



Maintain System Pressure

Alfa Laval CPM Constant-Pressure Modulating Valve

Concept

CPMI-2, CPMI-D60 and CPMO-2 are sanitary constant-pressure valves. CPMI-2 and CPMI-D60 (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 CPM-I-D60 consists of upper and lower valve bodies, an inlet tube, a cover, a valve plug with diaphragm unit and clamps. The cover and the valve bodies are clamped together.



TECHNICAL DATA

Max. product pressure: 1000 kPa (10 bar).
Max. product pressure 145 PSI
Min. product pressure: 0 kPa (0 bar).
Min. product pressure 0 PSI
Temperature range: 10°C to 95°C (EPDM).
Temperature range: 14° F to 203° F
Temperature range with upper diaphragm
in PTFE/EPDM: 10° C to +140° C.
(Higher on request).
Temperature range with upper diaphragm
in PTFE/EPDM 14° F to 286° F
(Higher on request)
Air pressure (CPMI-2/CPMO-2): 0 to 800 kPa (0 to 8 bar).
Air pressure (CPMI-2/CMPO-2) 0 to 116 PSI
Air pressure (CPM-I-D60): 0 to 600 kPa (0 to 6 bar).
Flow Kv 23, fully open (Dp = 1 bar): Approx 23 m³/h.
Flow Kv 23, fully open (Dp = 14.5 psi): Approx 812 gpm
Flow Kv 7 (Δp = 1 bar): Approx 7 m³/h.
Flow Kv 7 (Δp = 14.5 psi): Approx 247 gpm
Flow Kv 9 (Δp = 1 bar): Approx 9 m³/h.
Flow Kv 9 (Δp = 14.5 psi): Approx 317.8 gpm.
Flow Kv2/15, low capacity (Δp = 1 bar): Approx 2 m³/h.
Flow Kv2/15, low capacity (Δp = 14.5
psi): Approx 70.6 gpm
(Alternative size) (regulating area). Approx. 15
m³/h. (CIP area).
(Alternative size) (regulating area). Approx.
529.7 gpm. (CIP area).
Flow range Kv60, fully open (Δp = 1 bar)
(CPM-I-D60) Approx 60 m³/h.
CPMI-2 and CPMO-2 are authorized to carry the 3A Symbol

PHYSICAL DATA

Materials
Product wetted steel parts: 1.4404 (316L).
Product wetted steel parts: Acid-resistant steel AISI 316 L
Other steel parts: 1.4301(304).
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.

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, 0-8 bar.
- D. Air pressure regulating valve kit, 0-116 PSI (D).
- E. Air throttling valve for adjustment of regulating speed for the CPM-2 valve.
- F. Booster for product pressure exceeding the available air pressure.
(Product pressure = 1.8 x air pressure).
- G. US 3A version available on request for CPM-2 valves only
- H. 3A (Sanitary Standard) labelling on request for CPM-2 Valves.

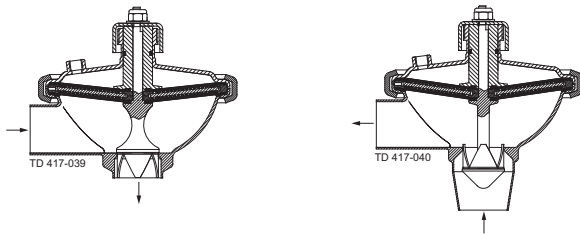
Material grades CPM-2

- I. Upper diaphragm of PTFE covered EPDM and O-ring of FPM covered EPDM, (for temperature 95-140°C).
- J. Upper diaphragm of PTFE covered EPDM and O-ring of Fluorinated rubber (FPM) covered EPDM rubber, (for temperature 203 - 284°F).
- K. Both diaphragms of solid PTFE and O-ring of FPM (for temperatures above 140°C).
- L. Both diaphragms of solid PTFE and O-ring of Fluorinated rubber (FPM) (for temperatures above 284°F).

Material grades CPM-I-D60

- M. Upper diaphragm of PTFE covered EPDM.
- N. Valve body seal rings of NBR or FPM.
- O. Guide O-ring of FPM (for temperatures above 95°C).

