

# VERSA-LINE

## Submittal

JVA-RD / JVB-RD  
Versa-Line  
Copper/Aluminum and  
Steel Element Ratings

# Specification

### JVA Slip Jointed Enclosure

#### ENCLOSURE:

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

#### ACCESSORIES:

- JV 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)
- TYPE:  IPS Steel (Mechanically  
 Expanded)
- LENGTHS: 2'0" thru 12'6" in 1" Increments  
 NPT Thread both Ends (Std)  
 Beveled Ends for Field Weld (Opt'l)

See Catalog for Working  
 Pressures

### JVB Slip Jointed Enclosure

#### 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:

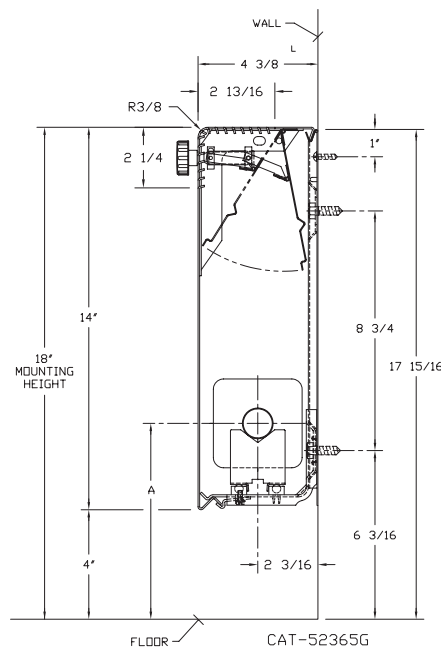
- Water Brkt w/B.B.  
 Steam Brkt w/Brkt Mtd  
 B.B. Hgr

#### DAMPER:

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

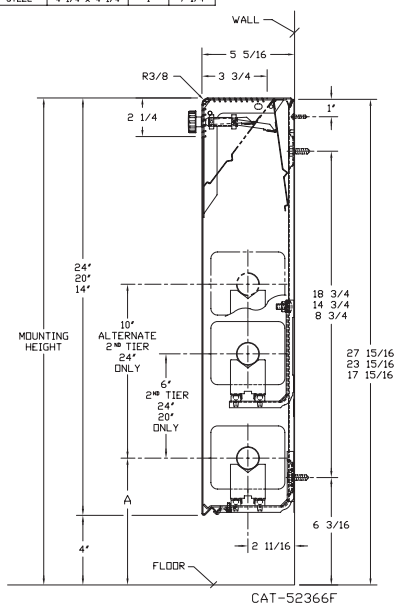
### JVA-RD14

ELEMENT TUBE SIZE	FIN SIZE HEIGHT x WIDTH	GRABLE NUMBER	A
3/4 COPPER	3 1/4 x 3 1/4	2	7"
1" COPPER	3 1/4 x 3 1/4	2	7 3/16
1 1/4 COPPER	3 1/4 x 3 1/4	1	6 5/8
1" STEEL	3 1/4 x 3 1/4	2	7 5/16
1 1/4 STEEL	3 1/4 x 3 1/4	1	6 13/16



### JVB-RD14 20 24

ELEMENT TUBE SIZE	FIN SIZE HEIGHT x WIDTH	GRABLE 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



