.5"



Valve Size 3"



Valve Size 4"



Note!
For the diagrams the following applies:
Medium: Water (20° C/68° F)

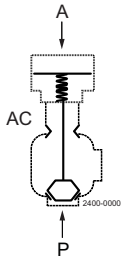
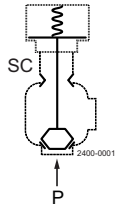
Measurement: In accordance with VDI 2173
-------- (dotted line) = Kv 49

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

Pressure data

Table 1 - Shut-off valves

Max. pressure in bar without leakage at the valve seat

Actuator / Valve body combination and direction of pressure	Air pressure [bar]	Plug position	Valve size [mm]				
			DN40/38	DN50/51	DN65/63.5	DN80/76.1	DN100/101.6
	6	NO	7.60	9.60	5.60	7.20	4.80
		NC	6.29	7.20	4.20	6.40	4.20

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

How to Use Data to Select Valve Size

After the Kv 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 the previous page you will find that the Kv factor (49) is marked on the chart. You will find that a 2" valve crosses 1 Kv curve, 2½" 1 curve, 3" 3 curves and 4" 3 curves. The correct valve size to use is 2" because Kv 49 crosses the curve closest to the optimum operating point 50%. Alternatively the 4" valve is also close to the 50%.

Valve Sizing

Flow Coefficients (Kv)

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:

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

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 m^3 per hour
SG =Specific gravity of product
Δ P = Pressure drop across valve in bar
(inlet pressure minus outlet pressure)

Example of Kv Calculation:

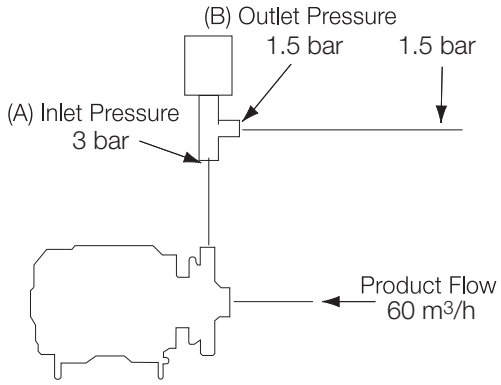
Determine the proper size valve for 60 m^3 per hour of water.

Inlet pressure of 3 bar
Outlet pressure of 1,5 bar

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

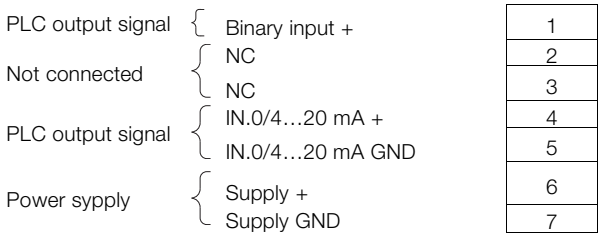
Δ P = 3 bar - 1,5 bar = 1,5 bar

$$Kv = \frac{60}{\sqrt{1,5}} = 49$$

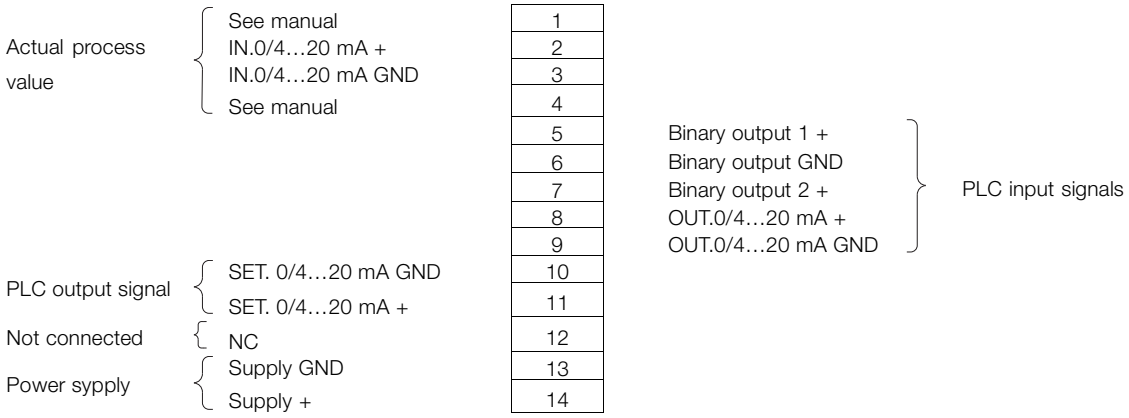


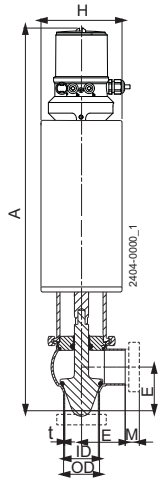
Electrical connection

Positioner 8694
Without display
Terminal strip



Positioner 8692
With display
Terminal strip





Dimensions (mm)

	38 / DN40	51 / DN50	63.5 / DN65	76.1 / DN80	101.6 / DN100
A (with positioner 8692)	474	524	550	583	630
A (with positioner 8694)	514	564	590	623	670
OD	38	51	64	76	102
ID	35	48	60	76	98
t	2	2	2	2	2
E	50	62	82	87	120
H	85	115	115	154	154
M/ Clamp	13	13	13	13	16
Weight (kg)					
Shut-off valve	7.3	9.5	10.5	16.4	18.6

Air Connections Compressed air:

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

ESE02071EN 1201

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