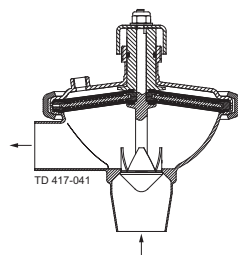
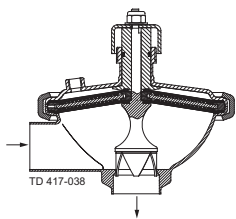
Fig. 1. Principle



CPMI-2

a. Reduced product pressure.

CPMO-2



CPMI-2

b. Increased product pressure.

CPMO-2

CPMI-2 and CPM-I-D60 opens at increasing product pressure and vice versa.

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

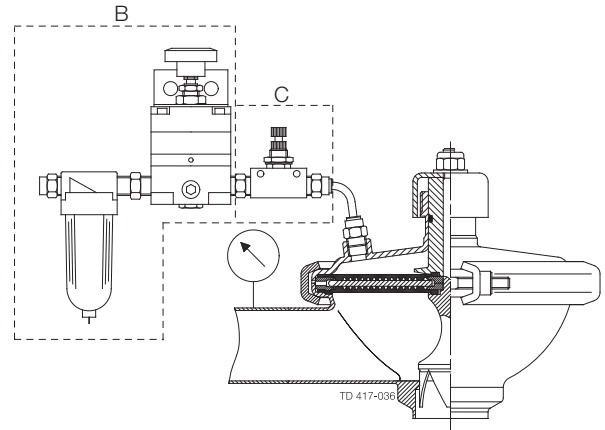
Diaphragm Unit

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. CPM-I-D60: The diaphragm unit consists of two flexible diaphragms supported by 12 stainless steel sectors in between them.

Note!

For further details, see also instructions ESE01825 and ESE01834

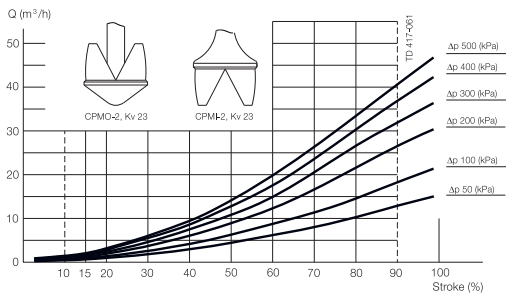
Fig. 2. CPMI-2 with pressure regulating valve and pressure gauge.



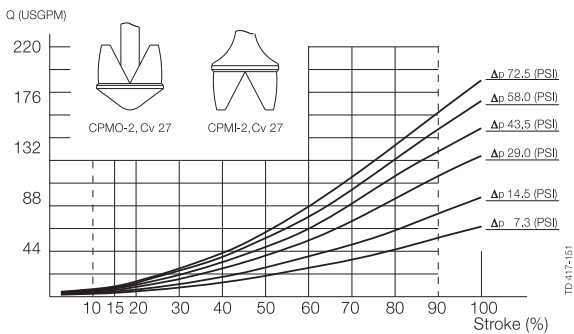
The valves operate without a transmitter in the product line and require only a pressure regulating valve for the compressed air and a pressure gauge in the product line.

Pressure drop/capacity diagrams

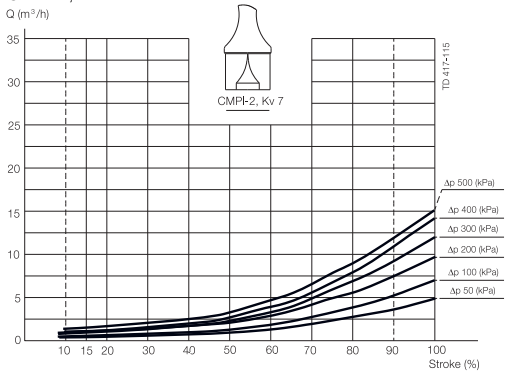
CPM-2, Kv 23



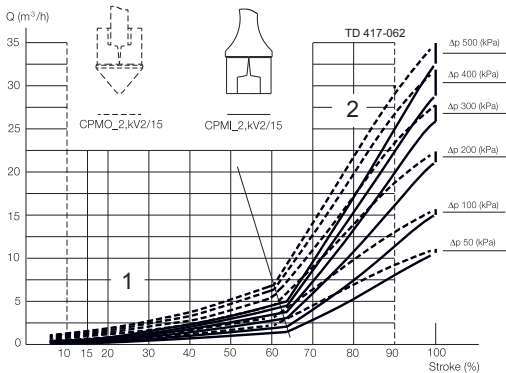
CPM-2, Cv 27



CPMI-2, Kv 7



CPM-2, Kv 2/15



Note!