260 North Elm St., Westfield, MA 01085  
 (413) 564-5535 Fax: (413) 562-8437  
 www.sterlingheat.com



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



# STYLE "JVA-RD / JVB-RD" VERSA-LINE

## COPPER/ALUMINUM ELEMENTS

ALL RATINGS ARE IN BTU/HR/LIN FT AND BASED ON 3 FPS VELOCITY, 65° EAT

TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FINS PER FT.	FIN THICKNESS IN INCHES	ENCL DEPTH AND HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MOUNTING HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)																		
									200°	190°	180°	170°	160°	150°	140°	130°	120°	CORRECTION FACTORS FOR AVERAGE WATER TEMPERATURES									
									1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26									
3/4"	C3/4-43	4-1/4" SQ.	32	.020	14B	1	18	1520	1310	1190	1050	930	810	680	610	500	400										
					20B	1	24	1615	1390	1260	1110	990	860	730	650	530	420										
					20B	2-6 CL	24	2345	2020	1830	1620	1430	1240	1060	940	770	610										
					24B	1	28	1685	1450	1310	1160	1030	890	760	670	560	440										
					24B	2-6 CL	28	2435	2090	1900	1680	1490	1290	1100	970	800	630										
24B	3-6 CL	28	2800	2410	2180	1930	1710	1480	1260	1120	920	730															
3/4"	C3/4-44	4-1/4" SQ.	40	.020	14B	1	18	2100	1810	1640	1450	1280	1110	950	840	690	550										
					20B	1	24	2250	1940	1760	1550	1370	1190	1010	900	740	590										
					20B	2-6 CL	24	3180	2730	2480	2190	1940	1690	1430	1270	1050	830										
					24B	1	28	2350	2020	1830	1620	1430	1250	1060	940	780	610										
					24B	2-6 CL	28	3270	2810	2550	2260	1990	1730	1470	1310	1080	850										
24B	3-6 CL	28	3730	3210	2910	2570	2280	1980	1680	1490	1230	970															
3/4"	C3/4-45	4-1/4" SQ.	50	.020	14B	1	18	2210	1900	1720	1520	1350	1170	990	880	730	570										
					20B	1	24	2420	2080	1890	1670	1480	1280	1090	970	800	630										
					20B	2-6 CL	24	3200	2750	2500	2210	1950	1700	1440	1280	1060	830										
					24B	1	28	2550	2190	1990	1760	1560	1350	1150	1020	840	660										
					24B	2-6 CL	28	3380	2910	2640	2330	2060	1790	1520	1350	1120	880										
24B	3-6 CL	28	3820	3290	2980	2640	2330	2020	1720	1530	1260	990															
1"	C43	4-1/4" SQ.	32	.020	14B	1	18	1710	1470	1330	1180	1040	910	770	680	560	440										
					20B	1	24	1760	1510	1370	1210	1070	930	790	700	580	460										
					20B	2-6 CL	24	2720	2340	2120	1880	1660	1440	1220	1090	900	710										
					24B	1	28	1810	1560	1410	1250	1100	960	810	720	600	470										
					24B	2-6 CL	28	2810	2420	2190	1940	1710	1490	1260	1120	930	730										
24B	3-6 CL	28	3230	2780	2520	2230	1970	1710	1450	1290	1070	840															
1"	C44	4-1/4" SQ.	40	.020	14B	1	18	1940	1670	1510	1340	1180	1030	870	780	640	500										
					20B	1	24	2070	1780	1610	1430	1260	1100	930	830	680	540										
					20B	2-6 CL	24	2850	2450	2220	1970	1740	1510	1280	1140	940	740										
					24B	1	28	2140	1840	1670	1480	1310	1130	960	860	710	560										
					24B	2-6 CL	28	2990	2570	2330	2060	1820	1580	1350	1200	990	780										
24B	3-6 CL	28	3410	2930	2660	2350	2080	1810	1530	1360	1130	890															
1"	C45	4-1/4" SQ.	50	.020	14B	1	18	2220	1910	1730	1530	1350	1180	1000	890	730	580										
					20B	1	24	2430	2090	1900	1680	1480	1290	1090	970	800	630										
					20B	2-6 CL	24	3030	2610	2360	2090	1850	1610	1360	1210	1000	790										
					24B	1	28	2550	2190	1990	1760	1560	1350	1150	1020	840	660										
					24B	2-6 CL	28	3250	2800	2540	2240	1980	1720	1460	1300	1070	850										
24B	3-6 CL	28	3670	3160	2860	2530	2240	1950	1650	1470	1210	950															
1-1/4"	C143	4-1/4" SQ.	32	.020	14B	1	18	1700	1460	1330	1170	1040	900	770	680	560	440										
					20B	1	24	1740	1500	1360	1200	1060	920	780	700	570	450										
					20B	2-6 CL	24	2670	2300	2080	1840	1630	1420	1200	1070	880	690										
					24B	1	28	1780	1530	1390	1230	1090	940	800	710	590	460										
					24B	2-6 CL	28	2720	2340	2120	1880	1660	1440	1220	1090	900	710										
24B	3-6 CL	28	3130	2690	2440	2160	1910	1660	1410	1250	1030	810															
1-1/4"	C144	4-1/4" SQ.	40	.020	14B	1	18	1950	1680	1520	1350	1190	1030	880	780	640	510										
					20B	1	24	2090	1800	1630	1440	1270	1110	940	840	690	540										
					20B	2-6 CL	24	2810	2420	2190	1940	1710	1490	1260	1120	930	730										
					24B	1	28	2160	1860	1680	1490	1320	1140	970	860	710	560										
					24B	2-6 CL	28	2940	2530	2290	2030	1790	1560	1320	1180	970	760										
24B	3-6 CL	28	3350	2880	2610	2310	2040	1780	1510	1340	1110	870															
1-1/4"	C145	4-1/4" SQ.	50	.020	14B	1	18	2100	1810	1640	1450	1280	1110	950	840	690	550										
					20B	1	24	2300	1980	1790	1590	1400	1220	1040	920	760	600										
					20B	2-6 CL	24	2940	2530	2290	2030	1790	1560	1320	1180	970	760										
					24B	1	28	2380	2050	1860	1640	1450	1260	1070	950	790	620										
					24B	2-6 CL	28	3060	2630	2390	2110	1870	1620	1380	1220	1010	800										
24B	3-6 CL	28	3460	2980	2700	2390	2110	1830	1560	1380	1140	900															

