

LV4 Slip Jointed Enclosure

## Specification

**ENCLOSURE:**

- STYLE: Flat Top, Front Outlet  
 OUTLET: Stamped Louvers  
 Pencil Proof  
 LENGTHS: 2'0" thru 8'0" in 6" Increments  
 MAT'L:  16 Ga. CRS (Std)  
 14 Ga. CRS (Opt'l)  
 16 Ga. Stainless Steel (Opt'l)  
 14 Ga. Stainless Steel (Opt'l)  
 14 Ga. Aluminum (Opt'l)  
 12 Ga. Aluminum (Opt'l)  
 HEIGHT:  24"  
 30"  
 36"  
 FINISH:  Baked Powder (Std)  
 Baked Metallic (Opt'l)

**ACCESSORIES:**

LV Overlapping Type  
 All accessories return to the wall at the bottom and have pre-punched holes for fastening to the wall.

**ELEMENT:**

- TYPE:  Cu/Al (Mechanically Expanded)  
 LENGTHS: 2'0" thru 12'6" in 1" Increments for 1" & 1-1/4" Cu.  
 2'0" thru 8'0" in 1" Increments for 3/4" Cu.  
 One End Flared (Std)  
 See Catalog for Working Pressures

**DAMPER:**

- Damper Blades Factory Installed  
 Knob Damper (Opt'l)  
 Tamper Resistant (Opt'l)

**BACKPLATE:**

- TYPE:  Partial B/P  
 LENGTHS: 8'0" Only  
 MAT'L:  20 Ga. Prepainted (Std)  
 18 Ga. Galvannealed (Opt'l)  
 TYPE:  Full Ht. B/P (Opt'l)  
 LENGTHS: 2'0" thru 8'0" in 6" Increments  
 MAT'L:  20 Ga. Galvannealed (Opt'l)  
 20 Ga. Painted (Opt'l)  
 18 Ga. Painted (Opt'l)

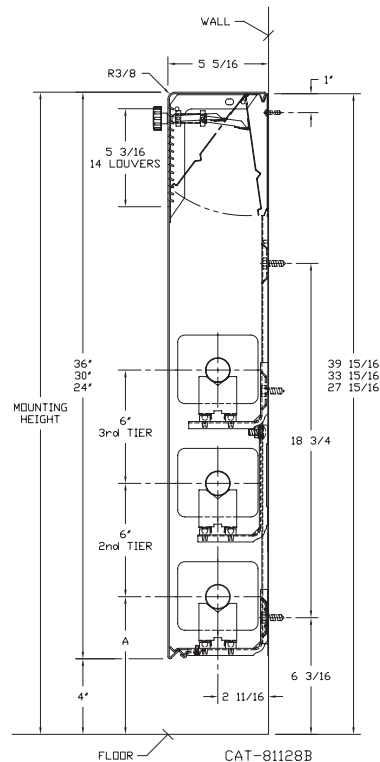
**AIRSEAL:**

- 1/8" x 3/8" Closed Cell (Opt'l)

**BRACKETS:**

- Water Brkt (with Stand-Off)  
 Stand-Off not required with 24" height  
 B.B. Hanger, Bracket Mtd  
 B.B. Hanger, Wall Mtd  
 Wall Mtd B.B. Hanger required for 3rd Tier Element

ELEMENT TUBE SIZE	FIN SIZE HEIGHT x WIDTH	CRADLE NUMBER	A
3/4" COPPER	3-5/8 x 4-1/4	2	7"
3/4" COPPER	4-1/4 x 4-1/4	3A	7-3/8"
1" COPPER	3-5/8 x 4-1/4	2	7-3/16"
1" COPPER	4-1/4 x 4-1/4	2	7-3/16"
1-1/4" COPPER	3-5/8 x 4-1/4	2	7-5/16"
1-1/4" COPPER	4-1/4 x 4-1/4	2	7-5/16"
1" STEEL	4-1/4 x 4-1/4	2	7-5/16"
1-1/4" STEEL	4-1/4 x 4-1/4	2	7-1/2"
2" STEEL	4-1/4 x 4-1/4	1	7-1/4"



- LV4-F 24  
 LV4-F 30  
 LV4-F 36



260 North Elm St., Westfield, MA 01085  
 (413) 568-9571  
 www.vulcanrad.com



PROJECT: \_\_\_\_\_ DATE: \_\_\_\_\_  
 LOCATION: \_\_\_\_\_  
 ARCHITECT: \_\_\_\_\_  
 ENGINEER: \_\_\_\_\_  
 CONTRACTOR: \_\_\_\_\_  
 PO NUMBER: \_\_\_\_\_