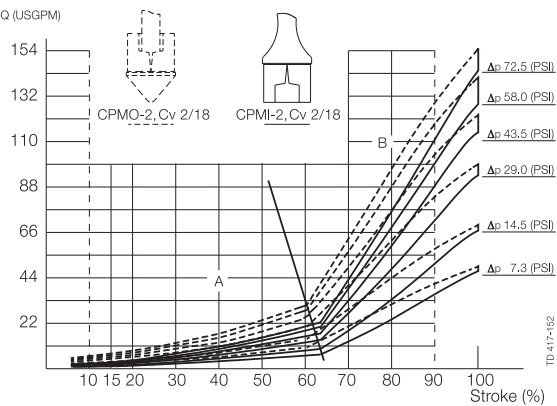
For all diagrams the following applies:

Medium: Water (20°C).

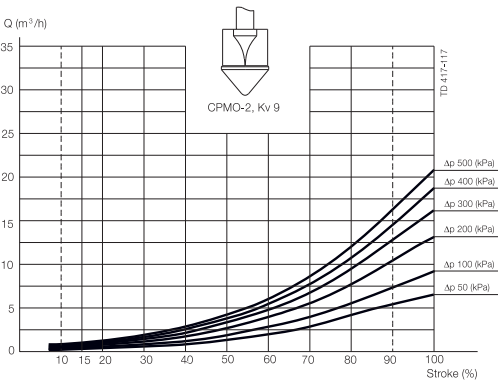
Measurement: In accordance with VDI 2173.

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

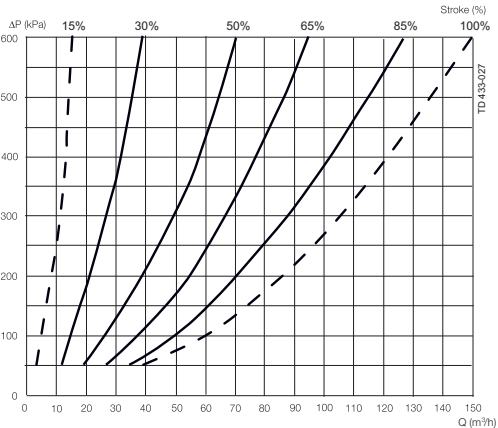
CPM-2, Cv 2/18



CPMO-2, Kv 9



CPM-I-D, Kv 60



Example 1:

Pressure drop $\Delta p = 200$ kPa.

Flow $Q = 8$ m³/h.

Select: CPMI-2, Kv 23 which at working point will be 48% open.

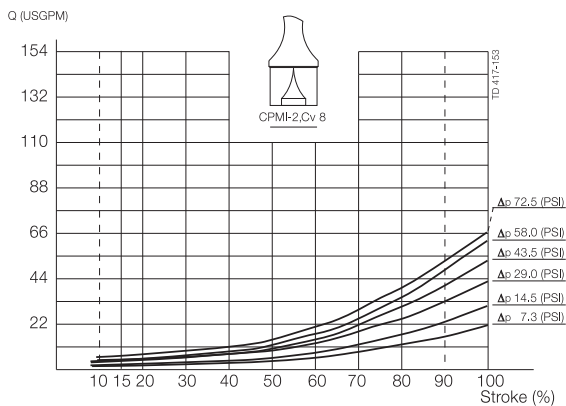
Example 2:

CPMI-2:

Pressure drop $\Delta p = 300$ kPa.

Flow $Q = 1$ m³/h.

Select: CPMI-2, Kv 2/15 which at working point will be approx. 35% open equal to about 50% of the regulating area.

CPMI-2, Cv 8**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 of using the diagram:

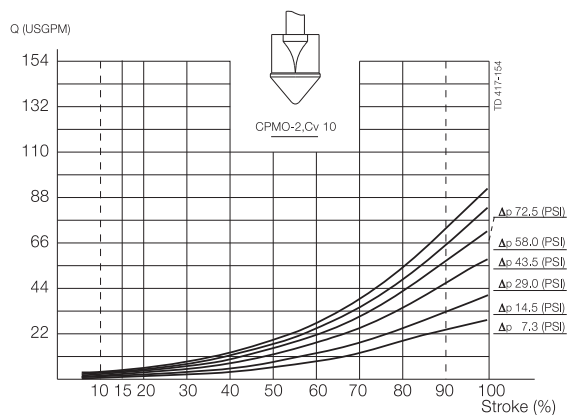
1. Pressure drop $\Delta p = 300$ kPa.