Note: Copper tube furnished flared one end standard.

# STYLE "JVA-RD / JVB-RD" VERSA-LINE

## STEEL ELEMENTS

ALL RATINGS ARE IN BTU/HR/LIN FT AND BASED ON 3 FPS VELOCITY, 65° EAT

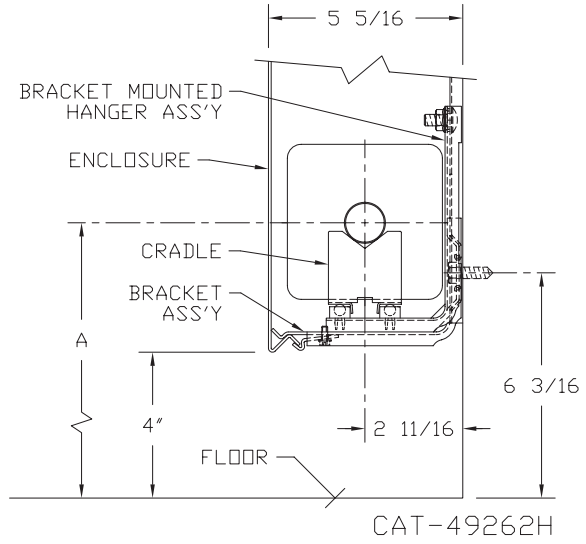
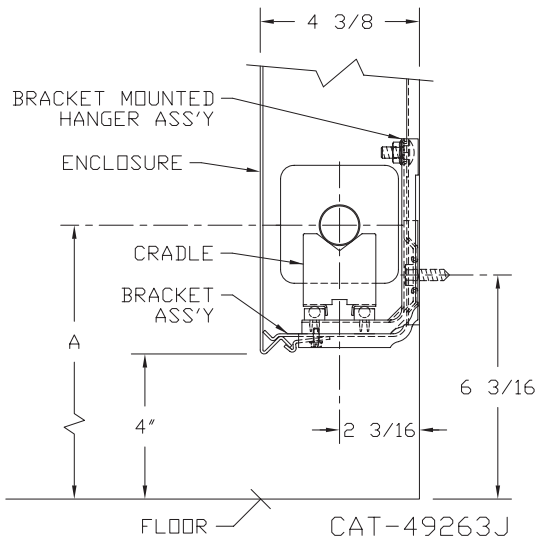
TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FINS PER FT.	FIN THICKNESS IN INCHES	ENCL DEPTH AND HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MOUNTING HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)									
									200°	190°	180°	170°	160°	150°	140°	130°	120°	
									CORRECTION FACTORS FOR AVERAGE WATER TEMPERATURES									
									1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1"	S33	3-1/4" SQ.	32	.032	14A	1	18	1000	860	780	690	610	530	450	400	330	260	
1"	S34	3-1/4" SQ.	40	.032	14A	1	18	1100	950	860	760	670	580	500	440	360	290	
1"	S35	3-1/4" SQ.	50	.032	14A	1	18	1170	1010	910	810	710	620	530	470	390	300	
1-1/4"	S133	3-1/4" SQ.	32	.032	14A	1	18	990	850	770	680	600	520	450	400	330	260	
1-1/4"	S134	3-1/4" SQ.	40	.032	14A	1	18	1120	960	870	770	680	590	500	450	370	290	
1-1/4"	S135	3-1/4" SQ.	50	.032	14A	1	18	1150	990	900	790	700	610	520	460	380	300	
1"	S43	4-1/4" SQ.	32	.032	14B	1	18	1430	1230	1120	990	870	760	640	570	470	370	
					20B	1	24	1480	1270	1150	1020	900	780	670	590	490	380	
					20B	2-6 CL	24	2215	1900	1730	1530	1350	1170	1000	890	730	580	
					24B	1	28	1520	1310	1190	1050	930	810	680	610	500	400	
					24B	2-6 CL	28	2255	1940	1760	1560	1380	1200	1010	900	740	590	
1"	S44	4-1/4" SQ.	40	.032	14B	1	18	1605	1380	1250	1110	980	850	720	640	530	420	
					20B	1	24	1705	1470	1330	1180	1040	900	770	680	560	440	
					20B	2-6 CL	24	2395	2060	1870	1650	1460	1270	1080	960	790	620	
					24B	1	28	1765	1520	1380	1220	1080	940	790	710	580	460	
					24B	2-6 CL	28	2470	2120	1930	1700	1510	1310	1110	990	820	640	
1"	S45	4-1/4" SQ.	50	.032	14B	1	18	1680	1440	1310	1160	1020	890	760	670	550	440	
					20B	1	24	1785	1540	1390	1230	1090	950	800	710	590	460	
