DURA-VANE II

Submittal

JDV3 10LI / JDV4 10LI
Dura-Vane II Architectural Copper/Aluminum and Steel Elements

☐ **JDV3 Slip Jointed Enclosure**

Specification

☐ **JDV4 Slip Jointed**

ENCLOSURE:

STYLE: Dura-Vane Front Louvered Inlet
OUTLET: Extruded Aluminum
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: 10"
FINISH ☐ Baked Powder (Std)
☐ Baked Metallic (Opt'l)

FLOOR ANGLE:

☐ Ext. Al (Clear Anodized)

ACCESSORIES:

☐ JDV Overlapping Type

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

See Catalog for Working Pressures

BACKPLATE:

TYPE: ☐ Partial B/P
LENGTHS: 8'0" Only
MAT'L: ☐ 20 Ga. Prepainted (Std)
☐ 18 Ga. Galvannealed (Opt'l)

☐ Full Ht. B/P (Opt'l)
2' thru 8' in 6" increments
☐ 20 Ga. Galvannealed (Opt'l)
☐ 20 Ga. Painted (Opt'l)
☐ 18 Ga. Painted (Opt'l)

AIRSEAL:

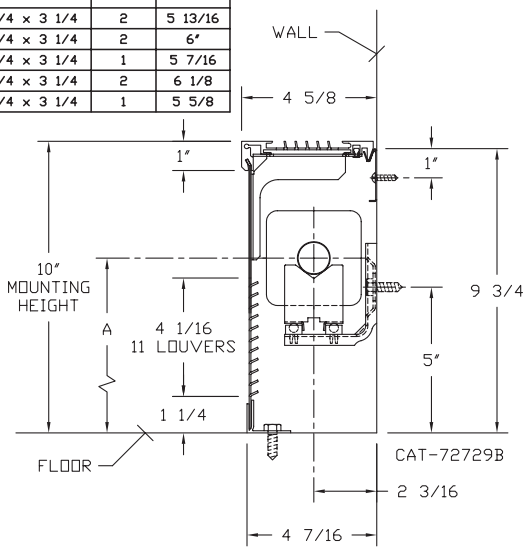
☐ 1/8" x 3/8" Closed Cell (Opt'l)

BRACKETS:

☐ B.B. Hgr. Wall Mtd. 3
☐ B.B. Hgr. Wall Mtd. 4

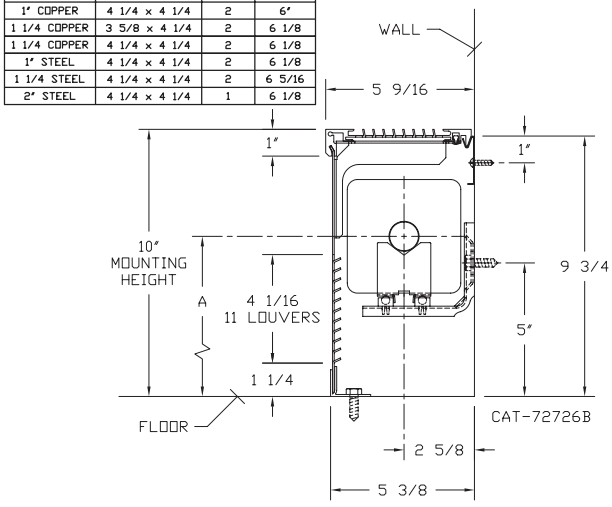
☐ JDV3 10LI

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



☐ JDV4 10LI

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



Vulcan RADIATOR
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(413) 568-9571 Fax: (413) 564-5661
www.vulcanrad.com

