

DURA-VANE II

Submittal

JDV3 14 20 & 24
Dura-Vane II Architectural
Copper/Aluminum and
Steel Elements

JDV3 Slip Jointed Enclosure

Specification

ENCLOSURE:

- STYLE: Dura-Vane II
 OUTLET: Extruded Aluminum Grille
 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: 14"
 20"
 24"
- FINISH Baked Powder (Std)
 Baked Metallic (Opt'l)

ACCESSORIES:

- JDV3 Overlapping Type
 All accessories have finger tabs at the bottom
 for easy installation.

ELEMENT:

- TYPE: Cu/Al (Mechanically
 Expanded)
- LENGTHS: 2'0" thru 12'6" in 1" Increments
 for 1" & 1-1/4" Cu.
 2' thru 8' 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 (Opt'l)
 18 Ga. Galvannealed (Opt'l)
- Full Ht. B/P (Opt'l)
 2'0" thru 8'0" 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:

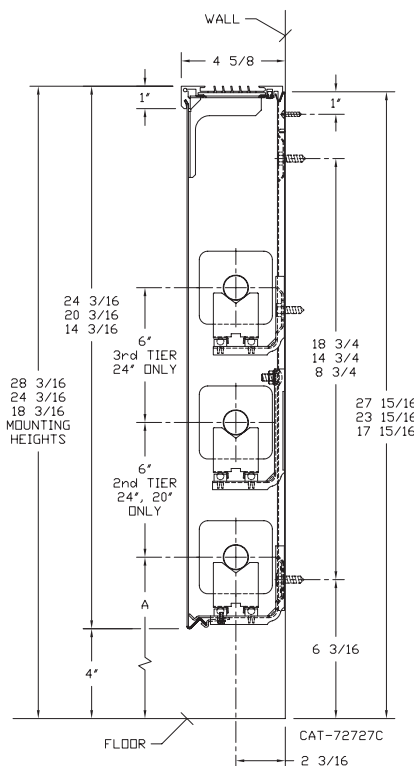
- Water Brkt w/B.B.
 Steam Brkt w/Brkt Mtd
 B.B. Hgr, Bracket Mtd
 B.B. Hgr, Wall Mtd
 Wall Mtd B.B. Hgr required
 for 3rd Tier Element

JDV3 24

JDV3 20

JDV3 14

ELEMENT TUBE SIZE	FIN SIZE HEIGHT x WIDTH	CRADLE 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"