2. Flow = 50m³/h.

The intersection is on the 50% curve.

Notel

Always try to get as close as possible to the 50% open curve. If the CPMI-2-D60 is too big select from the CPMI-2 curves.

CPMO-2, Cv 11**Example 1:**

Pressure drop $\Delta p = 29$ PSI

Flow $Q = 35.2$ GPM

Select: CPMI-2, Cv 27 which at working point will be 48% open.

Example 2:

CPMI-2:

Pressure drop $\Delta p = 43.5$ 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:

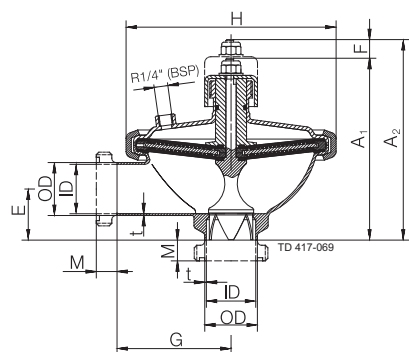
1. Pressure drop $\Delta p = 36$ PSI

2. Flow = 220 GPM

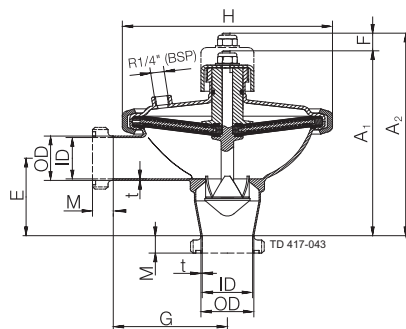
The intersection is on the 50% curve.

Notel

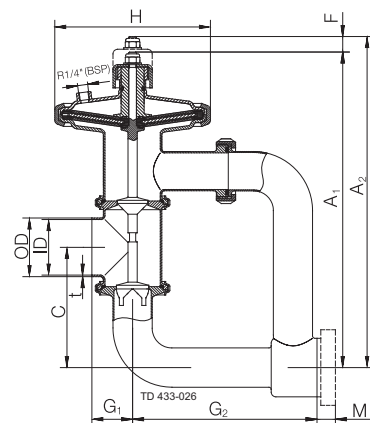
Always try to get as near as possible to the 50% open curve.



a. CPMI-2.



b. CPMO-2



c. CPM-I-D60.

Dimensions (mm)

Size	CPMI-2			CPMO-2			CPM-I-D60
	Kv 23	Kv 7	Kv 2/15	Kv 23	Kv 9	Kv 2/15	76 mm
A1	175.1	175.1	175.1	211	175.1	175.1	413.2
A2	193.4	193.4	193.4	229.3	229.3	193.4	430
C	-	-	-	-	-	-	155
OD (Inch/DN)	53/50.8	53/50.8	53/50.8	53/50.8	53/50.8	53/50.8	76
ID (Inch/DN)	50/47.6	50/47.6	50/47.6	50/47.6	50/47.6	50/47.6	72
t (Inch/DN)	1.6/1.5	1.6/1.5	1.6/1.5	1.6/1.5	1.6/1.5	1.6/1.5	2
E (Inch/DN)	50/49.2	50/49.2	50/49.2	50/49.2	50/49.2	50/49.2	
F	18.3	18.3	18.3	18.3	18.3	18.3	16.8
G	110	110	110	110	110	110	
G1	-	-	-	-	-	-	53
G2	-	-	-	-	-	-	240
H	203	203	203	203	203	203	200
M/ISO clamp	21	21	21	21	21	21	21
M/ISO male	21	21	21	21	21	21	21
M/DIN male	22	22	22	22	22	22	30
M/SMS male	20	20	20	20	20	20	24
M/BS male	22	22	22	22	22	22	22
Seat diameter	42	31	31	42	31	31	
Weight (kg)	5.5	5.5	5.5	5.5	5.5	5.5	10

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