# LV4-F Style "F" Front Outlet

## COPPER/ALUMINUM ELEMENT RATINGS

### STYLE LT Series "F"

ALL RATINGS ARE BASED ON 3 FPS WATER VELOCITY, 65°F AT

TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FIN PER FT.	FIN THICKNESS IN INCHES	ENCL HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215°F FACTOR	HOT WATER (AVG.)												
									200°F	190°F	180°F	170°F	160°F	150°F	140°F	130°F	120°F	110°F	100°F		
									CORRECTION FACTORS FOR AVERAGE WATER TEMPERATURES												
3/4"	VC3/4-433	3-5/8" x 4-1/4"	32	.020	24	1	28	1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26	.20	.15		
					24	2-6 CL	28	2410	2070	1880	1660	1470	1280	1080	960	800	630	480	360		
					24	3-6 CL	28	2770	2380	2160	1910	1690	1470	1250	1110	910	720	550	420		
					30	1	34	1800	1550	1400	1240	1100	950	810	720	590	470	360	270		
					30	2-6 CL	34	2380	2050	1860	1640	1450	1260	1070	950	790	620	480	360		
					30	3-6 CL	34	2740	2360	2140	1890	1670	1450	1230	1100	900	710	550	410		
					36	1	40	1980	1700	1540	1370	1210	1050	890	790	650	510	400	300		
					36	2-6 CL	40	2620	2250	2040	1810	1600	1390	1180	1050	860	680	520	390		
					36	3-6 CL	40	3010	2590	2350	2080	1840	1600	1350	1200	990	780	600	450		
					24	1	28	1870	1610	1460	1290	1140	990	840	750	620	490	370	280		
					24	2-6 CL	28	2670	2300	2080	1840	1630	1420	1200	1070	880	690	530	400		
					24	3-6 CL	28	3040	2610	2370	2100	1850	1610	1370	1220	1000	790	610	460		
30	1	34	2080	1790	1620	1440	1270	1100	940	830	690	540	420	310							
30	2-6 CL	34	2750	2370	2150	1900	1680	1460	1240	1100	910	720	550	410							
30	3-6 CL	34	3130	2690	2440	2160	1910	1660	1410	1250	1030	810	630	470							
36	1	40	2290	1970	1790	1580	1400	1210	1030	920	760	600	460	340							
36	2-6 CL	40	3030	2610	2360	2090	1850	1610	1360	1210	1000	790	610	450							
36	3-6 CL	40	3450	2970	2690	2380	2100	1830	1550	1380	1140	900	690	520							
3/4"	VC3/4-434	3-5/8" x 4-1/4"	40	.020	24	1	28	2230	1920	1740	1540	1360	1180	1000	890	740	580	450	330		
					24	2-6 CL	28	2940	2530	2290	2030	1790	1560	1320	1180	970	760	590	440		
					24	3-6 CL	28	3320	2860	2590	2290	2030	1760	1490	1330	1100	860	660	500		
					30	1	34	2480	2130	1930	1710	1510	1310	1120	990	820	640	500	370		
					30	2-6 CL	34	3280	2820	2560	2260	2000	1740	1480	1310	1080	850	660	490		
					30	3-6 CL	34	3710	3190	2890	2560	2260	1970	1670	1480	1220	960	740	560		
					36	1	40	2730	2350	2130	1880	1670	1450	1230	1090	900	710	550	410		
					36	2-6 CL	40	3610	3100	2820	2490	2200	1910	1620	1440	1190	940	720	540		
					36	3-6 CL	40	4080	3510	3180	2820	2490	2160	1840	1630	1350	1060	820	610		
					24	1	28	1640	1410	1280	1130	1000	870	740	660	540	430	330	250		
					24	2-6 CL	28	2540	2180	1980	1750	1550	1350	1140	1020	840	660	510	380		
					24	3-6 CL	28	2920	2510	2280	2010	1780	1550	1310	1170	960	760	580	440		
30	1	34	1820	1570	1420	1260	1110	960	820	730	600	470	360	270							
30	2-6 CL	34	2410	2070	1880	1660	1470	1280	1080	960	800	630	480	360							
30	3-6 CL	34	2770	2380	2160	1910	1690	1470	1250	1110	910	720	550	420							
36	1	40	2000	1720	1560	1380	1220	1060	900	800	660	520	400	300							
36	2-6 CL	40	2650	2280	2070	1830	1620	1400	1190	1060	870	690	530	400							
36	3-6 CL	40	3050	2620	2380	2100	1860	1620	1370	1220	1010	790	610	460							
1"	VC433	3-5/8" x 4-1/4"	32	.020	24	1	28	1950	1680	1520	1350	1190	1030	880	780	640	510	390	290		
					24	2-6 CL	28	2750	2370	2150	1900	1680	1460	1240	1100	910	720	550	410		
					24	3-6 CL	28	3130	2690	2440	2160	1910	1660	1410	1250	1030	810	630	470		
					30	1	34	2170	1870	1690	1500	1320	1150	980	870	720	560	430	330		
					30	2-6 CL	34	2870	2470	2240	1980	1750	1520	1290	1150	950	750	570	430		
					30	3-6 CL	34	3270	2810	2550	2260	1990	1730	1470	1310	1080	850	650	490		
					36	1	40	2390	2060	1860	1650	1460	1270	1080	960	790	620	480	360		
					36	2-6 CL	40	3160	2720	2460	2180	1930	1670	1420	1260	1040	820	630	470		
					36	3-6 CL	40	3600	3100	2810	2480	2200	1910	1620	1440	1190	940	720	540		
					24	1	28	2330	2000	1820	1610	1420	1230	1050	930	770	610	470	350		
					24	2-6 CL	28	2760	2370	2150	1900	1680	1460	1240	1100	910	720	550	410		
					24	3-6 CL	28	3120	2680	2430	2150	1900	1650	1400	1250	1030	810	620	470		
30	1	34	2590	2230	2020	1790	1580	1370	1170	1040	850	670	520	390							
30	2-6 CL	34	3430	2950	2680	2370	2090	1820	1540	1370	1130	890	690	510							
30	3-6 CL	34	3880	3340	3030	2680	2370	2060	1750	1550	1280	1010	780	580							
36	1	40	2850	2450	2220	1970	1740	1510	1280	1140	940	740	570	430							
36	2-6 CL	40	3770	3240	2940	2600	2300	2000	1700	1510	1240	980	750	570							
36	3-6 CL	40	4260	3660	3320	2940	2600	2260	1920	1700	1410	1110	850	640							
1-1/4"	VC1433	3-5/8" x 4-1/4"	32	.020	24	1	28	1600	1380	1250	1100	980	850	720	640	530	420	320	240		
					24	2-6 CL	28	2500	2150	1950	1720	1530	1330	1130	1000	830	650	500	380		
					24	3-6 CL	28	2880	2480	2250	1990	1760	1530	1300	1150	950	750	580	430		
					30	1	34	1780	1530	1390	1230	1090	940	800	710	590	460	360	270		
					30	2-6 CL	34	2360	2030	1840	1630	1440	1250	1060	940	780	610	470	350		
					30	3-6 CL	34	2710	2330	2110	1870	1650	1440	1220	1080	890	700	540	410		
					36	1	40	1960	1690	1530	1350	1200	1040	880	780	650	510	390	290		
					36	2-6 CL	40	2600	2240	2030	1790	1590	1380	1170	1040	860	680	520	390		
					36	3-6 CL	40	2990	2570	2330	2060	1820	1580	1350	1200	990	780	600	450		
					24	1	28	1910	1640	1490	1320	1170	1010	860	760	630	500	380	290		
					24	2-6 CL	28	2700	2320	2110	1860	1650	1430	1220	1080	890	700	540	410		
					24	3-6 CL	28	3080	2650	2400	2130	1880	1630	1390	1230	1020	800	620	460		
30	1	34	2120	1820	1650	1460	1290	1120	950	850	700	550	420	320							
30	2-6 CL	34	2810	2420	2190	1940	1710	1490	1260	1120	930	730	560	420							
30	3-6 CL	34	3200	2750	2500	2210	1950	1700	1440	1280	1060	830	640	480							
36	1	40	2330	2000	1820	1610	1420	1230	1050	930	770	610	470	350							
36	2-6 CL	40	3080	2650	2400	2130	1880	1630	1390	1230	1020	800	620	460							
36	3-6 CL	40	3510	3020	2740	2420	2140	1860	1580	1400	1160	910	700	530							
1-1/4"	VC1435	3-5/8" x 4-1/4"	50	.020	24	1	28	2230	1920	1740	1540	1360	1180	1000	890	740	580	450	330		
					24	2-6 CL	28	2650	2280	2070	1830	1620	1400	1190	1060	870	690	530	400		
					24	3-6 CL	28	2990	2570	2330	2060	1820	1580	1							

