

# LINOVECTOR II

LV3-FT / LV4-FT 14 20 24  
Copper/Aluminum and  
Steel Element Ratings

## Submittal

### Specification

#### LV3 Slip Jointed Enclosure

##### ENCLOSURE:

STYLE: Flat Top, 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: ☐ 14"  
☐ 20" (LV4 only)  
☐ 24" (LV4 only)

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)

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

#### LV4 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:

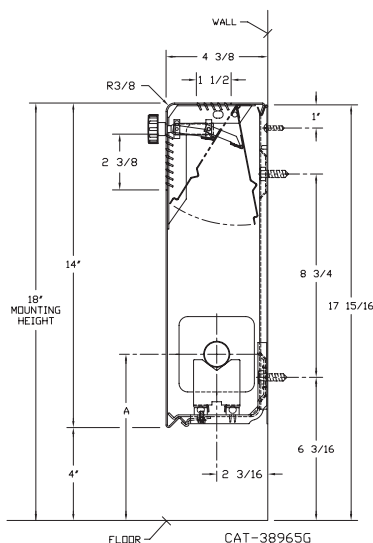
☐ Water Brkt w/B.B.  
☐ Steam Brkt w/Brkt Mtd  
B.B. Hgr

##### DAMPER:

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

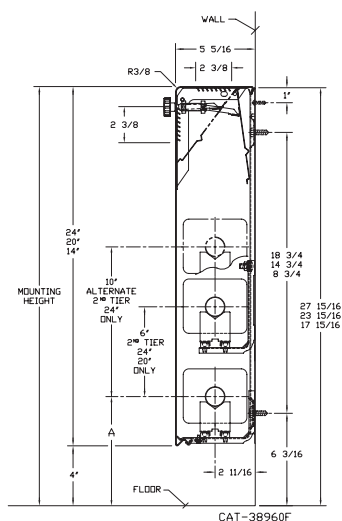
#### LV3-FT14

| ELEMENT<br>TUBE SIZE | FIN SIZE<br>HEIGHT x WIDTH | CRADLE<br>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 |



#### LV4-FT14 20 24

| ELEMENT<br>TUBE SIZE | FIN SIZE<br>HEIGHT x WIDTH | CRADLE<br>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  |



