



# SERIES 2000 TEMPERATURE REGULATOR

SIZES 1/2" – 2"  
CONTROLS -25 to 400°F

## SERIES 2000 TEMPERATURE REGULATOR

### APPLICATION DATA

#### DIRECT ACTING

- Bottle Washing Machinery
- Steam Tables
- Plating Tanks
- Heating Ducts
- Fuel Oil Heaters
- Cooking Vats
- Water Heaters
- Heat Exchangers
- Parts Washer

#### THREE-WAY MIXING

- Fire Tube Boiler
- Internal Combustion Engine

#### REVERSE ACTING

- Induction Furnaces
- Industrial Compressors
- Cold Storage Boxes
- Cooling Ducts
- Engine Jacket Cooling
- Liquid Chillers

#### GAS SERVICE

- Oil Treaters
- Line Heaters
- Separators
- Glycol Dehydrators
- Storage Tanks

### VALVE RATINGS

Valve Ends ASME/ANSI	Pressure PSIG (bar)	Temperature °F (°C)
Class 250 NPT	250 (17.2)	400 (204)

Canadian Registration # OC 0591.9C

- Self-actuated
- Two and Three Way Valve Bodies
- Single or Double Seat
- Overtemperature Protection
- Spring Loaded Teflon Chevron Type Packing Assembly
- Double Guided Stainless Steel Monolithic Disc Assembly
- Stainless Steel Seat Rings and Disc
- Adjusting Key Attached
- Galvanized Iron Union Ends
- Full Ported and Full Flow Bronze Body
- Copper Bulb with 8' Armored Capillary

### MODELS

- Type 2010 — Single Seat, Direct Acting
- Type 2020 — Single Seat, Reverse Acting
- Type 2030 — Double Seat, Direct Acting
- Type 2040 — Double Seat, Reverse Acting
- Type 2050 — Three-way Mixing and Diverting
- Type 2060 — Gas Service-15 psig maximum. If pressure exceeds 15 psi, a pressure reducing regulator should be used ahead of the temperature regulator.

### OPTIONS

- Dial Temperature Gage (Indicating)
- Stainless Steel Bulb
- Stainless Steel Armored Capillary
- Capillary lengths greater than 8'
- Extra Large Bulb
- Union Bushings & Wells

# SERIES 2000 TEMPERATURE REGULATOR

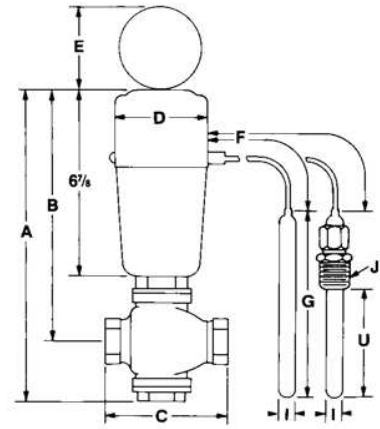
## SPECIFICATION

The valve shall be self-operated, requiring no external energy source. It shall have single or double stainless steel seats with double guided monolithic disc assembly for proper alignment. The valve shall be direct acting (heating) or reverse acting (cooling) and have two way or three way operation. The packing assembly shall be spring loaded, self adjusting with chevron type teflon packing. The thermal system line and bulb assembly shall be partially filled with a liquid/gas combination and in a range selected for fast response. The valve rating shall be 250 PSIG at 400°F. Body materials shall be bronze.

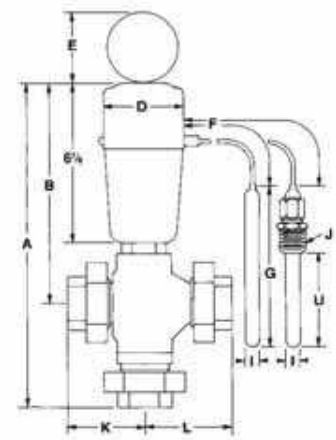
**MODEL 2060 FOR GAS SERVICE ONLY:** The valve shall be self-operated, requiring no external energy source and designed to control process temperature by regulating gas flow. It shall be normally open and close with increased temperature. "Bubble tight" dead end shutoff shall be provided by Buna-N vulcanized to disc backing. The packing assembly shall be spring loaded, self adjusting with chevron type teflon packing. The thermal system line and bulb assembly shall be partially filled with a liquid/gas combination and in a range selected for fast response. The valve rating shall be 15 PSIG. Body materials shall be nodular iron.

