



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

SERIES 2000 TEMPERATURE REGULATOR

SIZES 1/2" – 2"
CONTROLS -25 to 400°F

- 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

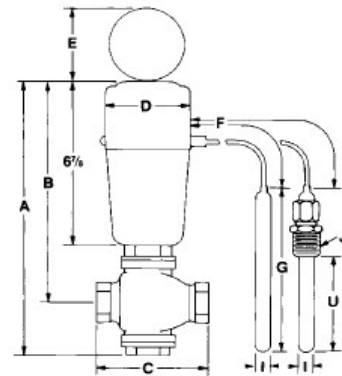
SPECIFICATION

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.

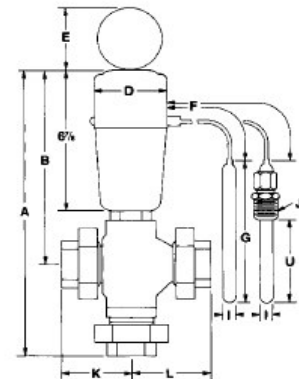
MODEL 2060 FOR GAS SERVICE ONLY: The valve shall be self-operated, requiring no external energy source and designed to control process temperature by regulating gas flow. It shall be normally open and close with increased temperature. "Bubble tight" dead end shutoff shall be provided by Buna-N vulcanized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

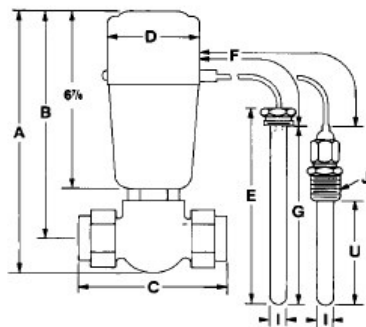
ITEM	TYPE 2010-2050	TYPE 2060
Body	Bronze ASTM B62 C83600	Ductile Iron ASTM A536 65-45-12
Trim	Stainless Steel	Buna-N
Packing	Teflon	Buna-N
Unions	Iron	Iron
Yoke	Steel	Steel
Cap	Aluminum	Aluminum
Bellows	Bronze	Bronze
Spring	Steel	Steel
Capillary	Copper	Copper
Bulb	Copper	Copper
Armor	Bronze	—
Stem	304 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"	9 3/4	8 1/2	5 5/8	3 1/2	10 Ft.	8
3/4"	(248)	(216)	(143)	(89)	(3 m.)	(3.6)
1"						

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

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)	2010	9 3/4	8 1/2	5 1/2	3 1/2	2 13/16	8 Ft.	10
	2020	(248)	(216)	(140)	(89)	(71)		(4.5)
1/2"	2030	12 7/16	9 3/4	7 3/16	3 1/2	2 13/16	8 Ft.	13
3/4"	2040	(316)	(248)	(182)	(89)	(71)		(5.9)
1"	2010	12 7/16	9 3/4	7 3/16	3 1/2	2 13/16	8 Ft.	13
	2020	(316)	(248)	(182)	(89)	(71)		(5.9)
1 1/4"	2030	12 7/8	9 31/32	8 15/16	3 1/2	2 13/16	8 Ft.	20 (9.1)
1 1/2"	2040	(327)	(253)	(227)	(89)	(71)		25 (11)
2"								30 (14)

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

Size	Dimensions							Shipping Weight (Approx.)
	A	B	D	F†	K	L	E	
1/2"	13 7/8	9 3/4	3 1/2	8 Ft.	3 5/16	3 5/8	2 13/16 (71)	12 (5.5)
3/4"	(352)	(248)	(89)		(84)	(92)		12 (5.5)
1"								13 (5.9)
1 1/4"	14 21/32	9 31/32	3 1/2	8 Ft.	4 1/8	4 11/16	2 13/16 (71)	27
1 1/2"	(372)	(253)	(89)		(105)	(119)		(12)
2"	14 7/8	9 31/32	3 1/2	8 Ft.	4 3/16	4 7/8		33
	(378)	(253)	(89)		(106)	(124)		(15)

SERIES 2000 TEMPERATURE REGULATOR SELECTION

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

	Single Seat				Double Seat				Three Way							
Size	Type Number		Flow Coefficient C _v	Max. Upstream Pressure	Type Number		Flow Coefficient C _v	Max. Upstream Pressure	Type Number	Flow Coefficient C _v	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				250 (17.2)	2050	5.22	140 (9.7)				
1/2"T			5.22	140 (9.7)												
3/4"T			6.85	90 (6.2)									10.4			
1"T			9.15	65 (4.5)										12.9		
1 1/4"T			14.3	40 (2.8)											20.6	
1 1/2"T			15.1	30 (2.1)												24.8
2"T			17.2	20 (1.4)												

