

Alfa Laval CPM

Regulating valves

Introduction

The Alfa Laval CPM Constant-Pressure Modulating Valve is a pneumatic regulating valve that maintains a constant pressure in hygienic process lines at the valve inlet or outlet. Safe, reliable and easy to clean, these regulating valves provide accurate pressure control, quickly adjusting position to maintain the pressure at pre-set values without any need for electronic control.

Application

This pneumatic regulating valve maintains uniform inlet or outlet pressure in hygienic process lines for the dairy, food, beverage, personal care and many other industries. Typical applications include filling and bottling equipment.

Benefits

- Safe, effective pressure control
- Self-draining design
- Excellent valve cleanability
- Easy to install, simple to operate
- High hygienic level

Standard design

The CPM Constant-Pressure Modulating Valve is available in two versions: the CPMI-2, the CPMO-2. The CPMI-2 and the CPMO-2 consist of a valve body with valve seat, cover, valve plug with a special diaphragm, and clamp. The diaphragm consists of two flexible PTFE and EPDM diaphragms supported by 12 stainless steel sectors between them. The cover and the valve body are clamped together. The valve body and the seat are welded together.

Working principle

The Alfa Laval CPM Constant-Pressure Modulating Valve is controlled from a remote location by means of compressed air. A diaphragm or valve plug system reacts immediately to any alteration of product pressure and adjusts its position accordingly to maintain a constant inlet and outlet pressure at pre-set values.

Certificates

CPMI-2 and CPMO-2 are authorized to carry the 3A Symbol



TECHNICAL DATA

Pressure

Max. product pressure:	145 PSI
Min. product pressure:	0 PSI
Air pressure (CPMI-2/CPMO-2):	0 to 116 PSI

Temperature range:

With upper diaphragm NBR and lower PTFE/EPDM:	14 °F to 203 °F
With upper diaphragm PTFE/EPDM and lower PTFE/EPDM:	14 °F to 284 °F

ATEX

Classification:	II 3 G D ¹
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¹This equipment is outside the scope of the directive 2014/34/EU and must not carry a separate CE marking according to the directive as the equipment has no own ignition source.

Flow

Flow Kv 23, fully open ($\Delta p = 14.5$ PSI):	Approx 812 gpm
Flow Kv 7 ($\Delta p = 14.5$ PSI):	Approx 247 gpm
Flow Kv 9 ($\Delta p = 14.5$ PSI):	Approx 317.8 gpm
Flow Kv2/15, low capacity ($\Delta p = 14.5$ PSI):	Approx 70.6 gpm
(Alternative size):	(regulating area). Approx. 529.7 gpm. (CIP area)

PHYSICAL DATA

Materials

Product wetted steel parts:	Acid-resistant steel AISI 316 L
Other steel parts:	Stainless steel AISI 304
Lower diaphragm:	PTFE covered EPDM rubber
Upper diaphragm:	NBR
Finish	32 RA

Surface finish choose from the following:

Standard	
Internal/external semi-bright:	Ra ≤ 62 µin
Optional	
Inside/outside:	Ra ≤ 32 µin or 20 µin

Air Connections

R 1/4" (BSP), internal thread:	
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Options

- Male parts or clamp liners in accordance with required standard.
- Pressure gauge 0-87 PSI, 1.5-inch
- Pressure gauge 0-145 PSI, 1.5-inch
- Air pressure regulating valve kit, 0-116 PSI (D)
- Air throttling valve for adjustment of regulating speed for the CPM-2 valve
- Booster for product pressure exceeding the available air pressure (Product pressure = 1.8 x air pressure)
- 3A (hygienic Standard) labelling on request for CPM-2 valves

Material grades CPM-2

- Upper diaphragm of PTFE covered EPDM and O-ring of Fluorinated rubber (FPM) covered EPDM rubber (for temperature 203 - 284 °F)
- Both diaphragms of solid PTFE and O-ring of Fluorinated rubber (FPM) (for temperatures above 284 °F)