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



1/2024

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

STYLES JDV3 14 20 & 24 DURA-VANE II

COPPER/ALUMINUM ELEMENT RATINGS ALL RATINGS ARE BASED ON 3 FPS VELOCITY, 65° EAT					ENCL HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)								
TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FIN PER FT.	FIN THICKNESS IN INCHES					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"	VC3/4-33	3-1/4" SQ.	32	.020	14-3/16	1	18-3/16	1050	900	820	720	640	560	470	420	350	270
					20-3/16	1	24-3/16	1110	950	870	770	680	590	500	440	370	290
					20-3/16	2-6 CL	24-3/16	1660	1430	1290	1150	1010	880	750	660	550	430
					24-3/16	1	28-3/16	1160	1000	900	800	710	610	520	460	380	300
					24-3/16	2-6 CL	28-3/16	1740	1500	1360	1200	1060	920	780	700	570	450
3/4"	VC3/4-34	3-1/4" SQ.	40	.020	14-3/16	1	18-3/16	1230	1060	960	850	750	650	550	490	410	320
					20-3/16	1	24-3/16	1300	1120	1010	900	790	690	590	520	430	340
					20-3/16	2-6 CL	24-3/16	1890	1630	1470	1300	1150	1000	850	760	620	490
					24-3/16	1	28-3/16	1390	1200	1080	960	850	740	630	560	460	360
					24-3/16	2-6 CL	28-3/16	2010	1730	1570	1390	1230	1070	900	800	660	520
3/4"	VC3/4-35	3-1/4" SQ.	50	.020	14-3/16	1	18-3/16	1370	1180	1070	950	840	730	620	550	450	360
					20-3/16	1	24-3/16	1460	1260	1140	1010	890	770	660	580	480	380
					20-3/16	2-6 CL	24-3/16	2040	1750	1590	1410	1240	1080	920	820	670	530
					24-3/16	1	28-3/16	1550	1330	1210	1070	950	820	700	620	510	400
					24-3/16	2-6 CL	28-3/16	2170	1870	1690	1500	1320	1150	980	870	720	560
1"	VC33	3-1/4" SQ.	32	.020	14-3/16	1	18-3/16	1130	970	880	780	690	600	510	450	370	290
					20-3/16	1	24-3/16	1190	1020	930	820	730	630	540	480	390	310
					20-3/16	2-6 CL	24-3/16	1780	1530	1390	1230	1090	940	800	710	590	460
					24-3/16	1	28-3/16	1250	1080	980	860	760	660	560	500	410	330
					24-3/16	2-6 CL	28-3/16	1870	1610	1460	1290	1140	990	840	750	620	490
1"	VC34	3-1/4" SQ.	40	.020	14-3/16	1	18-3/16	1270	1090	990	880	770	670	570	510	420	330
					20-3/16	1	24-3/16	1340	1150	1050	920	820	710	600	540	440	350
					20-3/16	2-6 CL	24-3/16	1940	1670	1510	1340	1180	1030	870	780	640	500
					24-3/16	1	28-3/16	1430	1230	1120	990	870	760	640	570	470	370
					24-3/16	2-6 CL	28-3/16	1920	1650	1500	1320	1170	1020	860	770	630	500
1"	VC35	3-1/4" SQ.	50	.020	14-3/16	1	18-3/16	1320	1140	1030	910	810	700	590	530	440	340
					20-3/16	1	24-3/16	1400	1200	1090	970	850	740	630	560	460	360
					20-3/16	2-6 CL	24-3/16	1950	1680	1520	1350	1190	1030	880	780	640	510
					24-3/16	1	28-3/16	1490	1280	1160	1030	910	790	670	600	490	390
					24-3/16	2-6 CL	28-3/16	2080	1790	1620	1440	1270	1100	940	830	690	540
1-1/4"	VC133	3-1/4" SQ.	32	.020	14-3/16	1	18-3/16	1130	970	880	780	690	600	510	450	370	290
					20-3/16	1	24-3/16	1190	1020	930	820	730	630	540	480	390	310
					20-3/16	2-6 CL	24-3/16	1780	1530	1390	1230	1090	940	800	710	590	460
					24-3/16	1	28-3/16	1250	1080	980	860	760	660	560	500	410	330
					24-3/16	2-6 CL	28-3/16	1870	1610	1460	1290	1140	990	840	750	620	490
1-1/4"	VC134	3-1/4" SQ.	40	.020	14-3/16	1	18-3/16	1250	1080	980	860	760	660	560	500	410	330
					20-3/16	1	24-3/16	1320	1140	1030	910	810	700	590	530	440	340
					20-3/16	2-6 CL	24-3/16	1920	1650	1500	1320	1170	1020	860	770	630	500
					24-3/16	1	28-3/16	1410	1210	1100	970	860	750	630	560	470	370
					24-3/16	2-6 CL	28-3/16	1890	1630	1470	1300	1150	1000	850	760	620	490
1-1/4"	VC135	3-1/4" SQ.	50	.020	14-3/16	1	18-3/16	1300	1120	1010	900	790	690	590	520	430	340
					20-3/16	1	24-3/16	1390	1200	1080	960	850	740	630	560	460	360
					20-3/16	2-6 CL	24-3/16	1940	1670	1510	1340	1180	1030	870	780	640	500
					24-3/16	1	28-3/16	1470	1260	1150	1010	900	780	660	590	490	380
					24-3/16	2-6 CL	28-3/16	2050	1760	1600	1410	1250	1090	920	820	680	530
24-3/16	3-6 CL	28-3/16	2320	2000	1810	1600	1420	1230	1040	930	770	600					

Copper tube furnished flared one end standard.

