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SINGLE SEAT BRONZE BODY

- 1/2", 3/4", 1", 1-1/4", 1-1/2", and 2"Screwed NPT Ends
- ANSI Class 250 Body Rating
- ANSI Class IV Close off
- Hardened 17-4 Stainless Steel Trim
- Top and Bottom Stem Guided
- Equal Percent Flow Characteristic
- 46" Pneumatic Diaphragm, Field Reversible Actuators
- Stainless Steel Hardware
- Mounted Standard Yoke for Accessories

VALTORC CV-500 CONTROL VALVE

DESCRIPTION

The rugged VALTORC CV-500 (single seat bronze body) valve is primarily used for steam and water modulating applications. It has greater pressure drop capabilities than all other VALTORC bronze body valves. The equal percent plug provides excellent control characteristics and is more tolerant of oversizing than linear or quick-opening plugs. The standard hardened 17-4 stainless trim provides long life and is recommended for all applications over 50 PSI. The CV-500's control close-off and wear characteristics are particularly well-suited to industrial applications.

DIMENSIONAL INFORMATION (For other sizes consult factory)

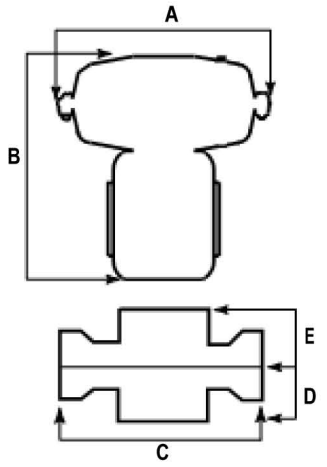
Pneumatic Diaphragm Actuators

Actuator*	A	B	lbs.
46″	10″	10-3/8″	14

Valve Body

Size	C	D	E	lbs.
1/2	2-13/18″	1-11/16″	2-1/2″	2.5
3/4 & 1	3-7/8″	2-3/4″	2-7/8″	5
1-1/4	5-1/16″	3-7/8″	3-13/16″	10
1-1/2	5-1/16″	3-7/8″	3-13/16″	10.5
2	6-3/16″	3-1/4″	3-7/8″	15.5

PNEUMATIC DIAPHRAGM ACTUATOR



VALVE BODY

APPLICATION

To properly size a valve either follow these criteria or use the VALTORC CV-500 valve sizing program available at www.VALTORC.com.

- **Body Material and Rating.** Bronze ANSI Class 250 Body with screwed NPTends, 1/2″ through 2″. Refer to Body Temperature/ Pressure Ratings table to insure your application fits in the acceptable operating range. Also determine that the valve body material is compatible with your media.
- **Trim Material.** Hardened 17-4 stainless steel with replaceable seat.
- **Flowing Pressure Drop (ΔP).** To avoid cavitation and its accompanying trim damage, the following operating ΔP limits should be observed.

BODY TEMPERATURE/PRESSURE RATINGS

ANSI Standard Ratings—Bronze Bodies

Temperature (°F)	Class 250 Lb. (psig)
-20 to 150	400
200	385
250	365
300	335
350	300
400	250

- **Liquid Service.** ΔP less than the quantity (0.66 x inlet pressure) + 10. Additionally, flowing ΔP should not exceed 100 PSI.
- **Steam Service.** ΔP less than the quantity (0.5 x inlet pressure) + 7.35. Additionally, flowing ΔP should not exceed 100 PSI.

CV-500 CLOSE OFF ΔP AND CV RATINGS

				Maximum ΔP in PSI at Close Off					
				Fail Closed			Fail Open		
			Actuator Codes	Signal to Actuator			Signal to Actuator		
Valve Size	CV Rating	Plug Travel	Pneumatic Actuator	Pneumatic 3-15 PSI	1-17 PSI	0-30 PSI	Pneumatic 3-15 PSI	1-17 PSI	0-30 PSI
1/2	2.7	3/4	46 / 4C	200	200	200	200	200	200
			4X	-	200	200	-	200	200
3/4	6	3/4	46 / 4C	137	200	200	137	200	200
			4X	-	78	200	-	200	200
1	10	3/4	46 / 4C	57	200	200	57	200	200
			4X	-	24	200	-	152	200
1-1/4	16	1	46 / 4C	-	68	200	53	192	200
			4X	-	-	200	-	-	200
1-1/2	20	1	46 / 4C	-	37	135	27	124	200
			4X	-	-	200	-	-	200
2	38	1	46 / 4C	-	11	66	5	60	200
			4X	-	-	127	-	-	135