MADE IN THE USA

6/2022

PROJECT: _____ **DATE:** _____
LOCATION: _____
ARCHITECT: _____
ENGINEER: _____
CONTRACTOR: _____
PO NUMBER: _____

STYLES JDV3 & JDV4 10LI DURA-VANE II LOUVERED INLET

COPPER/ALUMINUM ELEMENT RATINGS ALL RATINGS ARE BASED ON 3 FPS VELOCITY, 65° EAT					ENCL HEIGHT IN INCHES	ENCL DEPTH IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)								
									200°	190°	180°	170°	160°	150°	140°	130°	120°
TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FIN PER FT.	FIN THICKNESS IN INCHES					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″	VC3/4-33	3-1/4″ SQ.	32	.020	10	4-5/8	10	780	670	610	540	480	410	350	310	260	200
3/4″	VC3/4-34	3-1/4″ SQ.	40	.020	10	4-5/8	10	950	820	740	660	580	500	430	380	310	250
3/4″	VC3/4-35	3-1/4″ SQ.	50	.020	10	4-5/8	10	960	830	750	660	590	510	430	380	320	250
1″	VC33	3-1/4″ SQ.	32	.020	10	4-5/8	10	800	690	620	550	490	420	360	320	260	210
1″	VC34	3-1/4″ SQ.	40	.020	10	4-5/8	10	920	790	720	630	560	490	410	370	300	240
1″	VC35	3-1/4″ SQ.	50	.020	10	4-5/8	10	930	800	730	640	570	490	420	370	310	240
1 1/4″	VC133	3-1/4″ SQ.	32	.020	10	4-5/8	10	770	660	600	530	470	410	350	310	250	200
1 1/4″	VC134	3-1/4″ SQ.	40	.020	10	4-5/8	10	880	760	690	610	540	470	400	350	290	230
1 1/4″	VC135	3-1/4″ SQ.	50	.020	10	4-5/8	10	890	770	690	610	540	470	400	360	290	230
3/4″	VC3/4-433	3-5/8″ x 4-1/4″	32	.020	10	5-9/16	10	1020	880	800	700	620	540	460	410	340	270
3/4″	VC3/4-434	3-5/8″ x 4-1/4″	40	.020	10	5-9/16	10	1180	1010	920	810	720	630	530	470	390	310
3/4″	VC3/4-435	3-5/8″ x 4-1/4″	50	.020	10	5-9/16	10	1255	1080	980	870	770	670	560	500	410	330
1″	VC433	3-5/8″ x 4-1/4″	32	.020	10	5-9/16	10	1090	940	850	750	660	580	490	440	360	280
1″	VC434	3-5/8″ x 4-1/4″	40	.020	10	5-9/16	10	1200	1030	940	830	730	640	540	480	400	310
1″	VC435	3-5/8″ x 4-1/4″	50	.020	10	5-9/16	10	1290	1110	1010	890	790	680	580	520	430	340
1-1/4″	VC1433	3-5/8″ x 4-1/4″	32	.020	10	5-9/16	10	1070	920	830	740	650	570	480	430	350	280
1-1/4″	VC1434	3-5/8″ x 4-1/4″	40	.020	10	5-9/16	10	1180	1010	920	810	720	630	530	470	390	310
1-1/4″	VC1435	3-5/8″ x 4-1/4″	50	.020	10	5-9/16	10	1270	1090	990	880	770	670	570	510	420	330
3/4″	VC3/4-43	4-1/4″ SQ.	32	.020	10	5-9/16	10	1190	1020	930	820	730	630	540	480	390	310
3/4″	VC3/4-44	4-1/4″ SQ.	40	.020	10	5-9/16	10	1290	1110	1010	890	790	680	580	520	430	340
3/4″	VC3/4-45	4-1/4″ SQ.	50	.020	10	5-9/16	10	1310	1130	1020	900	800	690	590	520	430	340
1″	VC43	4-1/4″ SQ.	32	.020	10	5-9/16	10	1200	1030	940	830	730	640	540	480	400	310
1″	VC44	4-1/4″ SQ.	40	.020	10	5-9/16	10	1320	1140	1030	910	810	700	590	530	440	340
1″	VC45	4-1/4″ SQ.	50	.020	10	5-9/16	10	1340	1150	1050	920	820	710	600	540	440	350
1-1/4″	VC143	4-1/4″ SQ.	32	.020	10	5-9/16	10	1170	1010	910	810	710	620	530	470	390	300
1-1/4″	VC144	4-1/4″ SQ.	40	.020	10	5-9/16	10	1300	1120	1010	900	790	690	590	520	430	340
1-1/4″	VC145	4-1/4″ SQ.	50	.020	10	5-9/16	10	1320	1140	1030	910	810	700	590	530	440	340

Copper tube furnished flared one end standard.