Principle

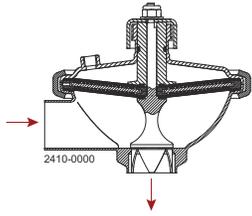


Figure 1. CPMI-2: Reduced product pressure

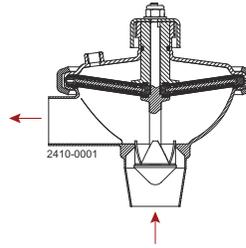


Figure 2. CPMO-2

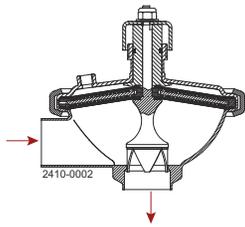


Figure 3. CPMI-2: Increased product pressure

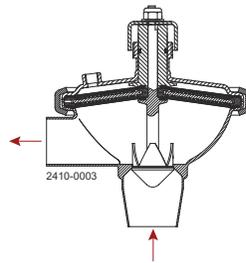


Figure 4. CPMO-2

CPMI-2 opens at increasing product pressure and vice versa.

CPMO-2 closes at increasing product pressure and vice versa.

Diaphragm Unit

CPMI-2 and CPMO-2: The diaphragm unit consists of a stainless steel disc which is divided into sectors and of flexible diaphragms which are placed on each side of the sectors.



Note!

For further details, see also instructions ESE01825 and ESE01834.

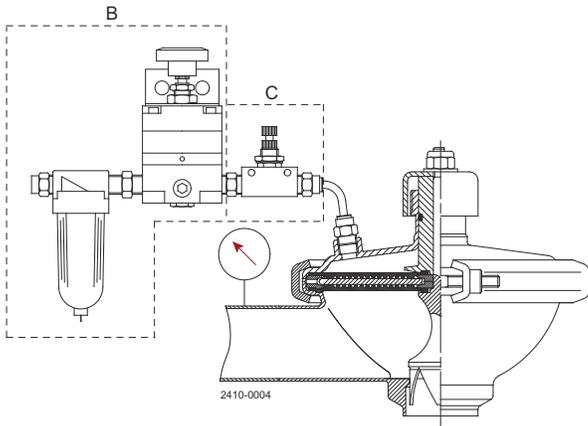


Figure 5. CPMI-2 with pressure regulating valve and pressure gauge

The valves operate without a transmitter in the product line and require only a pressure regulating valve for the compressed air and a pressure gauge in the product line.