# LV4-F Style "F" Front Outlet

## COPPER/ALUMINUM ELEMENT RATINGS

ALL RATINGS ARE BASED ON 3 FPS WATER VELOCITY, 65°EAT

### STYLE LT Series "F"

TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FIN PER FT.	FIN THICKNESS IN INCHES	ENCL HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215°F FACTOR	HOT WATER (AVG.)										
									200°F	190°F	180°F	170°F	160°F	150°F	140°F	130°F	120°F	110°F	100°F
									CORRECTION FACTORS FOR AVERAGE WATER TEMPERATURES										
3/4"	VC3/4-43	4-1/4" SQ.	32	.020	24	1	28	1720	1480	1340	1190	1050	910	770	690	570	450	340	260
					24	2-6 CL	28	2650	2280	2070	1830	1620	1400	1190	1060	870	690	530	400
					24	3-6 CL	28	3050	2620	2380	2100	1860	1620	1370	1220	1010	790	610	460
					30	1	34	1910	1640	1490	1320	1170	1010	860	760	630	500	380	290
					30	2-6 CL	34	2530	2180	1970	1750	1540	1340	1140	1010	830	660	510	380
					30	3-6 CL	34	2910	2500	2270	2010	1780	1540	1310	1160	960	760	580	440
					36	1	40	2100	1810	1640	1450	1280	1110	950	840	690	550	420	320
					36	2-6 CL	40	2780	2390	2170	1920	1700	1470	1250	1110	920	720	560	420
					36	3-6 CL	40	3200	2750	2500	2210	1950	1700	1440	1280	1060	830	640	480
					24	1	28	2290	1970	1790	1580	1400	1210	1030	920	760	600	460	340
					24	2-6 CL	28	3000	2580	2340	2070	1830	1590	1350	1200	990	780	600	450
					24	3-6 CL	28	3420	2940	2670	2360	2090	1810	1540	1370	1130	890	680	510
3/4"	VC3/4-44	4-1/4" SQ.	40	.020	24	1	34	2550	2190	1990	1760	1560	1350	1150	1020	840	660	510	380
					30	2-6 CL	34	3380	2910	2640	2330	2060	1790	1520	1350	1120	880	680	510
					30	3-6 CL	34	3850	3310	3000	2660	2350	2040	1730	1540	1270	1000	770	580
					36	1	40	2810	2420	2190	1940	1710	1490	1260	1120	930	730	560	420
					36	2-6 CL	40	3720	3200	2900	2570	2270	1970	1670	1490	1230	970	740	560
					36	3-6 CL	40	4240	3650	3310	2930	2590	2250	1910	1700	1430	1100	850	640
					24	1	28	2400	2060	1870	1660	1460	1270	1080	960	790	620	480	360
					24	2-6 CL	28	3185	2740	2480	2200	1940	1690	1430	1270	1050	830	640	480
					24	3-6 CL	28	3600	3100	2810	2480	2200	1910	1620	1440	1190	940	720	540
					30	1	34	2670	2300	2080	1840	1630	1420	1200	1070	880	690	530	400
					30	2-6 CL	34	3540	3040	2760	2440	2160	1880	1590	1420	1170	920	710	530
					30	3-6 CL	34	4000	3440	3120	2760	2440	2120	1800	1600	1320	1040	800	600
3/4"	VC3/4-45	4-1/4" SQ.	50	.020	24	1	40	2940	2530	2290	2030	1790	1560	1320	1180	970	760	590	440
					36	2-6 CL	40	3890	3350	3030	2680	2370	2060	1750	1560	1280	1010	780	580
					36	3-6 CL	40	4400	3780	3430	3040	2680	2330	1980	1760	1450	1140	880	660
					24	1	28	1760	1510	1370	1210	1070	930	790	700	580	460	350	260
					24	2-6 CL	28	2690	2310	2100	1860	1640	1430	1210	1080	890	700	540	400
					24	3-6 CL	28	3090	2660	2410	2130	1880	1640	1390	1240	1020	800	620	460
					30	1	34	1960	1690	1530	1350	1200	1040	880	780	650	510	390	290
					30	2-6 CL	34	2600	2240	2030	1790	1590	1380	1170	1040	860	680	520	390
					30	3-6 CL	34	2990	2570	2330	2060	1820	1580	1350	1200	990	780	600	450
					36	1	40	2160	1860	1680	1490	1320	1140	970	860	710	560	430	320
					36	2-6 CL	40	2860	2460	2230	1970	1740	1520	1290	1140	940	740	570	430
