

VERSA-LINE

Submittal

Bare Element "A"
Versa-Line
Copper/Aluminum and
Steel Element Ratings

Bare Element "A"

Specification

ELEMENT:

TYPE: Cu/AL (Mechanically Expanded)
LENGTHS: 2'0" thru 12'6" in 1" Increments
for 1" & 1-1/4" Cu.
2'0" to 8'0" in 1" Increments
for 3/4" Cu.

One End Flared (Std)

See Catalog for Working
Pressures

BRACKETS:

Wall Mtd B.B. Hngr

ELEMENT:

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

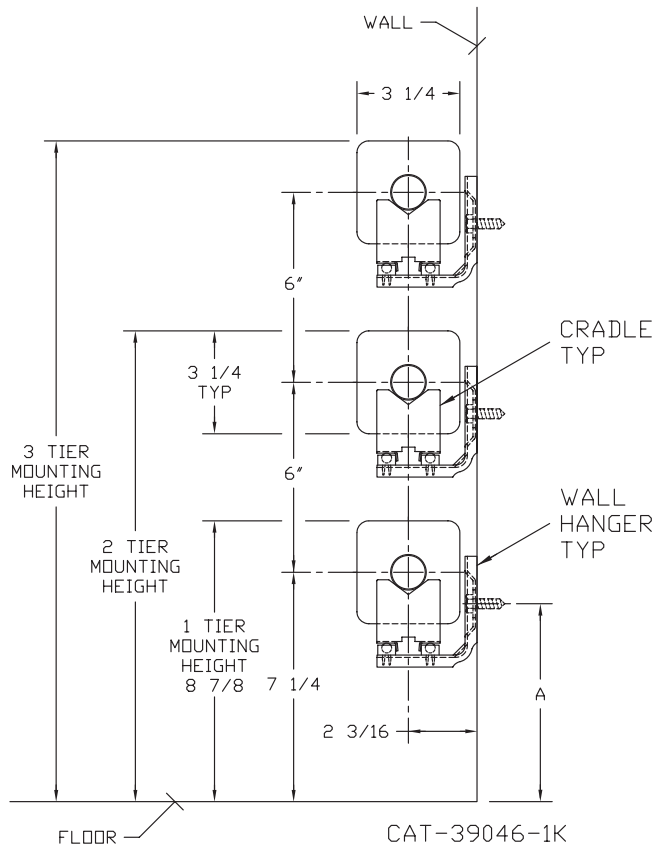
See Catalog for Working
Pressures

BRACKETS:

Wall Mtd B.B. Hngr

Bare Element "A" 3-1/4" Wide Fin B.B. Hanger Wall "A"

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



COMMERCIAL HYDRONIC PRODUCTS

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

www.sterlingheat.com



10/22

PROJECT: _____ DATE: _____

LOCATION: _____

ARCHITECT: _____

ENGINEER: _____

CONTRACTOR: _____

PO NUMBER: _____

STYLE "A" BARE ELEMENT

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	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								
3/4"	C3/4-33	3-1/4" SQ.	32	.020	1	8-7/8	970	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1720	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2410	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
3/4"	C3/4-34	3-1/4" SQ.	40	.020	1	8-7/8	1140	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1880	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2570	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
3/4"	C3/4-35	3-1/4" SQ.	50	.020	1	8-7/8	1260	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	2010	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2690	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1"	C33	3-1/4" SQ.	32	.020	1	8-7/8	970	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1720	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2370	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1"	C34	3-1/4" SQ.	40	.020	1	8-7/8	1080	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1850	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2490	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1"	C35	3-1/4" SQ.	50	.020	1	8-7/8	1210	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1940	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2600	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1-1/4"	C133	3-1/4" SQ.	32	.020	1	8-7/8	970	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1680	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2360	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1-1/4"	C134	3-1/4" SQ.	40	.020	1	8-7/8	1060	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1840	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2450	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1-1/4"	C135	3-1/4" SQ.	50	.020	1	8-7/8	1170	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1900	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2550	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26

Note: Copper tube furnished flared one end standard.