## MATERIALS OF CONSTRUCTION

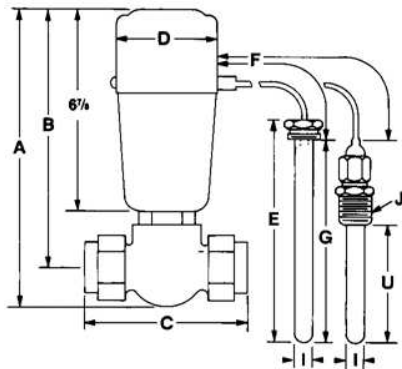
ITEM	TYPE 2010-2050	TYPE 2060
Body	Bronze ASTM B62 C83600	Ductile Iron ASTM A536 65-45-12
Trim	Stainless Steel	Buna-N
Packing	Teflon	Buna-N
Unions	Iron	Iron
Yoke	Steel	Steel
Cap	Aluminum	Aluminum
Bellows	Bronze	Bronze
Spring	Steel	Steel
Capillary	Copper	Copper
Bulb	Copper	Copper
Armor	Bronze	—
Stem	304 Stainless Steel	304 Stainless Steel
Disc	304 Stainless Steel	Buna-N
Seat	303 Stainless Steel	—



**TYPE 2010-2040 DIRECT & REVERSE ACTING**



**TYPE 2050 THREE WAY**



**TYPE 2060 GAS SERVICE**

### TYPE 2060 GAS SERVICE DIMENSIONS inches (mm) AND WEIGHTS pounds (kg)

Size	Dimensions					Shipping Weight (Approx.)
	A	B	C	D	F†	
1/2" 3/4" 1"	9 3/4 (248)	8 1/2 (216)	5 5/8 (143)	3 1/2 (89)	10 Ft. (3 m.)	8 (3.6)

### TYPE 2010-2040 DIRECT & REVERSE ACTING DIMENSIONS inches (mm) AND WEIGHTS pounds (kg)

Size	Type No.	Dimensions						Shipping Weight (Approx.)
		A	B	C	D	E	F†	
1/2" (A, B, C, D, E) 1/2, 3/4"	2010	9 3/4 (248)	8 1/2 (216)	5 1/2 (140)	3 1/2 (89)	2 13/16 (71)	8 Ft.	10 (4.5)
	2020							
3/4"	2030	12 7/16 (316)	9 3/4 (248)	7 3/16 (182)	3 1/2 (89)	2 13/16 (71)	8 Ft.	13 (5.9)
	2040							
1"	2010	12 7/16 (316)	9 3/4 (248)	7 3/16 (182)	3 1/2 (89)	2 13/16 (71)	8 Ft.	13 (5.9)
	2020							
1 1/4" 1 1/2" 2"	2030	12 7/8 (327)	9 31/32 (253)	8 15/16 (227)	3 1/2 (89)	2 13/16 (71)	8 Ft.	20 (9.1) 25 (11) 30 (14)
	2040							

### TYPE 2050 THREE WAY DIMENSIONS inches (mm) AND WEIGHTS pounds (kg)

Size	Dimensions						Shipping Weight (Approx.)
	A	B	D	F†	K	L	
1/2" 3/4" 1"	13 7/8 (352)	9 3/4 (248)	3 1/2 (89)	8 Ft.	3 5/16 (84)	3 5/8 (92)	2 13/16 (71)
	14 21/32 (372)	9 31/32 (253)	3 1/2 (89)	8 Ft.	4 1/8 (105)	4 11/16 (119)	
	14 7/8 (378)	9 31/32 (253)	3 1/2 (89)	8 Ft.	4 3/16 (106)	4 7/8 (124)	

F† See following pages for standard lengths, ranges, bulb sizes and maximum line lengths.

