Alfa Laval Unique RV-P

Regulating valves

Introduction

The Alfa Laval Unique RV-P Regulating Valve is an automatic hygienic regulating valve with an electro-pneumatic actuator for use in applications that require precision control of flow as well as pressure, temperature, and tank fluid levels.



Application

The Unique RV-P Regulating Valve is designed for precise flow control in the dairy, food, beverage, biotechnology, pharmaceutical and many other industries.

Benefits

- Precision flow control
- Advanced hygienic valve design
- Dedicated protection
- Reliable operation
- Large operating range

Standard design

Built on the Alfa Laval Unique SSV platform, the Unique RV-P Regulating Valve consists of valve body, valve plug, lip seal, and an external normally open (NO) actuator with bonnet. The actuator is fitted to the valve body by means of a clamp. The Kv value is flexible as lower element can be exchanged. Manual and aseptic versions are available. Upon request, the valve can also be supplied with a normally closed (NC) actuator.

Working principle

The Alfa Laval Unique RV-P Regulating Valve is controlled from a remote location by means of compressed air. An actuator with an integrated IP converter IP converter transforms the electrical signal to a pneumatic signal. This signal conversion is based on a highly accurate and reliable contactless AMR sensor, making it insensitive to vibrations and pressure shocks. The pneumatic signal is transmitted to the integrated positioner which operates by means of the force-balance principle, ensuring that the position of the actuator piston is directly proportional to the input signal. Signal range and zero point can be adjusted individually. The actuator can be used for split-range operation by using a different measuring spring.

Certificates

Authorized to carry the 3A symbol

Technical Data

Valves	
Max. product pressure:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Temperature range (EPDM):	-10 °C to 140 °C
Flow range Kv (Δ P = 1bar):	0.5 to 110 m^3/h
Max. pressure drop:	500 kPa (5 bar)

Actuator	
Air connection:	R1/8" BSP thread with air fitting for 6 mm hose
Max. pressure:	600 kPa (6 bar)
Working pressure:	400 kPa (4 bar)
Air quality:	ISO 8573-1, Class 0.2.4

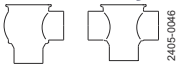
I/P converter	
Signal range:	4 - 20 mA (standard)
Input resistance:	200 Ω
Inductivity/capacitance:	Negligible

Physical Data

Materials, Valves	
Product wetted steel parts:	Stainless steel, 1.4404 (AISI 316L)
Other steel parts:	Stainless steel, 1.4301 (AISI 304)
Product wetted seals:	EPDM
External finish:	Semi-bright (blasted)
Internal finish:	Bright (polished), Ra<0.8 µm

Materials, Actuator	
Actuator cases:	Aluminium with plastic coating
Diaphragms:	NBR with reinforced fabric insert
Springs:	Stainless steel uncovered/spring steel epoxy resin coated
Actuator stem:	Polyamide
Screws, nuts:	Stainless steel, polyamide
Other parts:	Stainless steel

Valve body combinations



200 300

Accuracy

Deviation:	≤1.5%
Hysteresis:	≤0.5%
Sensitivity:	<0.1%
Influence of air supply pressure:	≤0.1% between 1.4 and 6 bar

Air consumption at steady state condition:	With 0.6 bar signal pressure and supply pressures up to 6 bar ≤100 ln/h

Ambient temperature:	-25 °C to +70 °C

Protection class:	IP66

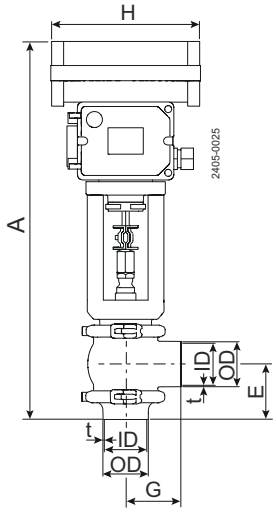
Flow sizes/tube connections

Kv	Seat diam. (mm)	Tube connections (mm)	
		ISO	DIN/DN
0.5 E	6	38	40
1.0 E	10	38	40
2 E	12	38	40
4 E	14	38	40
8 E	23	38	40
16 E	29	38	40
25 E	38	51	50
32 E	48.5	51	50
40 E	42	63.5	65
64 L	51	63.5	65
75 L	51	76.1	80
110 L	72	101.6	100