					36	3-6 CL	40	3290	2830	2570	2270	2010	1740	1480	1320	1090	860	660	490
1"	VC43	4-1/4" SQ.	32	.020	24	1	28	2130	1830	1660	1470	1300	1130	960	850	700	550	430	320
					24	2-6 CL	28	2860	2460	2230	1970	1740	1520	1290	1140	940	740	570	430
					24	3-6 CL	28	3260	2800	2540	2250	1990	1730	1470	1300	1080	850	650	490
					30	1	34	2370	2040	1850	1640	1450	1260	1070	950	780	620	470	360
					30	2-6 CL	34	3140	2700	2450	2170	1920	1660	1410	1260	1040	820	630	470
					30	3-6 CL	34	3580	3080	2790	2470	2180	1900	1610	1430	1180	930	720	540
					36	1	40	2610	2240	2040	1800	1590	1380	1170	1040	860	680	520	390
					36	2-6 CL	40	3460	2980	2700	2390	2110	1830	1560	1380	1140	900	690	520
					36	3-6 CL	40	3940	3390	3070	2720	2400	2090	1770	1580	1300	1020	790	590
					24	1	28	2430	2090	1900	1680	1480	1290	1090	970	800	630	490	360
					24	2-6 CL	28	2930	2520	2290	2020	1790	1550	1320	1170	970	760	590	440
					24	3-6 CL	28	3310	2850	2580	2280	2020	1750	1490	1320	1090	860	660	500
30	1	34	2700	2320	2110	1860	1650	1430	1220	1080	890	700	540	410					
30	2-6 CL	34	3570	3070	2780	2460	2180	1890	1610	1430	1180	930	710	540					
30	3-6 CL	34	4030	3470	3140	2780	2460	2140	1810	1610	1330	1050	810	600					
36	1	40	2970	2550	2320	2050	1810	1570	1340	1190	980	770	590	450					
36	2-6 CL	40	3930	3380	3070	2710	2400	2080	1770	1570	1300	1020	790	590					
36	3-6 CL	40	4440	3820	3460	3060	2710	2350	2000	1780	1470	1150	890	670					
1-1/4"	VC143	4-1/4" SQ.	32	.020	24	1	28	1730	1490	1350	1190	1060	920	780	690	570	450	350	260
					24	2-6 CL	28	2640	2270	2060	1820	1610	1400	1190	1060	870	690	530	400
					24	3-6 CL	28	3040	2610	2370	2100	1850	1610	1370	1220	1000	790	610	460
					30	1	34	1920	1650	1500	1320	1170	1020	860	770	630	500	380	290
					30	2-6 CL	34	2540	2180	1980	1750	1550	1350	1140	1020	840	660	510	380
					30	3-6 CL	34	2920	2510	2280	2010	1780	1550	1310	1170	960	760	580	440
					36	1	40	2110	1810	1650	1460	1290	1120	950	840	700	550	420	320
					36	2-6 CL	40	2790	2400	2180	1930	1700	1480	1260	1120	920	730	560	420
					36	3-6 CL	40	3210	2760	2500	2210	1960	1700	1440	1280	1060	830	640	480
					24	1	28	2100	1810	1640	1450	1280	1110	950	840	690	550	420	320
					24	2-6 CL	28	2810	2420	2190	1940	1710	1490	1260	1120	930	730	560	420
					24	3-6 CL	28	3200	2750	2500	2210	1950	1700	1440	1280	1060	830	640	480
30	1	34	2340	2010	1830	1610	1430	1240	1050	940	770	610	470	350					
30	2-6 CL	34	3100	2670	2420	2140	1890	1640	1400	1240	1020	810	620	470					
30	3-6 CL	34	3530	3040	2750	2440	2150	1870	1590	1410	1160	920	710	530					
36	1	40	2580	2220	2010	1780	1570	1370	1160	1030	850	670	520	390					
36	2-6 CL	40	3420	2940	2670	2360	2090	1810	1540	1370	1130	890	680	510					
36	3-6 CL	40	3900	3350	3040	2690	2380	2070	1760	1560	1290	1010	780	590					
1-1/4"	VC145	4-1/4" SQ.	50	.020	24	1	28	2400	2060	1870	1660	1460	1270	1080	960	790	620	480	360
					24	2-6 CL	28	2870	2470	2240	1980	1750	1520	1290	1150	950	750	570	430
					24	3-6 CL	28	3240	2790	2530	2240	1980	1720	1460	1300	1070	840	650	490
					30	1	34	2670	2300	2080	1840	1630	1420	1200	1070	880	690	530	400
					30	2-6 CL	34	3540	3040	2760	2440	2160	1880	1590	1420	1170	920	710	530

