

# Mark 686/686G Series

## Air-Loaded Cage Trim Pressure Regulators

The Mark 686 is a cage trim pressure reducing valve that features air-loading, high capacities, accurate regulation, and easy servicing, making it an exceptional choice for your pressure regulating applications. The bottom-entry cage trim allows simple cleaning or repair – all working trim parts can be removed from the body as one assembly. The diaphragm is easily accessible from the top, allowing maintenance without removing the valve from the line.

### OPERATION

The set point is adjusted by controlling the air pressure that is supplied to the top of the diaphragm. The supplied air pressure opens the valve to allow the process media to pass through the seats. The downstream pressure is sensed beneath the diaphragm through a downstream sensing tap. As the downstream pressure exceeds the loading pressure, the plug moves toward the closed position.



### FEATURES

- Easy to maintain and service — remove bottom entry cage to access plug. Diaphragm is accessible from the top
- Large effective diaphragm area — for increased accuracy and sensitivity
- Large orifices and body passages — provides high flow capacities
- Tight shutoff — choice of hard (ANSI Class IV) or soft (ANSI Class VI bubble-tight) seat
- For applications with differential pressure up to 300 psi (20,7 bar) on water, air, oil, gas, steam and chemicals



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**SPECIFICATIONS**

**Sizes:** 1/4" through 2" (DN8 through DN50)

**End Connections**

- Threaded – NPT, BSPT, BSPP, Socket Weld
- Flanged – 150#, 300#, PN10, PN16, PN25, PN40

**Body Materials**

- Ductile Iron
- Bronze
- Carbon Steel
- Stainless Steel

**Plug:** 17-4 Ph Stainless Steel

**Plug Seat**

- Buna-N
- Viton
- Hardened 17-4 Ph Stainless Steel

**Cage (with hardened nickel plating)**

- BR, DI or CS body valves: steel
- SS body valves: 303 Stainless Steel

**Cage Seat:** 316 Stainless Steel

**Spring Housing:** Cast Iron

**Diaphragm**

- Standard – Buna-N/Nylon
- Optional – Stainless Steel or Viton/Nomex

**Shutoff**

- Hard Seat – ANSI Class IV
- Soft Seat – ANSI Class VI for bubble-tight shutoff

**Maximum Inlet Pressure:** 300 psi (20,7 bar)

**Maximum Temperature:** 200°F (93°C) with Buna-N seats and diaphragm; 350°F (177°C) with Viton seats and Viton or SST diaphragm

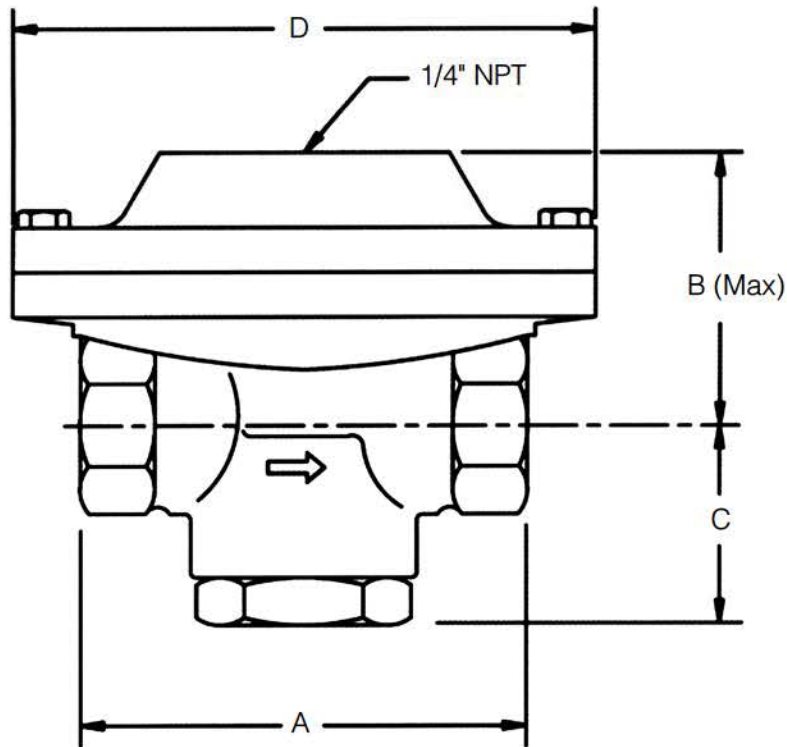
**Minimum Temperature:** -20°F (-29°C) with Buna-N seats and diaphragm; 0°F (-18°C) with Viton seats and diaphragm ; -15°F (-26°C) with SST diaphragm and SST or Viton seats; -20°F (-29°C) with SST diaphragm and Buna-N seats