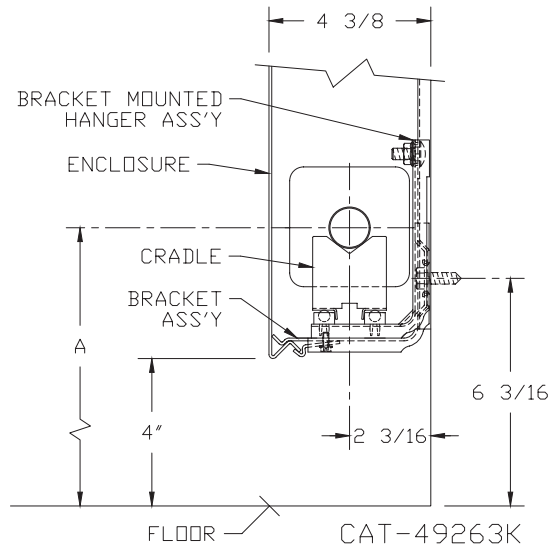
STYLES JDV3 14 20 & 24 DURA-VANE II

STEEL ELEMENT RATINGS					ENCL HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)									
TUBE SIZE	CATALOG DESIGNATION	FIN SIZE HEIGHT X WIDTH	FIN PER FT.	FIN THICKNESS IN INCHES					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"	VS33	3-1/4" SQ.	32	.032	14-3/16	1	18-3/16	1030	890	800	710	630	550	460	410	340	270	
					20-3/16	1	24-3/16	1130	970	880	780	690	600	510	450	370	290	
					20-3/16	2-6 CL	24-3/16	1640	1410	1280	1130	1000	870	740	660	540	430	
					24-3/16	1	28-3/16	1170	1010	910	810	710	620	530	470	390	300	
					24-3/16	2-6 CL	28-3/16	1700	1460	1330	1170	1040	900	770	680	560	440	
1"	VS34	3-1/4" SQ.	40	.032	14-3/16	1	18-3/16	1100	950	860	760	670	580	500	440	360	290	
					20-3/16	1	24-3/16	1280	1100	1000	880	780	680	580	510	420	330	
					20-3/16	2-6 CL	24-3/16	1800	1550	1400	1240	1100	950	810	720	590	470	
					24-3/16	1	28-3/16	1315	1130	1030	910	800	700	590	530	430	340	
					24-3/16	2-6 CL	28-3/16	1860	1600	1450	1280	1130	990	840	740	610	480	
1"	VS35	3-1/4" SQ.	50	.032	14-3/16	1	18-3/16	1175	1010	920	810	720	620	530	470	390	310	
					20-3/16	1	24-3/16	1340	1150	1050	920	820	710	600	540	440	350	
					20-3/16	2-6 CL	24-3/16	1870	1610	1460	1290	1140	990	840	750	620	490	
					24-3/16	1	28-3/16	1390	1200	1080	960	850	740	630	560	460	360	
					24-3/16	2-6 CL	28-3/16	1930	1660	1510	1330	1180	1020	870	770	640	500	
1-1/4"	VS133	3-1/4" SQ.	32	.032	14-3/16	1	18-3/16	1020	880	800	700	620	540	460	410	340	270	
					20-3/16	1	24-3/16	1120	960	870	770	680	590	500	450	370	290	
					20-3/16	2-6 CL	24-3/16	1680	1440	1310	1160	1020	890	760	670	550	440	
					24-3/16	1	28-3/16	1160	1000	900	800	710	610	520	460	380	300	
					24-3/16	2-6 CL	28-3/16	1740	1500	1360	1200	1060	920	780	700	570	450	
1-1/4"	VS134	3-1/4" SQ.	40	.032	14-3/16	1	18-3/16	1110	950	870	770	680	590	500	440	370	290	
					20-3/16	1	24-3/16	1290	1110	1010	890	790	680	580	520	430	340	
					20-3/16	2-6 CL	24-3/16	1800	1550	1400	1240	1100	950	810	720	590	470	
					24-3/16	1	28-3/16	1330	1140	1040	920	810	700	600	530	440	350	
					24-3/16	2-6 CL	28-3/16	1860	1600	1450	1280	1130	990	840	740	610	480	
1-1/4"	VS135	3-1/4" SQ.	50	.032	14-3/16	1	18-3/16	1145	980	890	790	700	610	520	460	380	300	
					20-3/16	1	24-3/16	1305	1120	1020	900	800	690	590	520	430	340	
					20-3/16	2-6 CL	24-3/16	1830	1570	1430	1260	1120	970	820	730	600	480	
					24-3/16	1	28-3/16	1350	1160	1050	930	820	720	610	540	450	350	
					24-3/16	2-6 CL	28-3/16	1890	1630	1470	1300	1150	1000	850	760	620	490	
24-3/16	3-6 CL	28-3/16	2140	1840	1670	1480	1310	1130	960	860	710	560						