					20B	2-6 CL	24	2455	2110	1910	1690	1500	1300	1100	980	810	640	
					24B	1	28	1850	1590	1440	1280	1130	980	830	740	610	480	
					24B	2-6 CL	28	2535	2180	1980	1750	1550	1340	1140	1010	840	660	
1-1/4"	S143	4-1/4" SQ.	32	.032	14B	1	18	1300	1120	1010	900	790	690	590	520	430	340	
					20B	1	24	1310	1130	1020	900	800	690	590	520	430	340	
					20B	2-6 CL	24	2070	1780	1610	1430	1260	1100	930	830	680	540	
					24B	1	28	1320	1140	1030	910	810	700	590	530	440	340	
					24B	2-6 CL	28	2120	1820	1650	1460	1290	1120	950	850	700	550	
1-1/4"	S144	4-1/4" SQ.	40	.032	14B	1	18	1540	1320	1200	1060	940	820	690	620	510	400	
					20B	1	24	1620	1390	1260	1120	990	860	730	650	530	420	
					20B	2-6 CL	24	2400	2060	1870	1660	1460	1270	1080	960	790	620	
					24B	1	28	1680	1440	1310	1160	1020	890	760	670	550	440	
					24B	2-6 CL	28	2510	2160	1960	1730	1530	1330	1130	1000	830	650	
1-1/4"	S145	4-1/4" SQ.	50	.032	14B	1	18	1670	1440	1300	1150	1020	890	750	670	550	430	
					20B	1	24	1775	1530	1380	1220	1080	940	800	710	590	460	
					20B	2-6 CL	24	2405	2070	1880	1660	1470	1270	1080	960	790	630	
					24B	1	28	1835	1580	1430	1270	1120	970	830	730	610	480	
					24B	2-6 CL	28	2485	2140	1940	1710	1520	1320	1120	990	820	650	
2"	S242	4-1/4" SQ.	25	.032	14B	1	18	1230	1060	960	850	750	650	550	490	410	320	
					20B	1	24	1240	1070	970	860	760	660	560	500	410	320	
					20B	2-6 CL	24	1940	1670	1510	1340	1180	1030	870	780	640	500	
					24B	1	28	1250	1080	980	860	760	660	560	500	410	330	
					24B	2-6 CL	28	2000	1720	1560	1380	1220	1060	900	800	660	520	
2"	S243	4-1/4" SQ.	32	.032	14B	1	18	1420	1220	1110	980	870	750	640	570	470	370	
					20B	1	24	1460	1260	1140	1010	890	770	660	580	480	380	
					20B	2-6 CL	24	2140	1840	1670	1480	1310	1130	960	860	710	560	
					24B	1	28	1480	1270	1150	1020	900	780	670	590	490	380	
					24B	2-6 CL	28	2220	1910	1730	1530	1350	1180	1000	890	730	580	
24B	3-6 CL	28	2550	2190	1990	1760	1560	1350	1150	1020	840	660						