# SERIES 2000 TEMPERATURE REGULATOR SELECTION

## DIRECT & REVERSE ACTING & THREE WAY FLOW AND PRESSURE RATINGS psig (bar)

Size	Single Seat				Double Seat				Three Way		
	Type Number		Flow Coefficient C <sub>v</sub>	Max. Upstream Pressure	Type Number		Flow Coefficient C <sub>v</sub>	Max. Upstream Pressure	Type Number	Flow Coefficient C <sub>v</sub>	Max. Difference Between Inlet Pressures*
	Direct	Reverse			Direct	Reverse					
1/2"C	2010	2020	.40	250 (17.2)	NOT AVAILABLE IN DOUBLE SEAT				NOT AVAILABLE IN THREE WAY		
1/2"D			1.00								
1/2"E			1.80								
1/2"A			3.29								
1/2"B			4.29	200 (13.8)							
1/2"T			5.22	140 (9.7)	2030	2040	250 (17.2)	2050	5.22	140 (9.7)	
3/4"T			6.85	90 (6.2)					6.85	90 (6.2)	
1"T			9.15	65 (4.5)					9.15	65 (4.5)	
1 1/4"T	14.3	40 (2.8)	14.3	40 (2.8)							
1 1/2"T	15.1	30 (2.1)	15.1	30 (2.1)							
2"T	17.2	20 (1.4)	17.2	20 (1.4)							

SIZING INFO  
PAGE 91

### How to Select Range & Bulb Size

- Select a temperature range with the control point in the upper half of the temperature range.
- Determine line length required (8' is standard).
- Use line length and temperature range to find correct bulb size in chart at right.

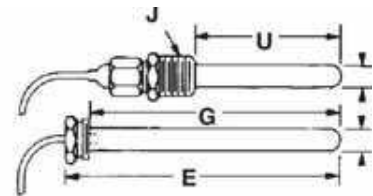
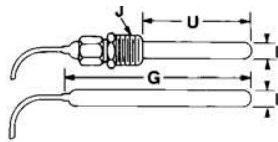
EXAMPLE:  
Control point: 130°F.  
Temperature range: 65/140°F.  
Line length: 15'

SOLUTION:  
Bulb size: extra large – G = 15 5/8"

### RANGES, BULB SIZES & MAXIMUM LINE LENGTHS

Short Ranges (Gold Spring)		Long Ranges (Silver Spring)		Bulb Size	†Max. Line Length	Maximum Over-Temperature	
°F	°C	°F	°C			°F	°C
45 to 115	7.2 to 46	45 to 145	7.2 to 63	X Large	40 Ft.	450	232
65 to 140	18 to 60	65 to 170	18 to 77	X Large	40 Ft.	450	232
120 to 200	49 to 93	120 to 230	49 to 110	Small	40 Ft.	300	149
240 to 310	116 to 154	240 to 340	116 to 171	Small	40 Ft.	350	177
280 to 375	138 to 190	280 to 415	138 to 212	Small	40 Ft.	450	232

†Standard line lengths are 25' and 40'.



### BULB DIMENSIONS\* inches (mm)

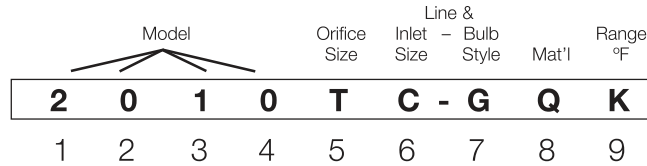
Bulb Sizes	G			U	I			J (NPT)
	Copper	Stain. Stl.	Coated		Plain	Union	Well	
Small	13 3/8 (340)	13 1/4 (337)	11 3/8 (289)	10 1/2 (267)	5/8 (16)	5/8 (16)	3/4 (19)	3/4 or 1
Large	15 5/8 (397)	15 1/8 (384)	13 1/4 (337)	12 1/2 (317)	1 (25)	1 (25)	1 1/8 (29)	1
Extra Large	19 (483)	18 5/8 (473)	19 (483)	16 (406)	1 (25)	1 (25)	1 1/8 (29)	1