SIZING INFO
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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'

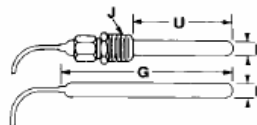
SOLUTION:

Bulb size: extra large – G = 15 5/8"

RANGES, BULB SIZES & MAXIMUM LINE LENGTHS

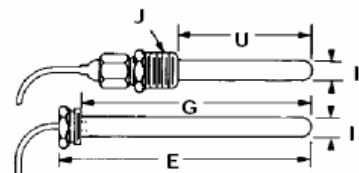
Short Ranges (Gold Spring)		Long Ranges (Silver Spring)		Bulb Size	†Max. Line Length	Maximum Over-Temperature	
°F	°C	°F	°C			°F	°C
-15 to 50	-26 to 10	-15 to 75	-26 to 24	X Large	40 Ft.	450	232
45 to 115	7.2 to 46	45 to 145	7.2 to 63	X Large	40 Ft.	450	232
65 to 140	18 to 60	65 to 170	18 to 77	Large	15 Ft.	450	232
120 to 200	49 to 93	120 to 230	49 to 110	X Large	40 Ft.	450	232
240 to 310	116 to 154	240 to 340	116 to 171	Small	40 Ft.	300	149
280 to 375	138 to 190	280 to 415	138 to 212	Small	40 Ft.	350	177
					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