STEEL ELEMENT RATINGS ALL RATINGS ARE BASED ON 3 FPS VELOCITY, 65° EAT					ENCL HEIGHT IN INCHES	ENCL DEPTH IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)								
									200°	190°	180°	170°	160°	150°	140°	130°	120°
TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FIN PER FT.	FIN THICKNESS IN INCHES					CORRECTION FACTORS FOR AVERAGE WATER TEMPERATURES								
								1.00	0.86	0.78	0.69	0.61	0.53	0.45	.40	.33	.26
1″	VS33	3-1/4″ SQ.	32	.032	10	4-5/8	10	740	640	580	510	450	390	330	300	240	190
1″	VS34	3-1/4″ SQ.	40	.032	10	4-5/8	10	815	700	640	560	500	430	370	330	270	210
1″	VS35	3-1/4″ SQ.	50	.032	10	4-5/8	10	855	740	670	590	520	450	380	340	280	220
1-1/4″	VS133	3-1/4″ SQ.	32	.032	10	4-5/8	10	730	630	570	500	450	390	330	290	240	190
1-1/4″	VS134	3-1/4″ SQ.	40	.032	10	4-5/8	10	825	710	640	570	500	440	370	330	270	210
1-1/4″	VS135	3-1/4″ SQ.	50	.032	10	4-5/8	10	840	720	660	580	510	450	380	340	280	220
1″	VS43	4-1/4″ SQ.	32	.032	10	5-9/16	10	1045	900	820	720	640	550	470	420	340	270
1″	VS44	4-1/4″ SQ.	40	.032	10	5-9/16	10	1140	980	890	790	700	600	510	460	380	300
1″	VS45	4-1/4″ SQ.	50	.032	10	5-9/16	10	1225	1050	960	850	750	650	550	490	400	320
1-1/4″	VS143	4-1/4″ SQ.	32	.032	10	5-9/16	10	960	830	750	660	590	510	430	380	320	250
1-1/4″	VS144	4-1/4″ SQ.	40	.032	10	5-9/16	10	1150	990	900	790	700	610	520	460	380	300
1-1/4″	VS145	4-1/4″ SQ.	50	.032	10	5-9/16	10	1210	1040	940	830	740	640	540	480	400	310
2″	VS242	4-1/4″ SQ.	25	.032	10	5-9/16	10	905	780	710	620	550	480	410	360	300	240
2″	VS243	4-1/4″ SQ.	32	.032	10	5-9/16	10	1075	920	840	740	660	570	480	430	350	280

NPT threads furnished on steel elements. Please use domestic fittings for proper installation.