Options

- Product wetted seals of HNBR or Fluorinated rubber (FPM)
- Profibus communication
- Aseptic configuration Max 8 bar

Dimensions (mm)



Size	38	51	63.5	76.1	101.6	DN40	DN50	DN65	DN80	DN100
	NO/NC	NO/NC	NO/NC	NO/NC	NO/NC	NO/NC	NO/NC	NO/NC	NO/NC	NO/NC
A- std	410	423	405	439	481	412	425	411	447	483
A- aseptic	411	426	412	446	488	414	427	418	454	490
E	56	63	67	85	96	57	64	70	89	98
G	49.5	61	81	86	119	49.5	62	78	87	120
H	168	168	168	168	280	168	168	168	168	280
OD	38	51	63.5	76.1	101.6	41	53	70	85	104
ID	34.8	47.8	60.3	72.9	97.6	38	50	66	81	100
t	1.6	1.6	1.6	1.6	2	1.5	1.5	2	2	2
M/ISO clamp	21	21	21	21	21	-	-	-	-	-
M/DIN clamp	-	-	-	-	-	21	21	28	28	28
M/DIN male	-	-	-	-	-	22	23	25	25	30
M/SMS male	20	20	24	24	35	-	-	-	-	-
Weight kg	8.2	9.3	9.7	11.2	24.9	8.2	9.3	9.7	11.2	24.9

Capacity diagram

For Δ P= 100 kPa (1bar).