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	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"	S33	3-1/4" SQ.	32	.032	1	8-7/8	910	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1580	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2200	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1"	S34	3-1/4" SQ.	40	.032	1	8-7/8	990	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1700	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2350	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1"	S35	3-1/4" SQ.	50	.032	1	8-7/8	1060	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1790	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2450	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1-1/4"	S133	3-1/4" SQ.	32	.032	1	8-7/8	900	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1620	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2240	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1-1/4"	S134	3-1/4" SQ.	40	.032	1	8-7/8	1000	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1700	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2250	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1-1/4"	S135	3-1/4" SQ.	50	.032	1	8-7/8	1030	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					2-6 CL	14-7/8	1750	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
					3-6 CL	20-7/8	2280	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26

- 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.

Design Data

COMMERCIAL FINNED TUBE CHARTS FOR RATING CORRECTIONS

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

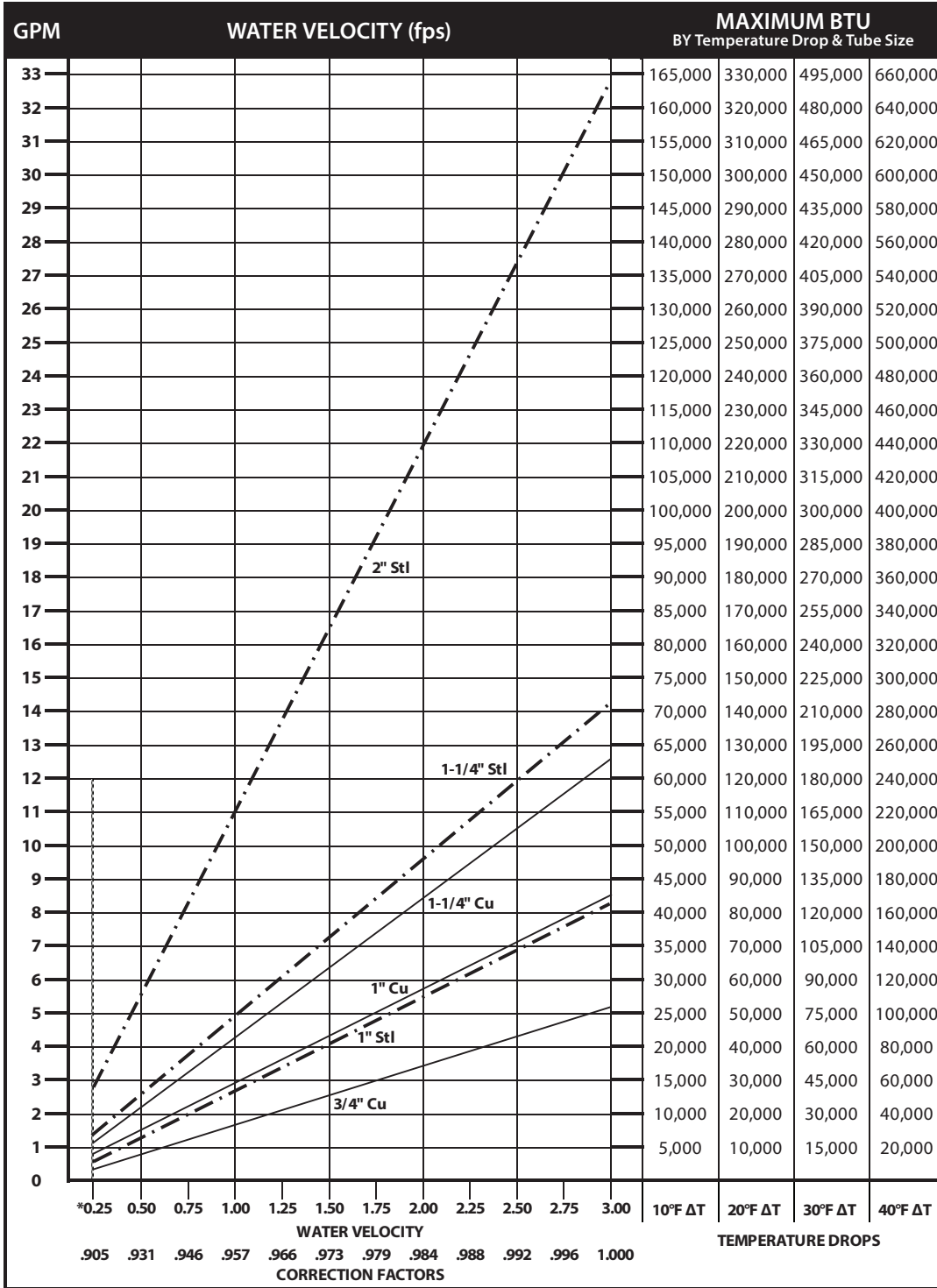
CORRECTION FACTORS FOR WATER TEMPERATURES AND AIR TEMPERATURES OTHER THAN STANDARD															
AVERAGE WATER TEMP. °F	ENTERING AIR TEMPERATURE °F														
	45	55	STD 65	70	75	80	85	90	95	100	110	120	130	140	150
90	.19	.13	.11	.06											
100	.25	.19	.15	.11	.08	.06									
110	.31	.25	.20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