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

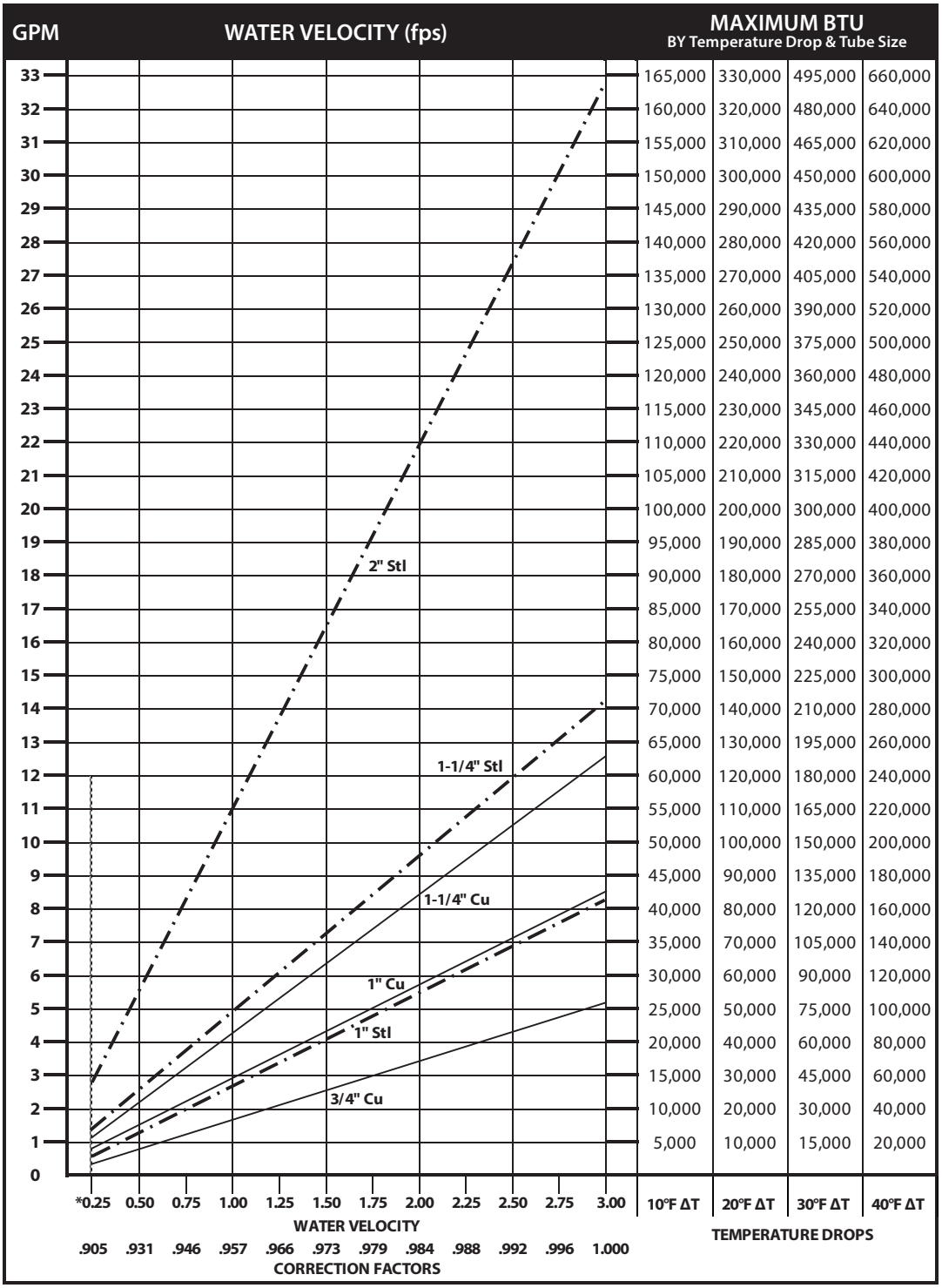
CORRECTION FACTORS FOR STEAM PRESSURES AND AIR TEMPERATURES OTHER THAN STANDARD

STEAM PRESSURE		TEMP. °F	ENTERING AIR TEMPERATURE °F												
GAUGE	ABS. PSI		45	55	STD 65	70	75	80	85	90	100	110	120	130	140	150
(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



GPM	10°F ΔT	20°F ΔT	30°F ΔT	40°F ΔT
33	165,000	330,000	495,000	660,000
32	160,000	320,000	480,000	640,000
31	155,000	310,000	465,000	620,000
30	150,000	300,000	450,000	600,000
29	145,000	290,000	435,000	580,000
28	140,000	280,000	420,000	560,000
27	135,000	270,000	405,000	540,000
26	130,000	260,000	390,000	520,000
25	125,000	250,000	375,000	500,000
24	120,000	240,000	360,000	480,000
23	115,000	230,000	345,000	460,000
22	110,000	220,000	330,000	440,000
21	105,000	210,000	315,000	420,000
20	100,000	200,000	300,000	400,000
19	95,000	190,000	285,000	380,000
18	90,000	180,000	270,000	360,000
17	85,000	170,000	255,000	340,000
16	80,000	160,000	240,000	320,000
15	75,000	150,000	225,000	300,000
14	70,000	140,000	210,000	280,000
13	65,000	130,000	195,000	260,000
12	60,000	120,000	180,000	240,000
11	55,000	110,000	165,000	220,000
10	50,000	100,000	150,000	200,000
9	45,000	90,000	135,000	180,000
8	40,000	80,000	120,000	160,000
7	35,000	70,000	105,000	140,000
6	30,000	60,000	90,000	120,000
5	25,000	50,000	75,000	100,000
4	20,000	40,000	60,000	80,000
3	15,000	30,000	45,000	60,000
2	10,000	20,000	30,000	40,000
1	5,000	10,000	15,000	20,000
0				