# LV4-F Style "F" Front Outlet

## STEEL ELEMENT RATINGS

### STYLE LT Series "F"

ALL RATINGS ARE BASED ON 3 FPS WATER VELOCITY, 65°EAT

TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FIN PER FT.	FIN THICKNESS IN INCHES	ENCL HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215°F FACTOR	HOT WATER (AVG.)														
									200°F	190°F	180°F	170°F	160°F	150°F	140°F	130°F	120°F	110°F	100°F				
									CORRECTION FACTORS FOR AVERAGE WATER TEMPERATURES														
1"	VS43	4-1/4" SQ.	32	.032	24	1	28	1470	1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26	.20	.15			
					24	2-6 CL	28	2225	1910	1740	1540	1360	1180	1000	890	730	580	450	330	290	220		
					24	3-6 CL	28	2560	2200	2000	1770	1560	1360	1150	1020	840	670	510	380	290	220		
					30	1	34	1630	1400	1270	1120	990	860	730	650	540	420	330	240	180	140		
					30	2-6 CL	34	2160	1860	1680	1490	1320	1140	970	860	710	560	430	320	240	180	140	
					30	3-6 CL	34	2480	2130	1930	1710	1510	1310	1120	990	820	640	500	370	280	210	160	
					36	1	40	1790	1540	1400	1240	1090	950	810	720	590	470	360	270	200	150	110	
					36	2-6 CL	40	2370	2040	1850	1640	1450	1260	1070	950	780	620	470	360	270	200	150	110
					36	3-6 CL	40	2730	2350	2130	1880	1670	1450	1230	1090	900	710	550	410	310	230	170	130
					24	1	28	1705	1470	1330	1180	1040	900	770	680	560	440	340	260	190	140	100	70
					24	2-6 CL	28	2440	2100	1900	1680	1490	1290	1100	980	810	630	490	370	280	210	150	110
					24	3-6 CL	28	2780	2390	2170	1920	1700	1470	1250	1110	920	720	560	420	320	240	180	140
30	1	34	1900	1630	1480	1310	1160	1010	860	760	630	490	380	290	220	160	120						
30	2-6 CL	34	2520	2170	1970	1740	1540	1340	1130	1010	830	660	500	380	290	220	160	120					
30	3-6 CL	34	2870	2470	2240	1980	1750	1520	1290	1150	950	750	570	430	330	250	190	140					
36	1	40	2090	1800	1630	1440	1270	1110	940	840	690	540	420	310	230	170	130						
36	2-6 CL	40	2770	2380	2160	1910	1690	1470	1250	1110	910	720	550	420	310	230	170	130					
36	3-6 CL	40	3160	2720	2460	2180	1930	1670	1420	1260	1040	820	630	470	350	270	200	150					
1"	VS44	4-1/4" SQ.	40	.032	24	1	28	1790	1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26	.20	.15			
					24	2-6 CL	28	2500	2150	1950	1720	1530	1330	1130	1000	830	650	500	380	290	220		
					24	3-6 CL	28	2820	2430	2200	1950	1720	1490	1270	1130	930	730	560	420	310	230	170	
					30	1	34	1990	1710	1550	1370	1210	1050	900	800	660	520	400	300	220	160	120	
					30	2-6 CL	34	2630	2260	2050	1810	1600	1390	1180	1050	870	680	530	390	290	220	160	120
					30	3-6 CL	34	2970	2550	2320	2050	1810	1570	1340	1190	980	770	590	450	340	260	190	140
					36	1	40	2190	1880	1710	1510	1340	1160	990	880	720	570	440	330	250	190	140	
					36	2-6 CL	40	2900	2490	2260	2000	1770	1540	1310	1160	960	750	580	440	330	250	190	140
					36	3-6 CL	40	3280	2820	2560	2260	2000	1740	1480	1310	1080	850	660	490	370	280	210	150
					24	1	28	1280	1100	1000	880	780	680	580	510	420	330	260	190	140	100	70	
					24	2-6 CL	28	2060	1770	1610	1420	1260	1090	930	820	680	540	410	310	230	170	130	
					24	3-6 CL	28	2370	2040	1850	1640	1450	1260	1070	950	780	620	470	360	270	200	150	
30	1	34	1420	1220	1110	980	870	750	640	570	470	370	280	210	150	110							
30	2-6 CL	34	1880	1620	1470	1300	1150	1000	850	750	620	490	380	280	210	150	110						
30	3-6 CL	34	2160	1860	1680	1490	1320	1140	970	860	710	560	430	320	240	180	140						
36	1	40	1560	1340	1220	1080	950	830	700	620	510	410	310	230	170	130							
36	2-6 CL	40	2070	1780	1610	1430	1260	1100	930	830	680	540	410	310	230	170	130						
36	3-6 CL	40	2380	2050	1860	1640	1450	1260	1070	950	790	620	480	360	270	200	150						
1-1/4"	VS143	4-1/4" SQ.	32	.032	24	1	28	1660	1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26	.20	.15			
					24	2-6 CL	28	2400	2060	1870	1660	1460	1270	1080	960	790	620	480	360	270	200	150	
					24	3-6 CL	28	2740	2360	2140	1890	1670	1450	1230	1100	900	710	550	410	310	230	170	
					30	1	34	1850	1590	1440	1280	1130	980	830	740	610	480	370	280	210	150		
					30	2-6 CL	34	2450	2110	1910	1690	1490	1300	1100	980	810	640	490	370	280	210	150	
					30	3-6 CL	34	2790	2400	2180	1930	1700	1480	1260	1120	920	730	560	420	320	240	180	
					36	1	40	2040	1750	1590	1410	1240	1080	920	820	670	530	410	310	230	170		
					36	2-6 CL	40	2700	2320	2110	1860	1650	1430	1220	1080	890	700	540	410	310	230	170	
					36	3-6 CL	40	3080	2650	2400	2130	1880	1630	1390	1230	1020	800	620	460	350	260	190	
					24	1	28	1775	1530	1380	1220	1080	940	800	710	590	460	360	270	200	150		
					24	2-6 CL	28	2450	2110	1910	1690	1490	1300	1100	980	810	640	490	370	280	210	150	
					24	3-6 CL	28	2770	2380	2160	1910	1690	1470	1250	1110	910	720	550	420	310	230	170	
30	1	34	1970	1690	1540	1360	1200	1040	890	790	650	510	390	300	220	160							
30	2-6 CL	34	2610	2240	2040	1800	1590	1380	1170	1040	860	680	520	390	290	220	160						
30	3-6 CL	34	2950	2540	2300	2040	1800	1560	1330	1180	970	770	590	440	330	250	190						
36	1	40	2170	1870	1690	1500	1320	1150	980	870	720	560	430	330	250	190							
36	2-6 CL	40	2870	2470	2240	1980	1750	1520	1290	1150	950	750	570	430	330	250	190						
36	3-6 CL	40	3240	2790	2530	2240	1980	1720	1460	1300	1070	840	650	490	370	280	210						
1-1/4"	VS145	4-1/4" SQ.	50	.032	24	1	28	1230	1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26	.20	.15			
					24	2-6 CL	28	1940	1670	1510	1340	1180	1030	870	780	640	500	390	290	220			
					24	3-6 CL	28	2230	1920	1740	1540	1360	1180	1000	890	740	580	450	330	240	180		
					30	1	34	1370	1180	1070	950	840	730	620	550	450	360	270	210	150			
					30	2-6 CL	34	1810	1560	1410	1250	1100	960	810	720	600	470	360	270	200	150		
					30	3-6 CL	34	2080	1790	1620	1440	1270	1100	940	830	690	540	420	310	230	170		
					36	1	40	1510	1300	1180	1040	920	800	680	600	500	390	300	230	170			
					36	2-6 CL	40	2000	1720	1560	1380	1220	1060	900	800	660	520	400	300	220	160		
					36	3-6 CL	40	2300	1980	1790	1590	1400	1220	1040	920	760	600	460	350	260	190		
					24	1	28	1450	1250	1130	1000	880	770	650	580	480	380	290	220	160			
					24	2-6 CL	28	2170	1870	1690	1500	1320	1150	980	870	720	560	430	330	250	190		
					24	3-6 CL	28	2500	2150	1950	1720	1530	1330	1130	1000	830	650	500	380	290	220		
30	1	34	1610	1380	1260	1110	980	850	720	640	530	420	320	240	180								
30	2-6 CL	34	2130	1830	1660	1470	1300	1130	960	850	700												

# Design Data

## COMMERCIAL FINNED TUBE CHARTS FOR RATING CORRECTIONS

For assistance with ratings and selection, please use our online Specifier.