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

"3" OFFSET

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	1	7"	9 1/16
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



DESIGN DATA

COMMERCIAL FINNED TUBE CHARTS FOR RATING CORRECTIONS

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

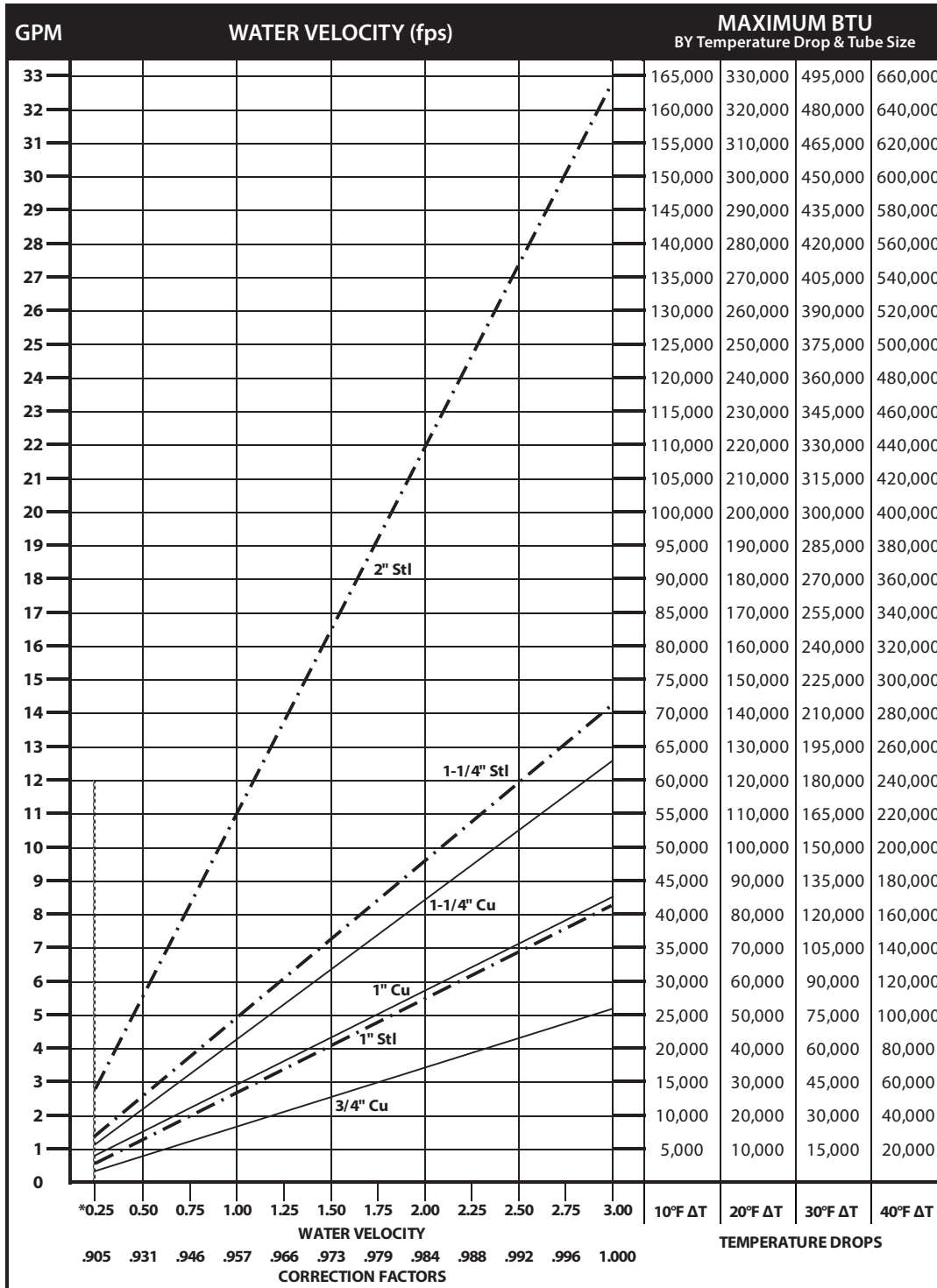
CORRECTION FACTORS FOR WATER TEMPERATURES AND AIR TEMPERATURES OTHER THAN STANDARD															
AVERAGE WATER TEMP. °F	ENTERING AIR TEMPERATURE °F														
	45	55	STD 65	70	75	80	85	90	95	100	110	120	130	140	150
90	.19	.13	.11	.06											
100	.25	.19	.15	.11	.08	.06									
110	.31	.25	.20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



*Do not design below .25 fps.