Pressure drop/capacity diagrams

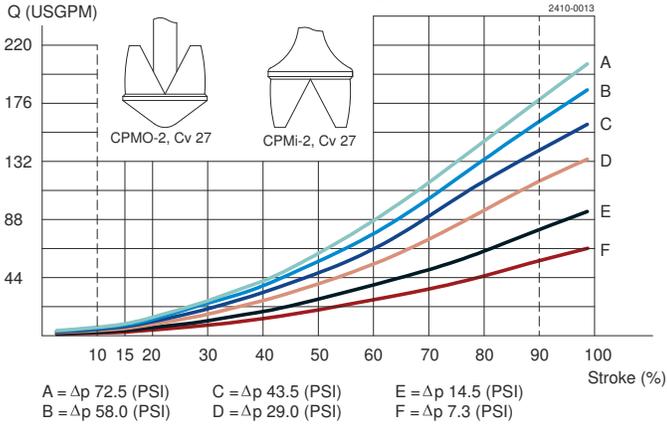


Figure 6. CPM-2, Cv 27

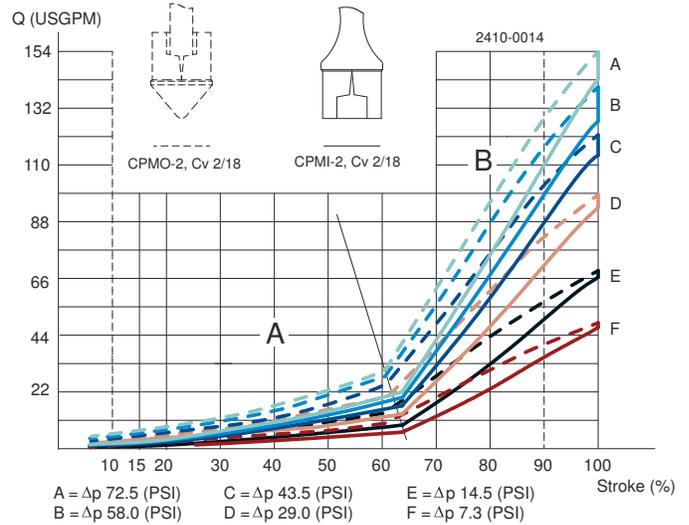


Figure 7. CPM-2, Cv 2/18

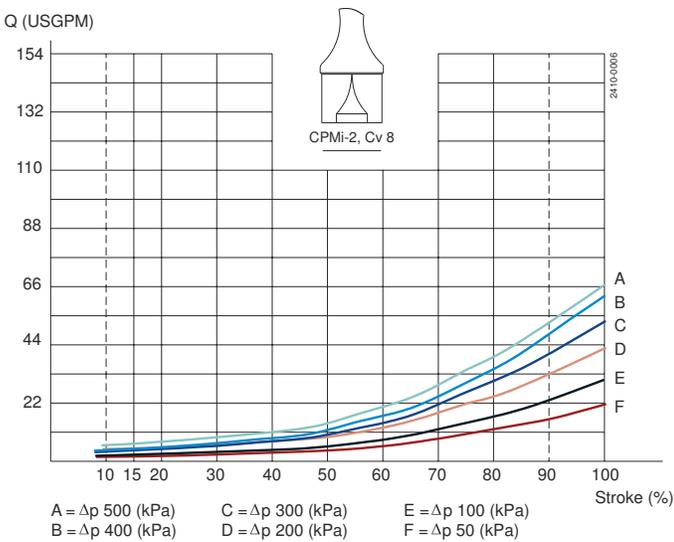


Figure 8. CPMI-2, Cv 8

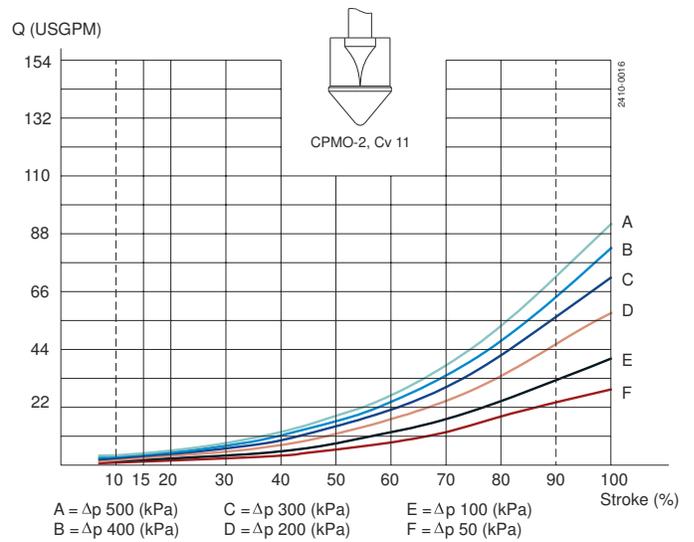


Figure 9. CPMO-2, Cv 11



Note!

For all diagrams the following applies:
 Medium: Water (68° F)
 Measurement: In accordance with DI 2173
 Alfa Laval recommend max. flow velocity in tubing and valves to be 5 m/sec.

Example 1:

Pressure drop Δp = 29 PSI

Flow Q = 35.2 GPM Select: CPM-2

Cv 27 which at working point will be 48% open.

Example 2:

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