

# 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

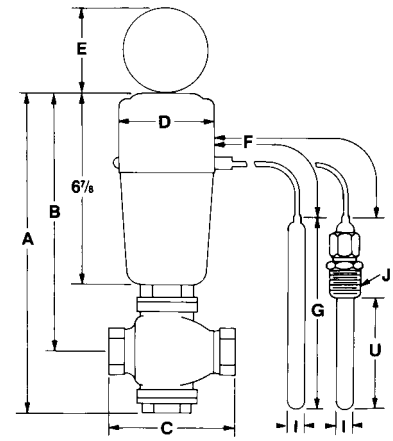
# SERIES 2000 TEMPERATURE REGULATOR SPECIFICATION

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.

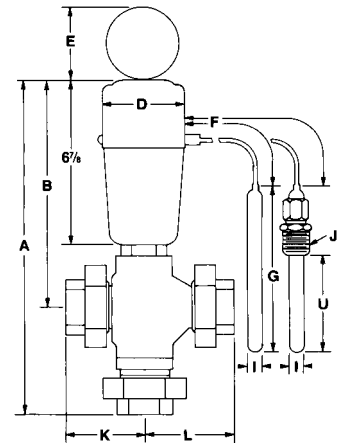
**MODEL 2060 FOR GAS SERVICE ONLY:** The valve shall be self-operated, requiring no external energy source and designed to control process temperature by regulating gas flow. It shall be normally open and close with increased temperature. "Bubble tight" dead end shutoff shall be provided by Buna-N vulcanized 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

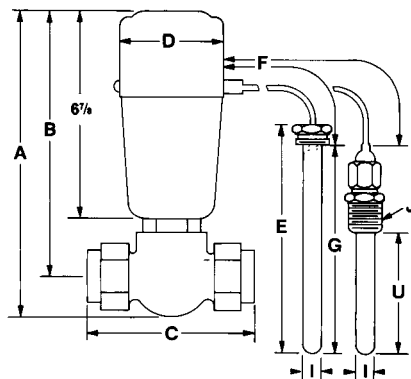
ITEM	TYPE 2010-2050	TYPE 2060
Body	Bronze ASTM B62 C83600	Ductile Iron ASTM A536 65-45-12
Trim	Stainless Steel	Buna-N
Packing	Teflon	Buna-N
Unions	Iron	Iron
Yoke	Steel	Steel
Cap	Aluminum	Aluminum
Bellows	Bronze	Bronze
Spring	Steel	Steel
Capillary	Copper	Copper
Bulb	Copper	Copper
Armor	Bronze	—
Stem	304 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 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							
1/2" 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)
	2040							25 (11)
								30 (14)

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

Size	Dimensions						Shipping Weight (Approx.)
	A	B	D	F†	K	L	
1/2"	13 7/8 (352)	9 3/4 (248)	3 1/2 (89)	8 Ft.	3 5/16 (84)	3 5/8 (92)	12 (5.5)
3/4"							12 (5.5)
1"							13 (5.9)
1 1/4" 1 1/2"	14 21/32 (372)	9 31/32 (253)	3 1/2 (89)	8 Ft.	4 1/8 (105)	4 11/16 (119)	27 (12)
2"	14 7/8 (378)	9 31/32 (253)	3 1/2 (89)	8 Ft.	4 3/16 (106)	4 7/8 (124)	33 (15)

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

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

† 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)	2030      2040				2050																	
1/2"T			5.22	140 (9.7)								250 (17.2)	2050	7.93	5.22	140 (9.7)										
3/4"T			6.85	90 (6.2)													10.4	6.85	90 (6.2)							
1"T			9.15	65 (4.5)																12.9	9.15	65 (4.5)				
1 1/4"T			14.3	40 (2.8)																			20.6	14.3	40 (2.8)	
1 1/2"T			15.1	30 (2.1)																						24.8
2"T	17.2	20 (1.4)	33.0	17.2																						

**SIZING INFO**

### 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: 45/145°F.  
 Line length: 15'

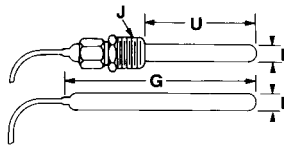
**SOLUTION:**

Bulb size: extra large – G = 19"

### RANGES, BULB SIZES & MAXIMUM LINE LENGTHS

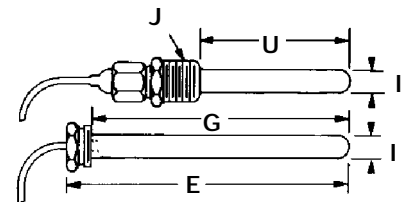
Short Ranges (Gold Spring)		Long Ranges (Silver Spring)		Bulb Size	†Max. Line Length	Maximum Over-Temperature	
°F	°C	°F	°C			°F	°C
-15 to 50	-26 to 10	-15 to 75	-26 to 24	Large X Large	15 Ft. 40 Ft.	450	232
45 to 115	7.2 to 46	45 to 145	7.2 to 63	Large X Large	10 Ft. 40 Ft.	450	232
65 to 140	18 to 60	65 to 170	18 to 77	Large X Large	20 Ft. 40 Ft.	450	232
90 to 165	32 to 74	90 to 195	32 to 91	Large X Large	20 Ft. 40 Ft.	300	149
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

## HOW TO ORDER

BODY ASSEMBLY			THERMAL ASSEMBLY <sup>††</sup>			
2010	T	C	-	G	Q	K
XXXX	X	X	-	X	X	X
TYPE NO.	ORIFICE	INLET SIZE	-	LINE & BULB STYLE	MATERIAL	RANGE °F
2010–Single Seat, Direct Acting	A	C–1/2		G–Indicating	Q–Copper Bz Armor 8'	A–15/50
2020–Single Seat, Reverse Acting	B	D–3/4		N–Non-indicating	R–Copper Bz Armor 15'	B–15/75
2030–Double Seat, Direct Acting	C	E–1			N–Copper Bz Armor 25'	C–45/115
2040–Double Seat, Reverse Acting	D	F–1-1/4			P–Copper Bz Armor 40'	D–45/145
2050–Three Way	E	G–1-1/2			T–SS Unarmored 8'	E–65/140
	T–Standard	H–2			V–SS Unarmored 15'	F–65/170
					W–SS Unarmored 25'	G–90/165
					X–SS Unarmored 40'	H–90/195
					Z–Other	J–120/200
						K–120/230
						L–240/310
						M–240/340
						N–280/375
						P–280/415
						Z–Other
2060–Gas Regulator	T–Standard	C–1/2		N–Non-indicating	A–Bronze 5'	1–40/90
		D–3/4			B–Bronze 10'	2–45/115
		E–1			C–Bronze 15'	3–65/170
					D–Bronze 20'	4–110/190
					Z–Other	5–110/220
						6–240/340
						7–330/440
						8–65/140

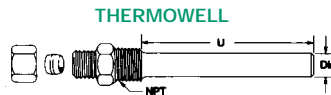
† Large bulb standard for H-90/195 range and lower. Small bulb standard for J-120/200 range and higher.

Extra large bulb may be required for extra line length and are special order.

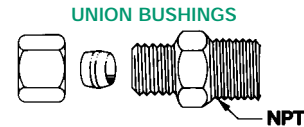
Line lengths are standard 8' and 15'. Other sizes are special order.

Unions and wells are to be entered as separate line items.

††For SS Armored Thermal Assembly Material, add (-TV) at the end of the code (ex.: 2010TC-NTH-TV)



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	1
98F	L & X	St. St.	(25)	1

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