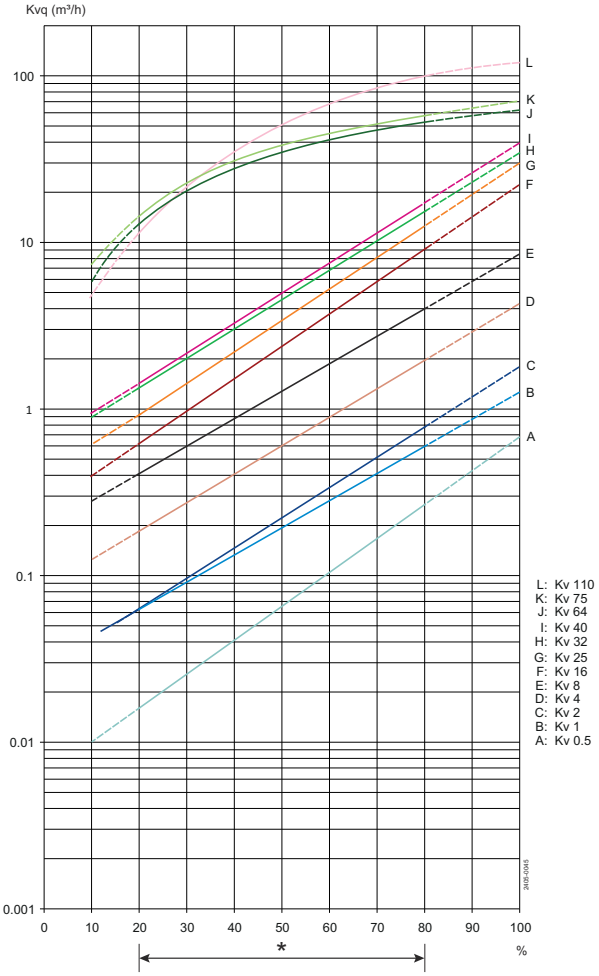


Figure 1. Standard

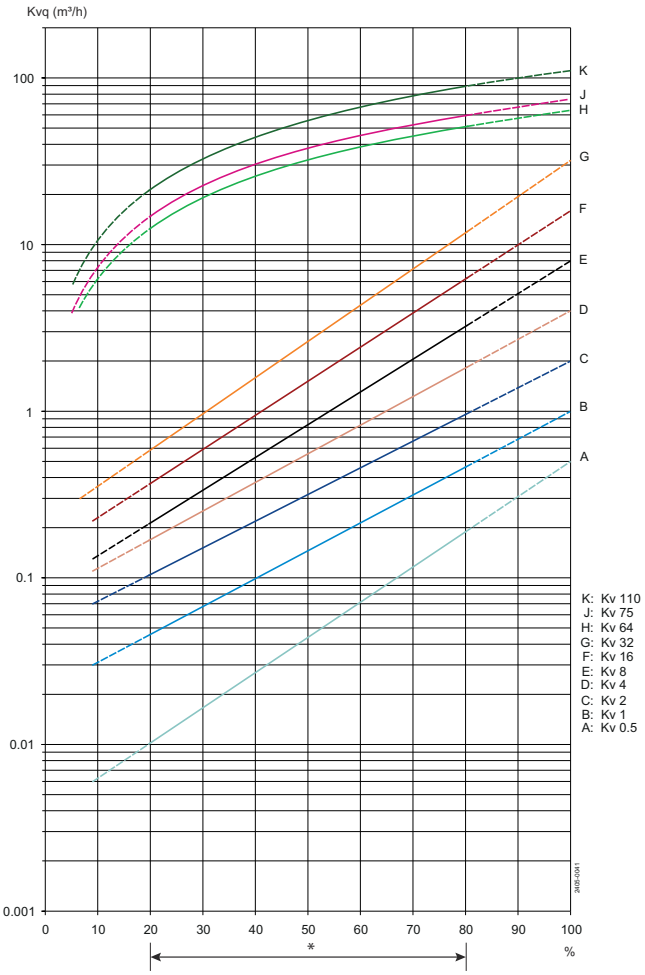


Figure 2. Aseptic

*Recommended working area

Note! For the diagram the following applies:
Medium: Water (20 °C).
Measurement: In accordance with VDI 2173.
Alfa Laval recommend max. flow velocity in tubing and valves to be 5 m/sec.

Conversion Table

100 kPa = 1 bar = 14.5 PSI

10 mm = 0.39 inch

10 m^3/h = 44.03 US GPM

Pressure drop calculation

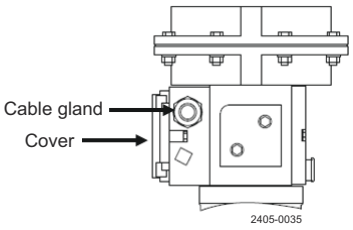
The Kv designation is the flow rate in m^3/h at a pressure drop of 1 bar when the valve is fully open (water at 20°C or similar liquids). To select the Kv value it is necessary to calculate the Kv_q value using the following formula:

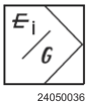
$$Kv_q = \frac{Q}{\sqrt{\Delta p}}$$

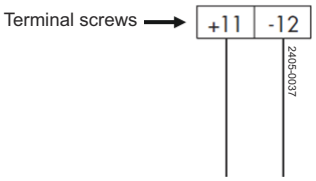
Where:
Kv_q = Kv value at specific flow and specific pressure drop
Q = Flow rate (m^3/h)
Δ P = Pressure drop over valve (bar)

Electrical connection

Electrical connection - Analogue 4-20 mA
Positioner 3725





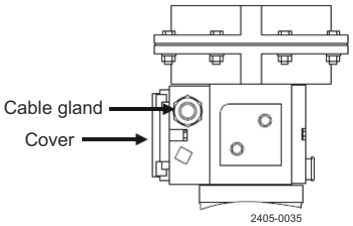


4-20 mA control signal

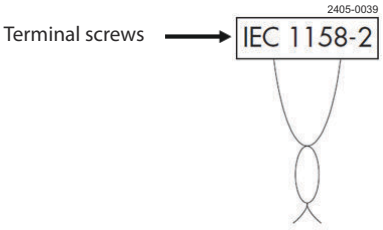
Route the two-wire line to the screw terminals marked “11 and 12”, whereby the correct polarity has to be ensured

1. Open the cover of the positioner for electrical connection
2. Fit the cable through the cable gland and connect the cable wires to the terminal screws. (+11 and -12)
3. Tighten the cable gland and close the cover of the positioner

Electrical connection - Profibus PA
Positioner 3730-4







Bus control signal
Route the two-wire bus line to the screw terminals marked “IEC 1158-2”, whereby no polarity has to be observed

1. Open the cover of the positioner for electrical connection
2. Fit the bus cable through the cable gland and connect the cable wires to the terminal screws. (IEC 1158-2)
3. Tighten the cable gland and close the cover of the positioner

By searching on positioner type 3730-4 you can either retrieve the GSD files for PROFIBUS PA communication directly from the World Wide Web server of Samson or the PROFIBUS User Organization

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