### GAS SERVICE BULB & WELL DIMENSIONS inches (mm)

E	G	I		U	J (NPT)
		Bulb	Well		
8 1/4 (210)	7 3/8 (187)	25/32 (20)	15/16 (24)	7 11/16 (195)	1

# SERIES 2000 TEMPERATURE REGULATOR

## CODE SELECTION CHART



**Model -**  
 Position 1, 2, 3 & 4  
 2010 = Single Seat, Direct Acting  
 2020 = Single Seat, Reverse Acting  
 2030 = Double Seat, Direct Acting  
 2040 = Double Seat, Reverse Acting  
 2050 = Three Way

**Orifice -**  
 Position 5  
 A  
 B  
 C  
 D  
 E  
 T = Standard

**Inlet Size -**  
 Position 6  
 C = 1/2  
 D = 3/4  
 E = 1  
 F = 1 1/4  
 G = 1 1/2  
 H = 2

**Line & Bulb Style -**  
 Position 7  
 G = Indicating  
 N = Non-indicating

**Material† -**  
 Position 8  
 Q = Copper Bz Armor 8'  
 R = Copper Bz Armor 15'  
 N = Copper Bz Armor 25'  
 P = Copper Bz Armor 40'  
 T = SS Unarmored 8'  
 V = SS Unarmored 15'  
 W = SS Unarmored 25'  
 X = SS Unarmored 40'  
 Z = Other

**Range °F -**  
 Position 9  
 C = 45/115  
 D = 45/145  
 E = 65/140  
 F = 65/170  
 J = 120/200  
 K = 120/230  
 L = 240/310  
 M = 240/340  
 N = 280/375  
 P = 280/415  
 Z = Other

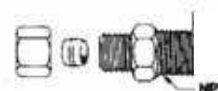
† For SS Armored Thermal Assembly Material, add (-TV) at the end of the code (ex.: 2010TC-NTH-TV)  
 † Small bulb standard for J-1 range and higher.  
 Extra large bulb standard for D range and lower.  
 Large bulb standard for E and F range

SERIES 2000 TEMP. REGULATOR

**THERMOWELL**



**UNION BUSHINGS**



**WELLS**

Cat. No.	Bulb Size	Material	Inches (mm)			
			Bulb Dia.	NPT	U	Well Dia.
99A	S	Brass	5/8 (16)	3/4 (19)	10 1/2 (267)	3/4 (19)
99B	S	Brass		1 (25)		
99G	S	316 St. St.		3/4 (19)		
99H	S	316 St. St.		1 (25)		
99J	L	Brass	1 (25)	1 (25)	12 1/2 (318)	1 1/8 (29)
99K	X	Brass			16 (406)	
99Q	L	316 St. St.			12 1/2 (318)	
99R	X	316 St. St.			16 (406)	

**UNION BUSHINGS**

Cat. No.	Bulb Size	Material	Inches (mm)	
			Bulb Dia.	NPT
98A	S	Brass	5/8 (16)	3/4
98B	S	Brass		1
98C	S	St. St.		3/4
98D	S	St. St.		1
98E	L & X	Brass	1 (25)	1
98F	L & X	St. St.	1 (25)	1

Thermowells and union bushings are utilized as separate items and should be specified on separate lines.