- Notes: 1) Steel fins furnished as .032 thick, painted black.  
 2) NPT threads furnished on steel elements. Please use domestic fittings for proper installation.  
 3) The ends can be provided chamfered for field welded fittings when specified.

## Steam Bracket and BB Hanger

ELEMENT TUBE SIZE	FIN SIZE HEIGHT x WIDTH	CRADLE NUMBER	A MIN	A MAX
3/4 COPPER	3 1/4 x 3 1/4	2	7 3/8	9 5/8
1" COPPER	3 1/4 x 3 1/4	2	7 1/2	9 3/4
1 1/4 COPPER	3 1/4 x 3 1/4	2	7 5/8	9 7/8
1" STEEL	3 1/4 x 3 1/4	2	7 5/8	9 3/4
1 1/4 STEEL	3 1/4 x 3 1/4	1	7 3/16	9 3/8

ELEMENT TUBE SIZE	FIN SIZE HEIGHT x WIDTH	CRADLE NUMBER	A MIN	A MAX
3/4 COPPER	3 5/8 x 4 1/4	2	7 3/8	8 3/4
	4 1/4 x 4 1/4	3A	7 11/16	9 1/16
1" COPPER	3 5/8 x 4 1/4	2	7 1/2	8 7/8
	4 1/4 x 4 1/4			
1 1/4 COPPER	3 5/8 x 4 1/4	2	7 5/8	9"
	4 1/4 x 4 1/4			
1" STEEL	4 1/4 x 4 1/4	2	7 5/8	9"
1 1/4 STEEL	4 1/4 x 4 1/4	2	7 7/8	9 1/4
2" STEEL	4 1/4 x 4 1/4	1	7 5/8	9"