**Pressure Recovery Factory  $F_L$ :** 0.9

**Cv (Kv) Values**

Valve Size (DN)	Orifice Size		Valve Flow	
	inches	mm	Cv	Kv
1/4" (DN8)	0.47	12	2.2	1,9
3/8" (DN10)	0.47	12	2.6	2,2
1/2" (DN15)	0.47	12	2.9	2,5
	0.60	15	5.2	4,5
3/4" (DN20)	0.75	19	7.0	6,0
	0.60	15	5.6	4,8
1" (DN25)	0.75	19	7.7	6,6
	1.07	27	13.5	11,6
1-1/4" (DN32)	1.23	31	15.5	13,3
	1.07	27	13.5	11,6
1-1/2" (DN40)	1.23	31	15.6	14,2
	1.23	31	17.0	14,6
2" (DN50)	1.47	37	19.0	16,3

**DIMENSIONS**



• Threaded Ends

Valve Size	Dimensions (Inches)				Weight lbs
	A	B	C	D	
1/4"	5.00	2.09	2.56	5.00	8
3/8"	5.00	2.09	2.56	5.00	8
1/2"	5.00	2.09	2.56	5.00	8
3/4"	5.00	3.04	2.62	6.87	15
1"	5.00	3.04	2.62	6.87	15
1-1/4"	7.50	4.00	3.87	9.38	45
1-1/2"	7.50	4.00	3.87	9.38	45
2"	7.50	4.00	3.87	9.38	45

• Threaded Ends (metric)

Valve Size	Dimensions (mm)				Weight kgs
	A	B	C	D	
DN8	127	53	65	127	3,6
DN10	127	53	65	127	3,6
DN15	127	53	65	127	3,6
DN20	127	77	67	174	6,8
DN25	127	77	67	174	6,8
DN32	191	102	98	238	20,4
DN40	191	102	98	238	20,4
DN50	191	102	98	238	20,4



**ORDERING SCHEMATIC**

Model No	Size	Body Mat'l	1	2	3	4	5	6	7	8	9	10

	Model
686	Standard
686G	Air Loaded Globe Valve

	Size
025	1/4" (DN8)
038	3/8" (DN10)
050	1/2" (DN15)
075	3/4" (DN20)
100	1" (DN25)
125	1-1/4" (DN32)
150	1-1/2" (DN40)
200	2" (DN50)

	Body Material
DI	Ductile Iron
CS	Carbon Steel (WCB)
S6	Stainless Steel (CF8M)
BR	Bronze

1 & 2	End Connections
PT	NPT
BT	BSPT
BP	BSPP
SW	FSW
F1	125#FE
F5	150#FE
F2	250#FE
F3	300#FE
F7	PN10 DIN FE
F6	PN16 DIN FE
F8	PN25 DIN FE
F4	PN40 DIN FE
ZZ	Non-Standard

3 & 4	Plug Seat	Cv (Kv)	
B	Buna-N	1	0.21 (0,18)
V	Viton	2	0.42 (0,36)
J	EPDM	3	0.84 (0,72)
M	Hard	4	1.6 (1,4)
		5	2.2 (1,9)
		6	2.6 (2,2)
		7	2.9 (2,5)
		8	4.4 (3,8)
		9	5.2 (4,5)
		B	5.6 (4,8)
		F	7.0 (6,0)
		G	7.7 (6,6)
		M	13.5 (11,6)
		P	15.5 (13,3)
		Q	16.5 (14,2)
		S	17.0 (14,6)
		W	19.0 (16,3)
ZZ		Non-Standard	

5 & 6	Diaphragm
BN	Buna-N
S6	316SST
VI	Viton
ZZ	Non-Standard

7 & 8	Actuato
MD	For all Diaphragm Materials
ZZ	Non-Standard

9 & 10	Accessories
00	None
S8	18-8SS Bolting
S6	316SS Bolting
SC	Oil-Free Clean
XC	Oxygen Clean
ZZ	Non-Standard