# RATED STEAM CAPACITY TABLE

## SERIES 2000 TEMPERATURE REGULATOR

SERIES 2000  
CAPACITY TABLE

VALVE SIZE		SINGLE SEATED VALVES										DOUBLE SEATED VALVES							
Inlet Pressure PSIG	Outlet Pressure PSIG	½C	½D	½E	½A	½B	¾	1	1¼	1½	2	½	¾	1	1¼	1½	2		
<b>DRY SATURATED STEAM - LBS. OF STEAM/HR</b>																			
<b>5</b>	UP to 9" HG.VAC. 6" HG.VAC. 2	12 11 8	30 29 21	53 52 38	97 95 70	130 125 90	155 150 110	200 195 145	270 265 195	420 415 305	450 440 320	510 500 365	235 230 170	305 300 220	380 375 275	610 600 440	735 720 525	975 960 700	
	<b>10</b>	UP to 3" HG.VAC. 3 7	15 13 10	35 33 24	65 60 44	120 110 80	160 145 105	195 175 125	255 230 165	340 305 220	530 480 345	565 510 370	635 575 415	295 265 190	385 345 250	480 430 310	765 690 500	920 830 600	1220 1100 800
		<b>20</b>	UP to 4 10 15	21 19 15	52 47 37	95 85 66	170 155 120	225 200 155	270 245 190	355 325 250	475 430 335	745 675 525	790 715 555	895 810 630	415 375 290	540 490 380	670 610 470	1070 970 755	1290 1170 910
<b>30</b>			UP to 10 15 25	27 25 17	67 63 42	120 115 75	220 210 140	290 270 180	350 330 220	460 435 290	615 580 385	960 905 605	1020 960 640		530 500 335	695 660 440	865 815 545	1380 1300 870	1660 1570 1050
	<b>40</b>		UP to 15 20 30	33 32 25	82 79 63	150 140 115	270 260 210	350 340 270	430 415 330	560 540 435	750 725 580	1170 1130 905			650 625 505	885 820 660	1060 1020 820	1690 1630 1300	2030 1960 1570
		<b>50</b>	UP to 20 30 40	39 36 28	97 90 70	175 160 125	320 295 230	415 385 300	505 470 365	665 615 480	890 820 640				770 710 555	1010 935 730	1250 1150 905	2000 1850 1440	2400 2220 1740
<b>60</b>			UP to 25 30 50	45 44 30	112 110 75	200 198 135	370 360 250	480 470 325	585 575 400	770 755 525	1020 1000 700				890 870 605	1160 1140 795	1440 1410 985	2310 2260 1570	2780 2720 1890
	<b>70</b>		UP to 30 40 60	51 49 33	127 122 82	230 220 150	420 400 270	545 520 350	665 635 430	870 830 560					1010 965 650	1320 1260 855	1640 1570 1060	2610 2500 1690	3150 3010 2030
		<b>80</b>	UP to 35 50 70	57 53 35	140 130 85	255 240 155	465 435 285	610 565 375	740 690 455	975 905 600					1120 1050 690	1470 1370 910	1830 1705 1120	2920 2720 1800	3520 3280 2160
<b>90</b>			UP to 41 60 90	65 57 35	155 140 90	285 255 165	515 465 305	675 610 395	820 740 480	1070 975 630					1240 1120 730	1630 1470 960	2020 1830 1190	3230 2790 1900	3890 3520 2290
	<b>100</b>		UP to 46 60 90	70 65 40	170 165 95	310 295 175	565 540 320	740 705 415	900 855 505						1360 1300 770	1790 1700 1010	2220 2110 1250	3540 3380 2000	4260 4060 2400
