# Maintain System Pressure

## CPM Constant-Pressure Modulating Valve

### Concept

CPMI-2 and CPMO-2 are sanitary constant-pressure valves. CPMI-2 (Constant-Pressure Modulating Inlet) maintain a constant pressure in the process line at the inlet side of the valve. Typical applications are after separators, heat exchangers or overflow valves. CPMO-2 (Constant-Pressure Modulating Outlet) maintains a constant pressure in the process line at the outlet side of the valve. Typical applications are before filling/bottling machines etc.

### Working principle

The valves are remote-controlled by means of compressed air. A diaphragm/valve plug system reacts immediately to any alteration of the product pressure and changes position so that the preset pressure is maintained.

### Standard design

The CPMI-2 and CPMO-2 consist of a valve body with valve seat, cover, a valve plug with a diaphragm unit and a clamp. The cover and the valve body are clamped together. The valve body and the seat are welded together. The cover and the valve bodies are clamped together.

### TECHNICAL DATA

| | |
|---|---|
| Max. product pressure | 145 PSI |
| Min. product pressure | 0 PSI |
| Temperature range: | 14° F to 203° F |
| Temperature range with upper diaphragm in PTFE/EPDM | 14° F to 286° F (Higher on request) |
| Air pressure (CPMI-2/CMPO-2) | 0 to 116 PSI |
| Flow Kv 23, fully open (Dp = 14.5 psi): | Approx 812 gpm |
| Flow Kv 7 (Δp = 14.5 psi): | Approx 247 gpm |
| Flow Kv 9 (Δp = 14.5 psi): | Approx 317.8 gpm. |
| Flow Kv2/15, low capacity (Δp = 14.5 psi): | Approx 70.6 gpm |
| (Alternative size) | (regulating area). Approx. 529.7 gpm. (CIP area). |

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

### 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 |

#### Air Connections

R 1/4" (BSP), internal thread.

Authorized to carry the 3A symbol

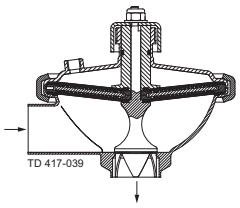
## Options

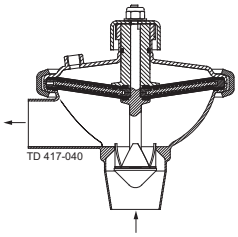
A. Male parts or clamp liners in accordance with required standard.
B. Pressure gauge 0-87 PSI, 1.5-inch
   Pressure gauge 0-145 PSI, 1.5-inch
C. Air pressure regulating valve kit, 0-116 PSI (D).
D. Air throttling valve for adjustment of regulating speed for the CPM-2 valve.
E. Booster for product pressure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

## Material grades CPM-2

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

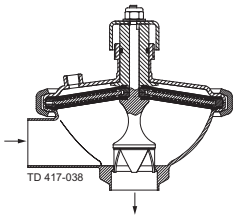
Fig. 1. Principle

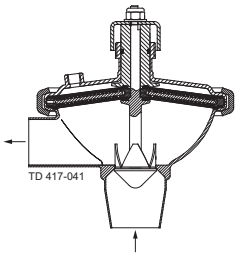



CPMI-2 CPMO-2

a. Reduced product pressure.




CPMI-2 CPMO-2

b. Increased product pressure.

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

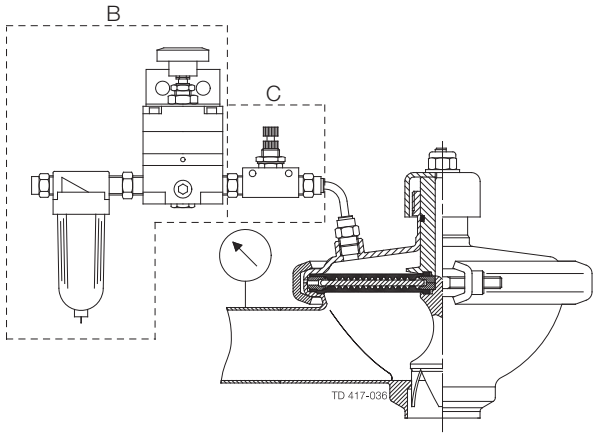
## Diaphragm Unit

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

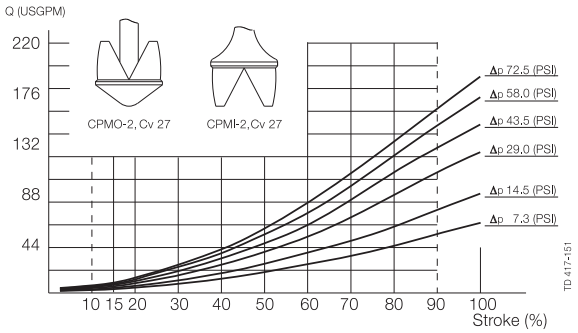
Fig. 2. CPMI-2 with pressure regulating valve and pressure gauge.