NOTES: 1) A 200 PSI ΔP limit is imposed for trim life considerations.
2) Closeoff pressures can be substantially increased on the 46″ diaphragm actuators by sacrificing full stroke capability for cases where total valve capacity is not required. There is no way to publish formulas for all possible combinations. A rule of thumb is that, generally, closeoff pressures listed in the 0-30 PSI column are possible with a 3-15 PSI control signal by adjusting preload to compromise full stroke.

SIZING REFERENCE

STEAM TABLE

Steam Pressure PSIG	Temp. °F	Temp. °C	Sensible Heat BTU/lb.	Latent Heat BTU/lb.	Total Heat BTU/lb.
0	212	100	180	971	1151
10	239	115	207	952	1159
25	266	130	236	934	1170
50	297	147	267	912	1179
75	320	160	290	896	1186
100	338	170	309	881	1190
125	353	178	325	868	1193
150	365	185	339	858	1197
200	387	197	362	838	1200
250	406	208	381	821	1202
300	422	217	399	805	1204
400	448	231	438	778	1216
500	470	243	453	752	1205
600	489	254	475	729	1204

RECTANGULAR TANK CAPACITY IN GALLONS

$$\text{Gallons} = \frac{\text{Height x Width x Length (inches)}}{230}$$

or

$$\text{Gallons} = H \times W \times L(\text{ft.}) \times 7.5$$

CIRCULAR TANK STORAGE CAPACITY IN GALLONS

Storage = 6D2 x L (Gallons)

Where: D = tank diameter in Feet

L = length in Feet

LOAD SIZING CALCULATIONS

Heating Water with Steam

Quick Method

$$\text{Lbs./hr.} = \frac{\text{GPM}}{2} \times \Delta T$$

Precise Method

$$\text{Lbs./hr.} = \frac{\text{GPM} \times 500 \times \Delta T}{hf_g}$$

Heating or Cooling Water with Water

$$\text{GPM1} = \text{GPM2} \times \frac{\text{°F water2 temp rise or drop}}{\text{°F water1 temp rise or drop}}$$

Heating or Cooling Water

$$\text{GPM} = \frac{\text{BTU/hr.}}{(\text{°F water temp. rise or drop}) \times 500}$$

Heating Oil with Steam

$$\text{Lbs./hr.} = \frac{\text{GPM}}{4} \times (\text{°F oil temp. rise})$$

Heating Air with Water

$$\text{GPM} = 2.16 \times \frac{\text{CFM x (°F air temp. rise)}}{1000 \times (\text{°F water temp drop or rise})}$$

Heating Liquids with Steam

$$\text{Lbs./hr.} = \frac{\text{GPM} \times 60 \times CP \times W}{hf_g} \times \Delta T$$

Heating Liquids in Steam Jacketed Kettles

$$\text{Lbs./hr.} = \frac{\text{GPM} \times Cp \times S \times 8.33}{hf_{g \times t}} \times \Delta T$$

General Liquid Heating

$$\text{Lbs./hr.} = \frac{W \times Cp}{hf_{g \times t}} \times \Delta T$$

Heating Air with Steam

$$\text{Lbs./hr.} = \frac{\text{CFM}}{900} \times \Delta T$$

GLOSSARY OF TERMS

t = Time in Hours
Cp = Specific Heat of Liquid
S = Specific Gravity of Fluid
W = Weight in Lbs.
ΔT = Temperature rise of fall in °F
hfg = Latent Heat of Steam

CONVERSION FACTORS

1 lb. Steam/Hr. =	1000 BTU/Hr.
1 Cubic Meter =	265 U.S. Gallons
1 Cubic Foot Water =	62.4 lbs.
1 PSI =	2.04 inches of Mercury
1 PSI =	2.3 feet of Water
1 PSI =	27.7 inches of Water
1 U.S. Gallon Water =	231 Cubic inches
1 U.S. Gallon Water =	8.33 lbs.