# Design Data

## COMMERCIAL FINNED TUBE CHARTS FOR RATING CORRECTIONS

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

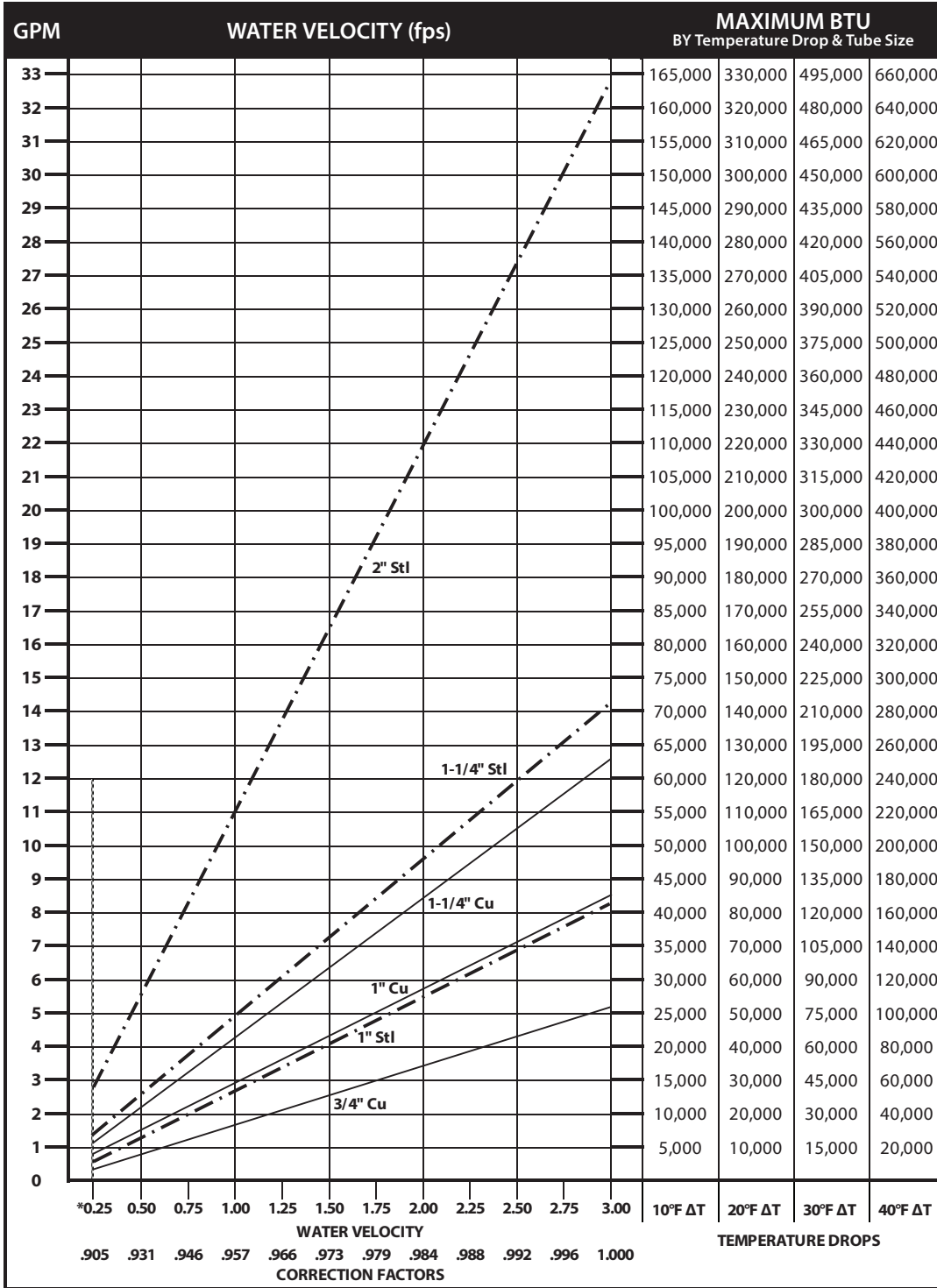
CORRECTION FACTORS FOR WATER TEMPERATURES AND AIR TEMPERATURES OTHER THAN STANDARD															
AVERAGE WATER TEMP. °F	ENTERING AIR TEMPERATURE °F														
	45	55	STD 65	70	75	80	85	90	95	100	110	120	130	140	150
90	.19	.13	.11	.06											
100	.25	.19	.15	.11	.08	.06									
110	.31	.25	.20	.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		ENTERING AIR TEMPERATURE °F														
PRESSURE		TEMP. °F	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"	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"	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 ½" drop over 20-foot run.