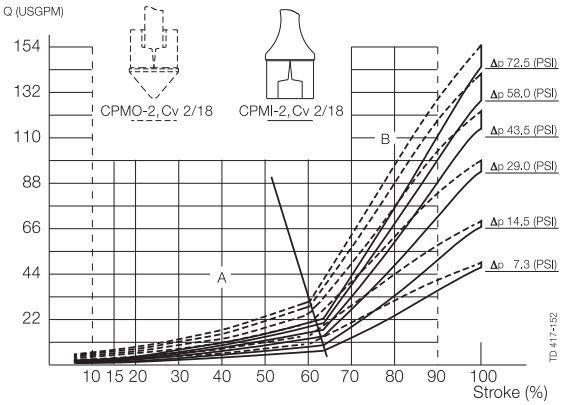

The valves operate without a transmitter in the product line and require only a pressure regulating valve for the compressed air and a pressure gauge in the product line.

## Pressure drop/capacity diagrams

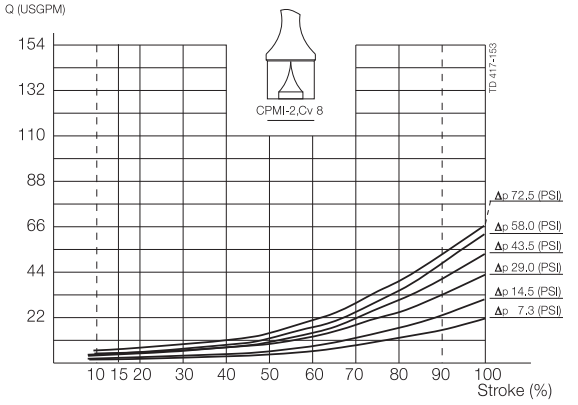
### CPM-2, Cv 27



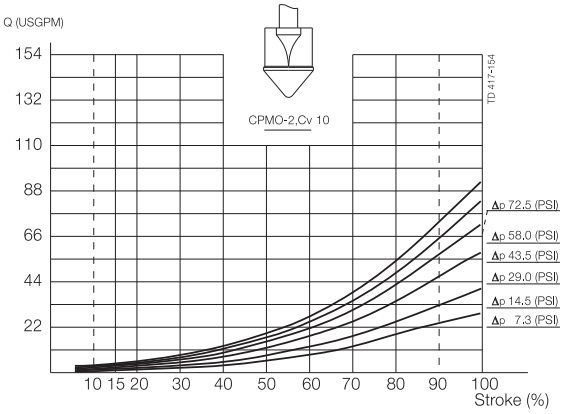

### CPM-2, Cv 2/18




### CPMI-2, Cv 8




### 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:**

CPMI-2:
Pressure drop Δp = 43.5 PSI
Flow Q = 4.4 GPM
Select: CPMI-2, Cv 2/18 which at working point will be approx. 35% open equal to about 50% of the regulating area.

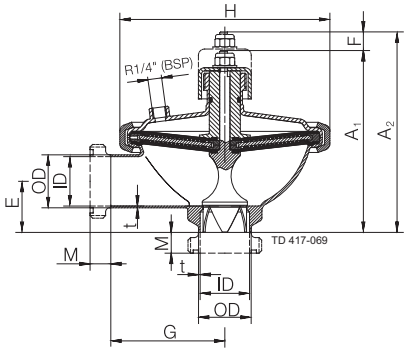
**Example of using the diagram:**

1. Pressure drop Δp = 36 PSI
2. Flow =220 GPM

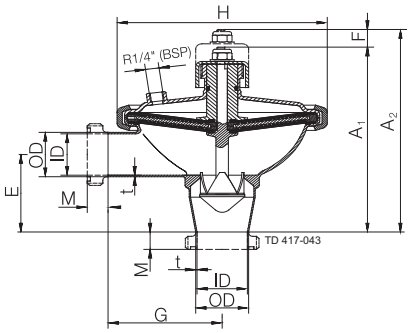
The intersection is on the 50% curve.

**Note!**

Always try to get as near as possible to the 50% open curve.




a. CPMI-2.




b. CPMO-2

**Dimensions (in.)**

| Size | CPMI-2 | | | CPMO-2 | | |
|---|---|---|---|---|---|---|
| | Cv 27 | Cv 8 | Cv 2/18 | Cv 27 | Cv 11 | Cv 2/18 |
| A1 | 7.96 | 7.96 | 7.96 | 9.40 | 7.96 | 7.96 |
| A2 | 8.80 | 8.80 | 8.80 | 10.44 | 8.80 | 8.80 |
| C | - | - | - | - | - | - |
| OD | 2.31 | 2.31 | 2.31 | 2.31 | 2.31 | 2.31 |
| ID | 2.16 | 2.16 | 2.16 | 2.16 | 2.16 | 2.16 |
| t | 0.073 | 0.073 | 0.073 | 0.073 | 0.073 | 0.073 |
| E | 2.23 | 2.23 | 2.23 | 4.05 | 2.23 | 2.23 |
| F | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| G | 5.01 | 5.01 | 5.01 | 5.01 | 5.01 | 5.01 |
| H | 9.24 | 9.24 | 9.24 | 9.24 | 9.24 | 9.24 |
| Tri-Clamp® | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Seat Diameter | 1.91 | 1.41 | 1.41 | 1.91 | 1.41 | 1.41 |
| Weight (lb.) | 13.99 | 13.99 | 13.99 | 13.99 | 13.99 | 13.99 |



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