RATED STEAM CAPACITY TABLE

SERIES 2000 TEMPERATURE REGULATOR

VALVE SIZE		SINGLE SEATED VALVES											DOUBLE SEATED VALVES					
Inlet Pressure PSIG	Outlet Pressure PSIG	½C	½D	½E	½A	½B	½	¾	1	1¼	1½	2	½	¾	1	1¼	1½	2
DRY SATURATED STEAM—LBS. OF STEAM/HR																		
5	UP to 9" HG. VAC. 6" HG. VAC. 2	12	30	53	97	130	155	200	270	420	450	510	235	305	380	610	735	975
		11	29	52	95	125	150	195	265	415	440	500	230	300	375	600	720	960
		8	21	38	70	90	110	145	195	305	320	365	170	220	275	440	525	700
10	UP to 3" HG. VAC. 3 7	15	35	65	120	160	195	255	340	530	565	635	295	385	480	765	920	1220
		13	33	60	110	145	175	230	305	480	510	575	265	345	430	690	830	1100
		10	24	44	80	105	125	165	220	345	370	415	190	250	310	500	600	800
20	UP to 4 10 15	21	52	95	170	225	270	355	475	745	790	895	415	540	670	1070	1290	1720
		19	47	85	155	200	245	325	430	675	715	810	375	490	610	970	1170	1550
		15	37	66	120	155	190	250	335	525	555	630	290	380	470	755	910	1200
30	UP to 10 15 25	27	67	120	220	290	350	460	615	960	1020		530	695	865	1380	1660	2210
		25	63	115	210	270	330	435	580	905	960		500	660	815	1300	1570	2090
		17	42	75	140	180	220	290	385	605	640		335	440	545	870	1050	1390
40	UP to 15 20 30	33	82	150	270	350	430	560	750	1170			650	885	1060	1690	2030	2710
		32	79	140	260	340	415	540	725	1130			625	820	1020	1630	1960	2610
		25	63	115	210	270	330	435	580	905			505	660	820	1300	1570	2090
50	UP to 20 30 40	39	97	175	320	415	505	665	890				770	1010	1250	2000	2400	3200
		36	90	160	295	385	470	615	820				710	935	1150	1850	2220	2960
		28	70	125	230	300	365	480	640				555	730	905	1440	1740	2310
60	UP to 25 30 50	45	112	200	370	480	585	770	1020				890	1160	1440	2310	2780	3700
		44	110	198	360	470	575	755	1000				870	1140	1410	2260	2720	3620
		30	75	135	250	325	400	525	700				605	795	985	1570	1890	2520
70	UP to 30 40 60	51	127	230	420	545	665	870					1010	1320	1640	2610	3150	4190
		49	122	220	400	520	635	830					965	1260	1570	2500	3010	4010
		33	82	150	270	350	430	560					650	855	1060	1690	2030	2700
80	UP to 35 50 70	57	140	255	465	610	740	975					1120	1470	1830	2920	3520	4690
		53	130	240	435	565	690	905					1050	1370	1705	2720	3280	4360
		35	85	155	285	375	455	600					690	910	1120	1800	2160	2880
90	UP to 41 60 90	65	155	285	515	675	820	1070					1240	1630	2020	3230	3890	5180
		57	140	255	465	610	740	975					1120	1470	1830	2790	3520	4680
		35	90	165	305	395	480	630					730	960	1190	1900	2290	3040
100	UP to 46 60 90	70	170	310	565	740	900						1360	1790	2220	3540	4260	5680
		65	165	295	540	705	855						1300	1700	2110	3380	4060	5410
		40	95	175	320	415	505						770	1010	1250	2000	2400	3200
110	UP to 52 70 90	75	185	335	615	800	975						1480	1940	2410	3850	4640	6170
		70	175	315	575	750	910						1380	1810	2250	3590	4330	5760
		55	135	245	450	590	715						1090	1430	1770	2830	3400	4530
120	UP to 57 80 100	80	200	365	665	865	1050						1600	2100	2600	4160	5010	6670
		75	185	330	605	790	965						1460	1920	2380	3800	4580	6090
		55	145	260	475	615	750						1140	1490	1850	2960	3560	4740
130	UP to 62 80 110	85	215	390	715	930	1130						1720	2250	2800	4470	5380	7160
		80	205	370	680	885	1080						1630	2140	2660	4250	5120	6810
		60	150	270	495	645	780						1190	1560	1930	3080	3710	4940
140	UP to 68 90 120	95	230	420	765	995	1215						1840	2410	2990	4780	5750	7660
		85	215	390	715	930	1130						1720	2250	2800	4470	5380	7160
		60	155	280	510	670	815						1230	1620	2010	3210	3860	5140
150	UP to 72 90 120	100	245	445	815	1060							1960	2570	3180	5090	6120	8150
		95	240	430	780	1020							1880	2470	3060	4900	5890	7840
		75	190	345	625	820							1510	1980	2460	3930	4730	6290
160	UP to 78 100 140	105	260	470	860	1120							2080	2720	3380	5400	6500	8650
		100	250	450	820	1070							1970	2590	3210	5120	6170	8210
		65	165	300	550	715							1320	1730	2150	3440	4140	5500
170	UP to 83 100 140	110	275	500	810	1190							2190	2880	3570	5700	6870	9140
		105	270	485	885	1150							2130	2790	3470	5540	6660	8870
		80	205	370	670	875							1620	2120	2630	4210	5070	6740
180	UP to 89 120 160	115	290	525	960	1250							2310	3030	3760	6010	7240	9640
		110	270	485	890	1150							2140	2800	3480	5550	6690	8900
		70	175	320	585	760							1400	1840	2290	3650	4400	5850
190	UP to 95 120 160	125	305	555	1010	1310							2430	3190	3960	6320	7610	10100
		115	290	525	960	1250							2310	3030	3760	6000	7220	9610
		85	215	390	715	930							1720	2260	2800	4470	5380	7160
200	UP to 100 120 180	130	320	580	1060	1380							2550	3350	4150	6630	7980	10600
		125	310	560	1020	1330							2470	3240	4010	6410	7720	10300
		75	185	335	615	805							1480	1940	2410	3850	4640	6180
210	UP to 105 120 180	135	335	605	1110								2670	3500	4350	6940	8360	11100
		130	330	595	1080								2620	3430	4260	6800	8190	10900
		90	230	415	755								1820	2380	2960	4720	5680	7560
220	UP to 110 140 200	140	350	635	1160								2790	3660	4540	7250	8730	11600
		135	335	600	1100								2640	3470	4300	6870	8270	11000
		80	195	355	645								1560	2040	2530	4050	4870	6480
230	UP to 115 140 200	145	365	660	1210								2910	3810	4730	7560	9100	12100
		140	355	635	1160								2800	3680	4560	7290	8780	11700
		95	240	435	790								1910	2500	3100	4960	5970	7940
240	UP to 120 160 200	155	380	690	1250								3030	3970	4930	7870	9470	12600
		140	355	640	1160								2810	3690	4570	7300	8790	11700
		110	280	500	915								2200	2890	3580	5720	6890	9170
250	UP to 126 160 220	160	395	715	1300								3150	4130	5120	8180	9840	13100
		150	375	675	1240								2980	3910	4850	7750	9330	12400
		100	250	455	830								1990	2620	3240	5180	6240	8300