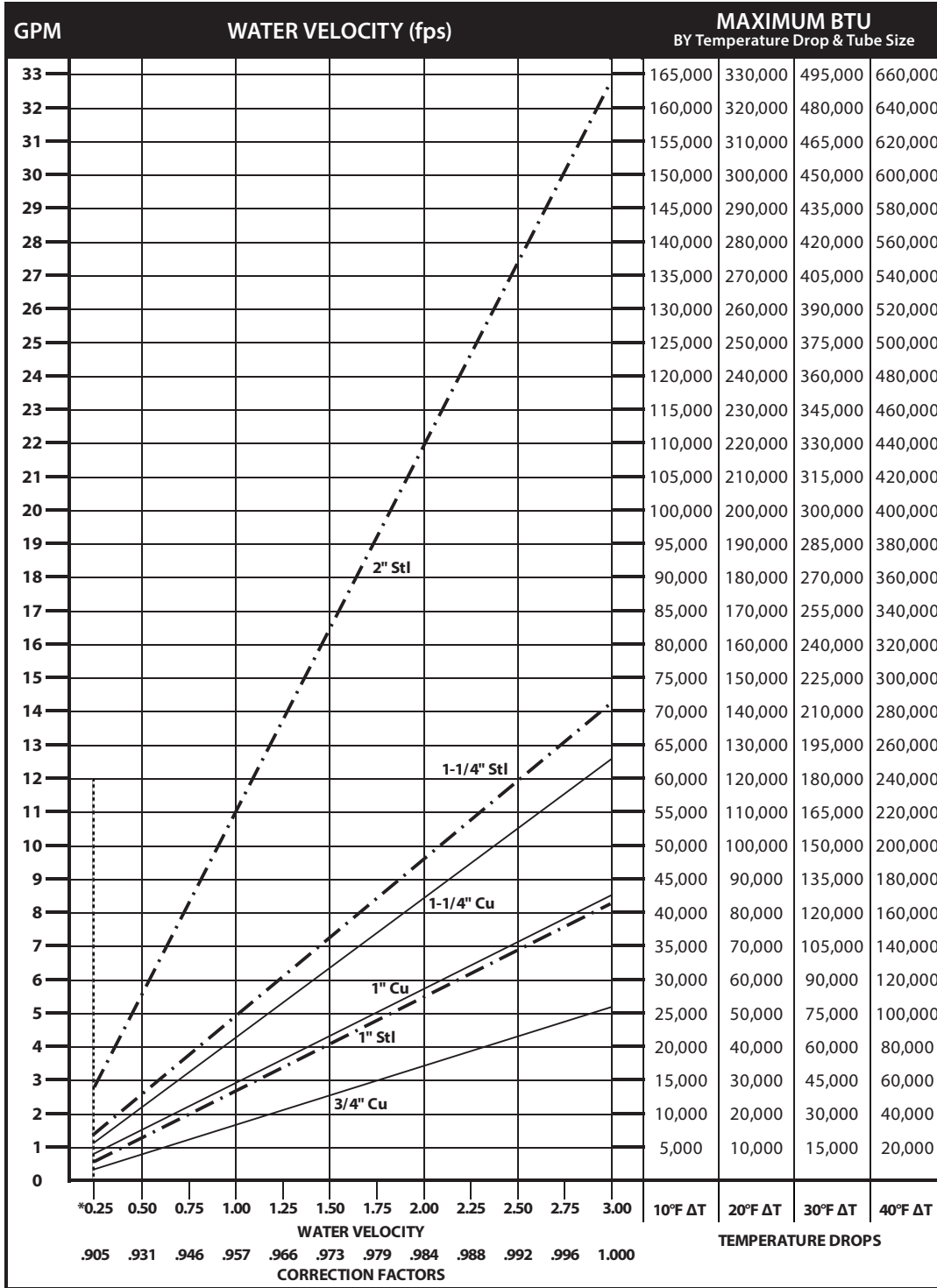
CORRECTION FACTORS FOR WATER TEMPERATURES AND AIR TEMPERATURES OTHER THAN STANDARD															
AVERAGE WATER TEMP. °F	ENTERING AIR TEMPERATURE °F														
	45	55	STD 65	70	75	80	85	90	95	100	110	120	130	140	150
90	.19	.13	.11	.06											
100	.25	.19	.15	.11	.08	.06									
110	.31	.25	.20	.16	.13	.11	.08	.06							
120	.38	.31	.26	.21	.19	.16	.13	.11	.08	.06					
130	.45	.38	.33	.28	.25	.21	.19	.16	.13	.11	.06				
140	.53	.45	.40	.34	.31	.28	.25	.21	.19	.16	.11	.06			
150	.61	.53	.45	.41	.38	.34	.31	.28	.25	.21	.16	.11	.06		
160	.69	.61	.53	.49	.45	.41	.38	.34	.31	.28	.21	.16	.11	.06	
170	.77	.69	.61	.57	.53	.49	.45	.41	.38	.34	.28	.21	.16	.11	.06
180	.86	.77	.69	.65	.61	.57	.53	.49	.45	.41	.34	.28	.21	.16	.11
190	.95	.86	.78	.73	.69	.65	.61	.57	.53	.49	.41	.34	.28	.21	.16
200	1.05	.95	.86	.82	.77	.73	.69	.65	.61	.57	.49	.41	.34	.28	.21
210	1.14	1.05	.95	.91	.86	.82	.77	.73	.69	.65	.57	.49	.41	.34	.28
▶ 215 (STD.)	1.19	1.09	1.00	.95	.91	.86	.82	.77	.73	.69	.61	.53	.45	.38	.31
220	1.24	1.14	1.05	1.00	.95	.91	.86	.82	.77	.73	.65	.57	.49	.41	.34
230	1.34	1.24	1.14	1.09	1.05	1.00	.95	.91	.86	.82	.73	.65	.57	.49	.41
240	1.44	1.34	1.25	1.19	1.14	1.09	1.05	1.00	.95	.91	.82	.73	.65	.57	.49
250	1.55	1.44	1.34	1.29	1.24	1.19	1.14	1.09	1.05	1.00	.91	.82	.73	.65	.57
260	1.66	1.55	1.44	1.39	1.34	1.29	1.24	1.19	1.14	1.09	1.00	.91	.82	.73	.65
270	1.76	1.66	1.55	1.50	1.44	1.39	1.34	1.29	1.24	1.19	1.09	1.00	.91	.82	.73
280	1.87	1.76	1.66	1.60	1.55	1.50	1.44	1.39	1.34	1.29	1.19	1.09	1.00	.91	.82
290	1.99	1.87	1.76	1.71	1.66	1.60	1.55	1.50	1.44	1.39	1.29	1.19	1.09	1.00	.91
300	2.10	1.99	1.87	1.82	1.76	1.71	1.66	1.60	1.55	1.50	1.39	1.29	1.19	1.09	1.00