		<b>110</b>	UP to 52 70 90	75 70 55	185 175 135	335 315 245	615 575 450	800 750 590	975 910 715						1480 1380 1090	1940 1810 1430	2410 2250 1770	3850 3590 2830	4640 4330 3400
<b>120</b>			UP to 57 80 100	80 75 55	200 185 145	365 330 260	665 605 475	865 790 615	1050 965 750						1600 1460 1140	2100 1920 1490	2600 2380 1850	4160 3800 2960	5010 4580 3560
	<b>130</b>		UP to 62 80 110	85 80 60	215 205 150	390 370 270	715 680 495	930 885 645	1130 1080 780						1720 1630 1190	2250 2140 1560	2800 2660 1930	4470 4250 3080	5380 5120 3710
		<b>140</b>	UP to 68 90 120	95 85 60	230 215 155	420 390 280	765 715 510	995 930 670	1215 1130 815						1840 1720 1230	2410 2250 1620	2990 2800 2010	4780 4470 3210	5750 5380 3860
<b>150</b>			UP to 72 90 120	100 95 75	245 240 190	445 430 345	815 780 625	1060 1020 820							1960 1880 1510	2570 2470 1980	3180 3080 2480	5090 4900 3830	6120 5730 4730
	<b>160</b>		UP to 78 100 140	105 100 65	260 250 165	470 450 300	860 820 550	1120 1070 715							2080 1970 1320	2720 2590 1730	3380 3210 2150	5400 5120 3440	6500 6170 4140
		<b>170</b>	UP to 83 100 140	110 105 80	275 270 205	500 485 370	810 885 670	1190 1150 875							2190 2130 1620	2880 2790 2120	3570 3470 2630	5700 5540 4210	6870 6660 5070
<b>180</b>			UP to 89 120 160	115 110 70	290 270 175	525 485 320	960 890 585	1250 1150 760							2310 2140 1400	3030 2800 1840	3760 3480 2290	6010 5550 3650	7240 6690 4400
	<b>190</b>		UP to 95 120 160	125 115 85	305 290 215	555 525 390	1010 960 715	1310 1250 930							2430 2310 1720	3190 3030 2260	3960 3760 2800	6320 6000 4470	7610 7220 5380
		<b>200</b>	UP to 100 120 180	130 125 75	320 310 185	580 560 335	1060 1020 615	1380 1330 805							2550 2470 1480	3350 3240 1940	4150 4010 2410	6630 6410 3850	7980 7720 4640
<b>210</b>			UP to 105 120 180	135 130 90	335 330 230	605 595 415	1110 1080 755								2670 2620 1820	3500 3430 2380	4350 4260 2960	6940 6800 4720	8360 8190 5680
	<b>220</b>		UP to 110 140 200	140 135 80	350 335 195	635 600 355	1160 1100 645								2790 2640 1560	3660 3470 2040	4540 4300 2530	7250 6870 4050	8730 8270 4870
		<b>230</b>	UP to 115 140 200	145 140 95	365 355 240	660 635 435	1210 1160 790								2910 2800 1910	3810 3680 2500	4730 4560 3100	7560 7290 4960	9100 8780 5970
<b>240</b>			UP to 120 160 200	155 140 110	380 355 280	690 640 500	1250 1160 915								3030 2810 2200	3970 3690 2890	4930 4570 3580	7870 7300 5720	9470 8790 6890
	<b>250</b>		UP to 126 160 220	160 150 100	395 375 250	715 675 455	1300 1240 830								3150 2980 1990	4130 3910 2620	5120 4850 3240	8180 7750 5180	9840 9330 6240