# Design Data



## DYNAMIC FORMULAS

$$BTU = GPM \times 500 \times TD$$

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

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

\*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

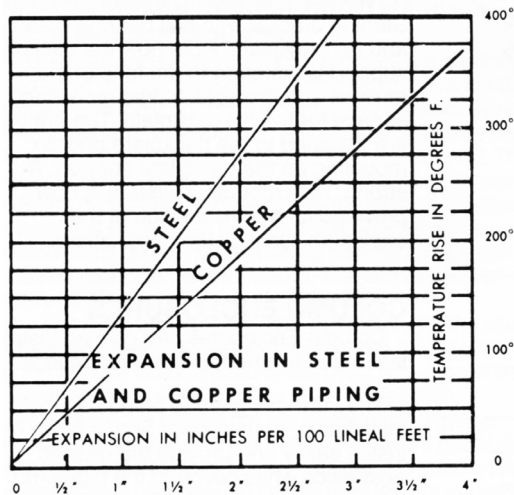
## GUARANTEED WORKING PRESSURES

- 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

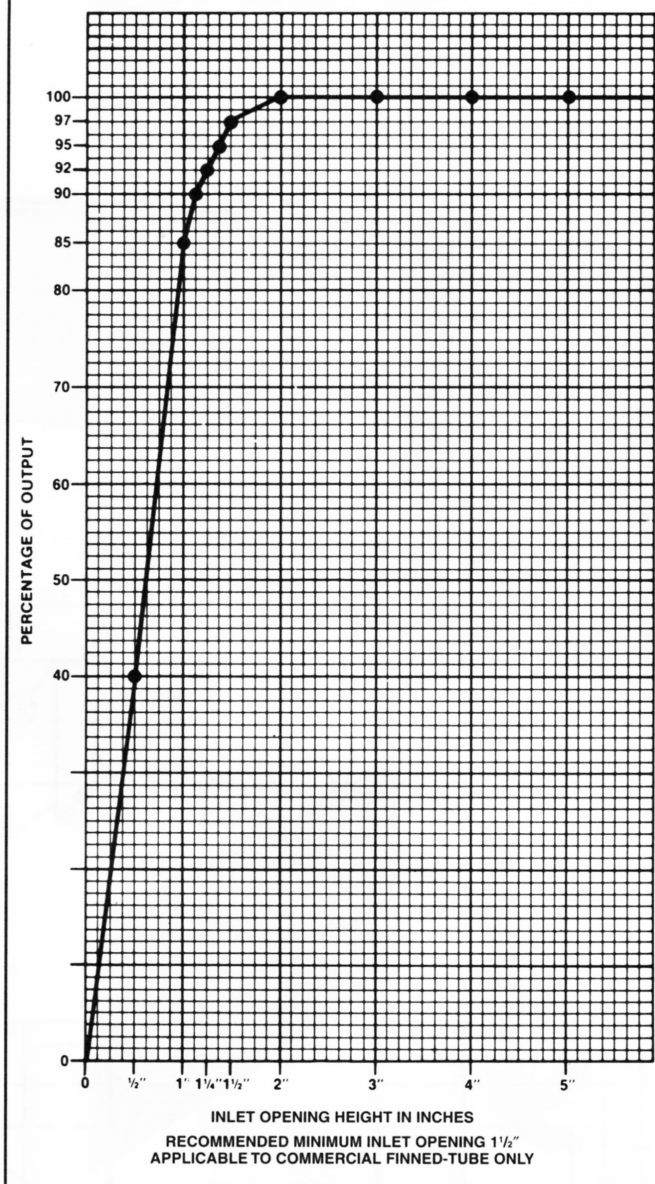
#### Fluid Temperature 180°F

% 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