CORRECTION FACTORS FOR STEAM PRESSURES AND AIR TEMPERATURES OTHER THAN STANDARD																
STEAM		TEMP. °F	ENTERING AIR TEMPERATURE °F													
PRESSURE			45	55	STD 65	70	75	80	85	90	100	110	120	130	140	150
GAUGE	ABS. PSI															
(VAC) 15" HG	7.32	178.9	0.90	0.80	0.70	0.65	0.60	0.56	0.51	0.45	0.39	0.32	0.25	0.18	0.13	0.08
(VAC) 10" HG	9.78	192.2	1.02	0.91	0.81	0.76	0.71	0.66	0.62	0.55	0.48	0.40	0.33	0.26	0.20	0.14
(VAC) 5" HG	12.25	202.9	1.11	1.00	0.90	0.85	0.79	0.75	0.70	0.63	0.56	0.48	0.40	0.33	0.27	0.20
▶ 0 PSI	14.696	212.0	1.19	1.09	0.97	0.92	0.87	0.82	0.77	0.70	0.63	0.54	0.46	0.38	0.31	0.25
.899	15.595	215.0	1.22	1.11	1.00	0.95	0.90	0.84	0.80	0.75	0.65	0.57	0.48	0.40	0.33	0.26
5	19.70	227.1	1.34	1.22	1.11	1.05	1.00	0.95	0.90	0.81	0.75	0.66	0.57	0.49	0.41	0.34
10	24.70	239.4	1.45	1.33	1.22	1.17	1.11	1.05	1.00	0.91	0.85	0.75	0.66	0.58	0.50	0.42
15	29.70	249.8	1.55	1.43	1.31	1.26	1.20	1.14	1.09	1.00	0.94	0.84	0.75	0.66	0.57	0.49
20	34.70	258.5	1.63	1.52	1.40	1.33	1.28	1.23	1.17	1.07	1.02	0.92	0.82	0.73	0.64	0.55
25	39.70	266.8	1.71	1.59	1.47	1.41	1.36	1.30	1.25	1.15	1.09	0.98	0.89	0.80	0.71	0.62
30	44.70	274.0	1.78	1.66	1.54	1.48	1.42	1.37	1.31	1.21	1.15	1.05	0.95	0.85	0.76	0.68
40	54.70	286.7	1.91	1.79	1.66	1.61	1.54	1.49	1.43	1.32	1.27	1.16	1.06	0.97	0.87	0.78
50	64.70	297.7	2.02	1.90	1.77	1.71	1.65	1.60	1.54	1.42	1.37	1.26	1.16	1.06	0.96	0.87
60	74.70	307.3	2.10	2.00	1.87	1.81	1.75	1.69	1.63	1.51	1.47	1.35	1.25	1.15	1.05	0.95
70	84.70	316.0	2.20	2.09	1.95	1.89	1.83	1.77	1.71	1.59	1.55	1.44	1.33	1.23	1.12	1.03
80	94.70	323.9	2.27	2.17	2.03	1.97	1.91	1.85	1.80	1.69	1.63	1.52	1.41	1.31	1.20	1.10
90	104.70	331.2	2.36	2.24	2.11	2.05	1.98	1.93	1.87	1.74	1.70	1.59	1.48	1.38	1.28	1.17
100	114.70	337.9	2.43	2.31	2.18	2.11	2.05	2.00	1.94	1.81	1.77	1.65	1.54	1.44	1.33	1.23
125	139.70	352.9	2.59	2.47	2.33	2.27	2.21	2.16	2.10	1.96	1.92	1.80	1.69	1.59	1.48	1.38
150	164.70	365.9	2.73	2.62	2.47	2.43	2.35	2.29	2.23	2.08	2.05	1.94	1.82	1.72	1.61	1.51
175	189.70	377.4	2.86	2.74	2.60	2.54	2.47	2.41	2.35	2.21	2.17	2.05	1.95	1.85	1.73	1.63
200	214.70	387.8	2.95	2.85	2.71	2.63	2.58	2.52	2.47	2.31	2.29	2.17	2.06	1.96	1.84	1.75

From Keenan and Keyes — Linear Interpolation. NOTE: Gauge pressure should be corrected for altitude.

Rate of pitch for steam 1/2" drop over 20-foot run.

# Design Data



## DYNAMIC FORMULAS

$$\text{BTU} = \text{GPM} \times 500 \times \text{TD}$$

$$\text{GPM} = \left( \frac{\text{BTU}}{500} \right) \div \text{TD}$$

$$\text{TD} = \left( \frac{\text{BTU}}{500} \right) \div \text{GPM}$$

\*Do not design below .25 fps.