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

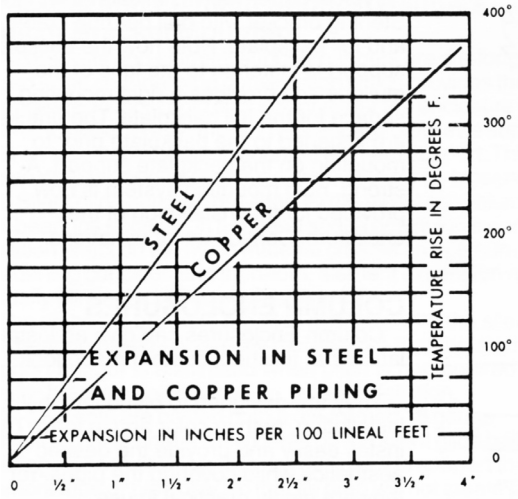
GUARANTEED WORKING PRESSURES

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

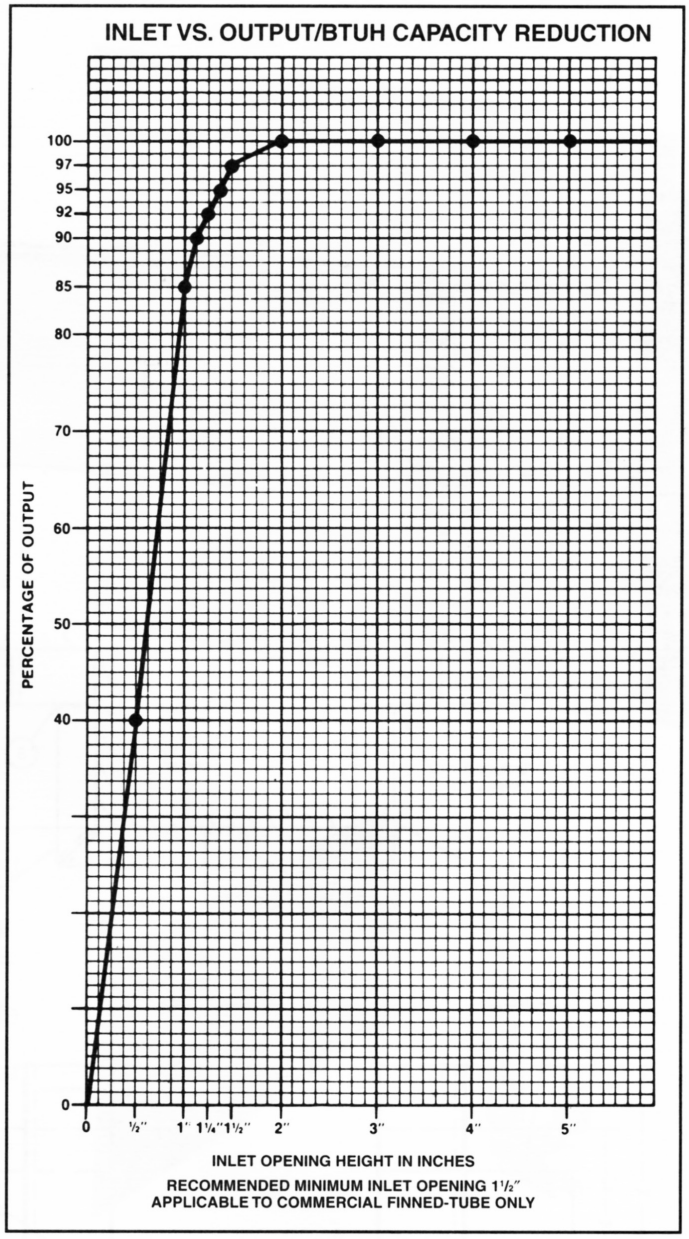
% Solution	Ethylene Glycol	Propylene Glycol
20	.952	.988
30	.921	.968
40	.888	.943
50	.852	.912

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



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