# SIZING SERIES 2000 TEMPERATURE REGULATORS

## PERFORMANCE VARIABLE

### EXAMPLE FOR HEATING SERVICE

The maximum anticipated flow requirements for a regulator on heating service is 500 lbs. of steam per hour. The unit steam pressure is 50 psig and the downstream pressure is essentially zero because the steam downstream is discharged into an open drain.

ANSWER: Locate 50 psi on the inlet pressure scale on the left side of the Series 2000 Capacity Chart. Choose the outlet pressure line "up to 20" psig because the downstream pressure is essentially zero. Follow the "up to 20" outlet pressure line until you come to the value closest to 500 lbs. of steam per hour (in this case, 505). Read upward to the valve size and we see that the 1/2" single seated valve is the correct size. To size for three-way valves, use single seated capacities 1/2" through 2" size.

#### NOTE: FORMULAS FOR EXACT CALCULATIONS.

If the outlet pressure is equal to or less than 53% of the absolute inlet pressure:

$$Q (\text{lbs steam/hr}) = 1.5 \times C_v \times \text{inlet pressure (psia)}$$

If the outlet pressure is greater than 53% of the absolute inlet pressure:

$$Q (\text{lbs steam/hr}) = 3 \times C_v \times \sqrt{\text{pressure drop (psi)} \times \text{outlet pressure (psia)}}$$

**30°F span from fully open to fully closed**  
Oversized valve can provide narrower spans—Consult Factory

CAPACITY CHART SEE PAGE 90

## STEAM FLOW REQUIREMENTS

Temp. Rise °F	GALLONS OF WATER HEATED PER HOUR										
	25	50	75	100	150	200	300	400	500	750	1000
	LBS. OF STEAM PER HOUR										
10	2	4	6	8	12	17	25	33	42	63	83
20	4	8	12	17	25	33	50	67	83	120	167
30	6	12	19	25	37	50	70	100	120	190	250
40	9	17	25	33	50	66	100	130	170	250	330
50	11	21	31	42	63	84	125	170	210	310	420
60	13	25	37	50	75	100	150	200	250	370	500
80	17	33	50	67	100	130	200	270	330	500	670
100	21	42	63	83	120	170	250	330	420	630	830
120	25	50	75	100	150	200	300	400	500	750	1000
140	29	58	88	117	175	230	350	470	580	880	1170
160	33	66	100	133	200	270	400	530	660	1000	1330

### STEAM FLOW REQUIREMENTS

Use the top chart on this page to determine the pounds of steam per hour required to raise the temperature in tank of known capacity to the required temperature. Determine the rise in temperature (control temp. - room temp.) on the left hand column, read the corresponding pounds of steam per hour under the corresponding gallons of water to be heated. Use the lbs. steam/hr. figure in the chart on the opposite page to determine valve size.

**Formula for converting the length, width and depth of solutions (all measured in feet) to gallons of solution: Gallons=7.48 x length x width x depth.**

### EXAMPLE FOR COOLING SERVICE

Find the correct regulator valve size that will feed a compressor intercooler that requires 100 gallons of water per minute under maximum operating conditions. The supply (inlet) pressure (P1) is 60 psi and the downstream pressure (P2) under maximum flow conditions is 20 psi. The 20 psi pressure is required to force the full flow of water through the compressor's cooling system. Inlet pressure must not exceed maximum upstream pressure, per the Series 2000 Temperature Regulator Product Pages.

ANSWER: The pressure drop permitted across the regulator is P1 minus P2 (40 psi). In the Water Capacity Table (right), locate 40 psi in the differential pressure column and read across to the required gallons per minute. Read to the highest value (in this case, 130 GPM). The chart indicates that a 1 1/4" double seated valve is required. To size 3-way valve, use single seated capacities 1/2" through 2" size.

## RATED WATER CAPACITY TABLE

PSIG	SINGLE SEATED VALVES						DOUBLE SEATED VALVES					
	1/2	3/4	1	1 1/4	1 1/2	2	1/2	3/4	1	1 1/4	1 1/2	2
Diff. Press.	WATER FLOW—U.S. GALLONS PER MINUTE											
5	12	15	20	32	34	38	18	23	29	46	55	74
10	17	22	29	45	48	54	25	33	41	65	78	104
15	20	27	35	55	59	67	31	40	50	80	96	128
20	23	31	41	64	68	77	35	47	58	92	111	148
25	26	34	46	72	76	86	40	52	65	103	124	165
30	29	38	50	78	83		43	57	71	113	136	181
40	33	43	58	90			50	66	82	130	157	209
50	37	48	65				56	74	91	146	175	233
60	40	53	71				61	81	100	160	192	256
70	44	57					66	87	108	172	207	276
80	47	61					71	93	115	184	222	295
90	50	65					75	99	122	195	235	313
100	52						79	104	129	206	248	330
110	55						83	109	135	216	260	346
120	57						87	114	141	226	272	361
130	60						90	119	147	235	283	376
140	62						94	123	153	244	293	390
150							97	127	158	252	304	404
160							100	132	163	261	314	417
170							103	136	168	269	323	430
180							106	140	173	276	333	443
190							109	143	178	284	342	455
200							112	147	182	291	351	467
210							115	151	187	299	359	478
220							118	154	191	306	368	489
230							120	158	196	312	376	500
240							123	161	200	319	384	511
250							125	164	204	326	392	522