DYNAMIC FORMULAS

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

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

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

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

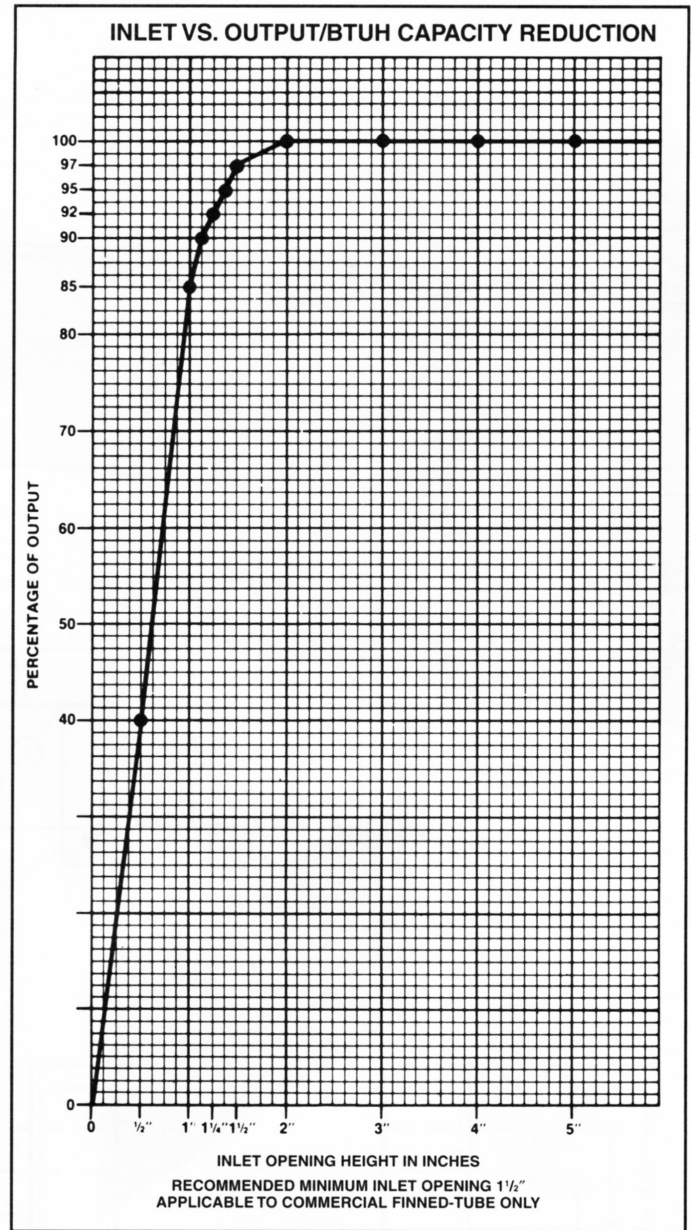
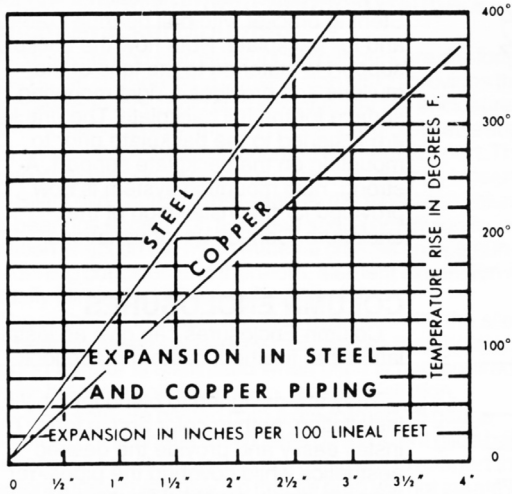
DESIGN DATA

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