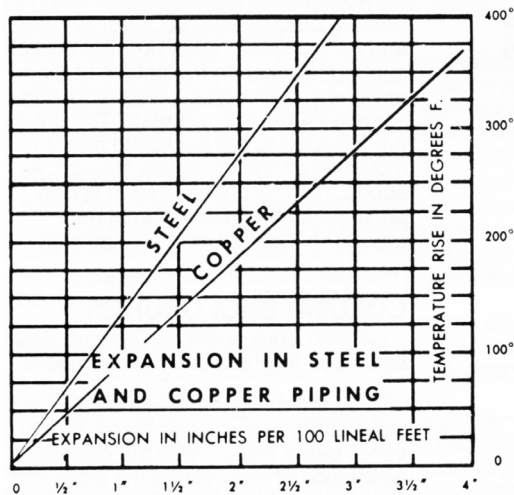
GUARANTEED WORKING PRESSURES

- 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

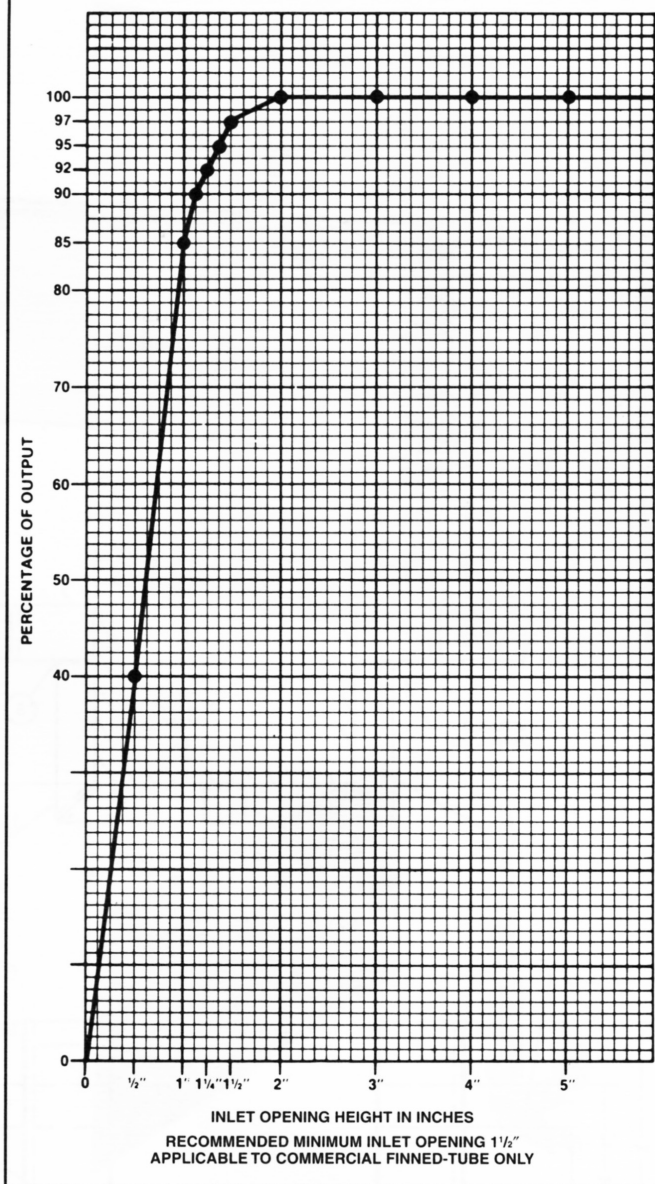
Fluid Temperature 180°F

% 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