## Pressure Drop at Given Water Velocities (Feet of Water per 100 ft. of pipe) based on Hazen - Williams calculation

Nominal Pipe Size	Water Velocity (ft/sec)											
	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
3/4" Copper	0.06	0.20	0.42	0.72	1.09	1.53	2.04	2.61	3.25	3.95	4.71	5.53
1" Copper	0.04	0.15	0.32	0.54	0.81	1.14	1.52	1.94	2.42	2.94	3.50	4.11
1 1/4" Copper	0.03	0.12	0.25	0.43	0.64	0.90	1.20	1.54	1.92	2.33	2.78	3.26
1" Steel	0.04	0.15	0.32	0.54	0.81	1.14	1.52	1.95	2.42	2.94	3.51	4.12
1 1/4" Steel	0.03	0.11	0.23	0.40	0.60	0.84	1.12	1.44	1.79	2.17	2.59	3.05
2" Steel	0.02	0.07	0.14	0.25	0.37	0.52	0.69	0.89	1.10	1.34	1.60	1.88

# Design Data

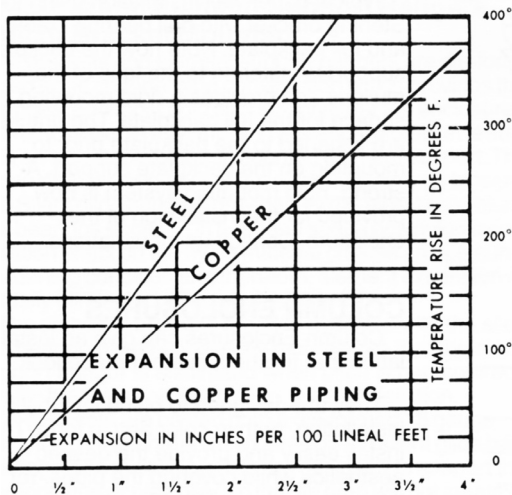
## GUARANTEED WORKING PRESSURES

- 1" IPS – 780 at Temperatures up to 650°F.
- 1-1/4" IPS – 660 at Temperatures up to 650°F.
- 2" IPS – 405 at Temperatures up to 650°F.
- 1-1/4" CU – 194 at Temperatures up to 300°F.
- 1" CU 204 at Temperatures up to 300°F.
- 3/4" CU 218 PSI at Temperatures up to 300°F.

MAXIMUM PRESSURES AT OTHER TEMPERATURES  
ARE AVAILABLE UPON REQUEST.

### Pipe Water Capacities and Quantities Circulated at Velocity of 3 Feet Per Second

Nominal Pipe Size	Pipe I.D. (inches)	Gals Per Lin. Ft.	GPM @ 3' per sec Velocity
3/4" Copper	0.835	0.028	5.12
1" Copper	1.077	0.047	8.52
1 1/4" Copper	1.315	0.071	12.70
1" Steel	1.075	0.047	8.49
1 1/4" Steel	1.395	0.079	14.29
2" Steel	2.115	0.183	32.85



### Glycol Correction Factors

#### Fluid Temperature 200°F

% Solution	Ethylene Glycol	Propylene Glycol
20	.952	.988
30	.921	.968
40	.888	.943
50	.852	.912

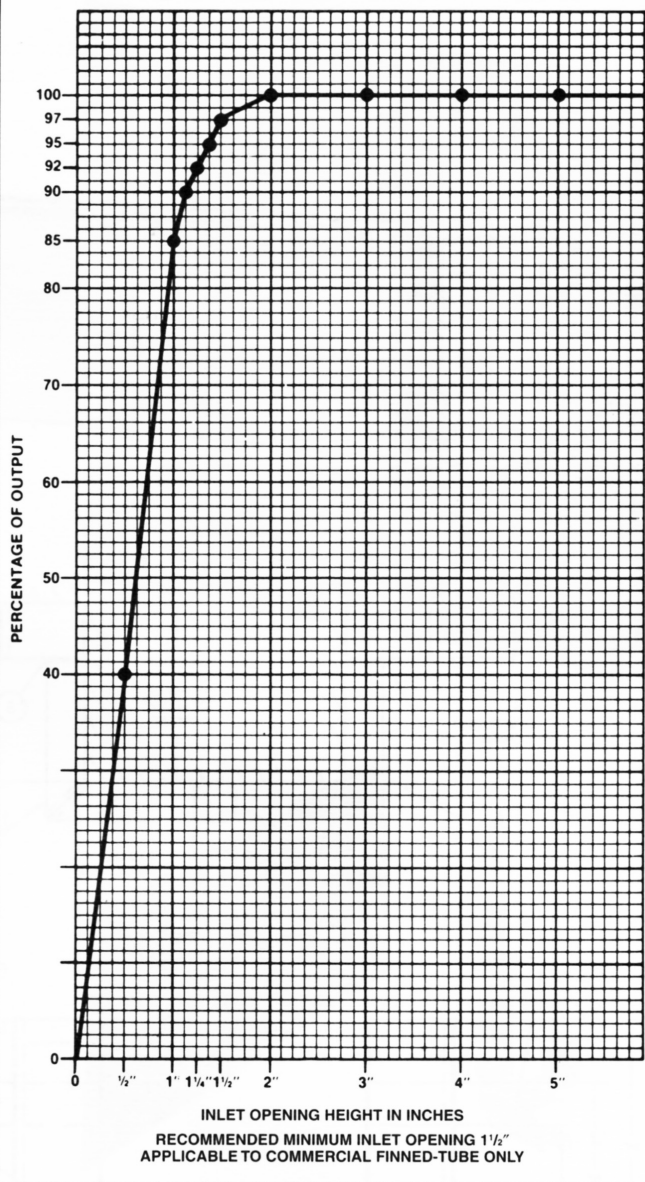
#### Fluid Temperature 180°F

% Solution	Ethylene Glycol	Propylene Glycol
20	.946	.982
30	.913	.961
40	.879	.934
50	.842	.902

#### Fluid Temperature 140°F

% Solution	Ethylene Glycol	Propylene Glycol
20	.934	.97
30	.898	.946
40	.861	.916
50	.821	.881

### INLET VS. OUTPUT/BTUH CAPACITY REDUCTION



### ALTITUDE FACTORS

Approximate factors for convective heat value at varying altitudes

Altitude	Ferrous Units	Copper Alum. Units
Sea Level	1.000	1.000
1,000 ft.	.984	.969
2,000 ft.	.968	.938
3,000 ft.	.952	.908
4,000 ft.	.936	.878
5,000 ft.	.920	.850
6,000 ft.	.904	.822
7,000 ft.	.889	.795
8,000 ft.	.874	.768
9,000 ft.	.859	.743
10,000 ft.	.844	.718
15,000 ft.	.771	.603
20,000 ft.	.703	.502