**Vulcan**  
RADIATOR

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www.vulcanrad.com

PROJECT: \_\_\_\_\_ DATE: \_\_\_\_\_

LOCATION: \_\_\_\_\_

ARCHITECT: \_\_\_\_\_

ENGINEER: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

PO NUMBER: \_\_\_\_\_

# STYLE "LV3-FT / LV4-FT 14 20 24" LINOVECTOR II

## COPPER/ALUMINUM ELEMENTS

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

| TUBE<br>SIZE | CATALOG<br>DESIGNATION | FIN SIZE<br>HEIGHT X WIDTH | FINS<br>PER<br>FT. | FIN<br>THICKNESS<br>IN INCHES | ENCL<br>HEIGHT<br>IN INCHES | TIERS<br>AND<br>CENTERS<br>IN INCHES | MOUNTING<br>HEIGHT<br>IN INCHES | STEAM<br>215°<br>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"         | VC3/4-33               | 3-1/4" SQ.                 | 32                 | .020                          | 14                          | 1                                    | 18                              | 1040                    | 890                                               | 810  | 720  | 630  | 550  | 470  | 420  | 340  | 270  |
| 3/4"         | VC3/4-34               | 3-1/4" SQ.                 | 40                 | .020                          | 14                          | 1                                    | 18                              | 1210                    | 1040                                              | 940  | 830  | 740  | 640  | 540  | 480  | 400  | 310  |
| 3/4"         | VC3/4-35               | 3-1/4" SQ.                 | 50                 | .020                          | 14                          | 1                                    | 18                              | 1340                    | 1150                                              | 1050 | 920  | 820  | 710  | 600  | 540  | 440  | 350  |
| 1"           | VC33                   | 3-1/4" SQ.                 | 32                 | .020                          | 14                          | 1                                    | 18                              | 1010                    | 870                                               | 790  | 700  | 620  | 540  | 450  | 400  | 330  | 260  |
| 1"           | VC34                   | 3-1/4" SQ.                 | 40                 | .020                          | 14                          | 1                                    | 18                              | 1180                    | 1010                                              | 920  | 810  | 720  | 630  | 530  | 470  | 390  | 310  |
| 1"           | VC35                   | 3-1/4" SQ.                 | 50                 | .020                          | 14                          | 1                                    | 18                              | 1290                    | 1110                                              | 1010 | 890  | 790  | 680  | 580  | 520  | 430  | 340  |
| 1 1/4"       | VC133                  | 3-1/4" SQ.                 | 32                 | .020                          | 14                          | 1                                    | 18                              | 970                     | 830                                               | 760  | 670  | 590  | 510  | 440  | 390  | 320  | 250  |
| 1 1/4"       | VC134                  | 3-1/4" SQ.                 | 40                 | .020                          | 14                          | 1                                    | 18                              | 1130                    | 970                                               | 880  | 780  | 690  | 600  | 510  | 450  | 370  | 290  |
| 1 1/4"       | VC135                  | 3-1/4" SQ.                 | 50                 | .020                          | 14                          | 1                                    | 18                              | 1250                    | 1080                                              | 980  | 860  | 760  | 660  | 560  | 500  | 410  | 330  |
| 3/4"         | VC3/4-433              | 3-5/8" x 4-1/4"            | 32                 | .020                          | 14                          | 1                                    | 18                              | 1440                    | 1240                                              | 1120 | 990  | 880  | 760  | 650  | 580  | 480  | 370  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1520                    | 1310                                              | 1190 | 1050 | 930  | 810  | 680  | 610  | 500  | 400  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2150                    | 1850                                              | 1680 | 1480 | 1310 | 1140 | 970  | 860  | 710  | 560  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1560                    | 1340                                              | 1220 | 1080 | 950  | 830  | 700  | 620  | 510  | 410  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2230                    | 1920                                              | 1740 | 1540 | 1360 | 1180 | 1000 | 890  | 740  | 580  |
| 3/4"         | VC3/4-433              | 3-5/8" x 4-1/4"            | 32                 | .020                          | 24                          | 3-6 CL                               | 28                              | 2560                    | 2200                                              | 2000 | 1770 | 1560 | 1360 | 1150 | 1020 | 840  | 670  |
|              |                        |                            |                    |                               | 14                          | 1                                    | 18                              | 1620                    | 1390                                              | 1260 | 1120 | 990  | 860  | 730  | 650  | 530  | 420  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1700                    | 1460                                              | 1330 | 1170 | 1040 | 900  | 770  | 680  | 560  | 440  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2410                    | 2070                                              | 1880 | 1660 | 1470 | 1280 | 1080 | 960  | 800  | 630  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1740                    | 1500                                              | 1360 | 1200 | 1060 | 920  | 780  | 700  | 570  | 450  |
| 3/4"         | VC3/4-434              | 3-5/8" x 4-1/4"            | 40                 | .020                          | 24                          | 2-6 CL                               | 28                              | 2490                    | 2140                                              | 1940 | 1720 | 1520 | 1320 | 1120 | 1000 | 820  | 650  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2840                    | 2440                                              | 2220 | 1960 | 1730 | 1510 | 1280 | 1140 | 940  | 740  |
|              |                        |                            |                    |                               | 14                          | 1                                    | 18                              | 1770                    | 1520                                              | 1380 | 1220 | 1080 | 940  | 800  | 710  | 580  | 460  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1920                    | 1650                                              | 1500 | 1320 | 1170 | 1020 | 860  | 770  | 630  | 500  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2680                    | 2300                                              | 2090 | 1850 | 1630 | 1420 | 1210 | 1070 | 880  | 700  |
| 3/4"         | VC3/4-435              | 3-5/8" x 4-1/4"            | 50                 | .020                          | 24                          | 1                                    | 28                              | 1990                    | 1710                                              | 1550 | 1370 | 1210 | 1050 | 900  | 800  | 660  | 520  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2860                    | 2460                                              | 2230 | 1970 | 1740 | 1520 | 1290 | 1140 | 940  | 740  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 3230                    | 2780                                              | 2520 | 2230 | 1970 | 1710 | 1450 | 1290 | 1070 | 840  |
|              |                        |                            |                    |                               | 14                          | 1                                    | 18                              | 1460                    | 1260                                              | 1140 | 1010 | 890  | 770  | 660  | 580  | 480  | 380  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1520                    | 1310                                              | 1190 | 1050 | 930  | 810  | 680  | 610  | 500  | 400  |
| 1"           | VC433                  | 3-5/8" x 4-1/4"            | 32                 | .020                          | 20                          | 2-6 CL                               | 24                              | 2320                    | 2000                                              | 1810 | 1600 | 1420 | 1230 | 1040 | 930  | 770  | 600  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1570                    | 1350                                              | 1220 | 1080 | 960  | 830  | 710  | 630  | 520  | 410  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2380                    | 2050                                              | 1860 | 1640 | 1450 | 1260 | 1070 | 950  | 790  | 620  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2740                    | 2360                                              | 2140 | 1890 | 1670 | 1450 | 1230 | 1100 | 900  | 710  |
|              |                        |                            |                    |                               | 14                          | 1                                    | 18                              | 1670                    | 1440                                              | 1300 | 1150 | 1020 | 890  | 750  | 670  | 550  | 430  |
| 1"           | VC434                  | 3-5/8" x 4-1/4"            | 40                 | .020                          | 20                          | 1                                    | 24                              | 1780                    | 1530                                              | 1390 | 1230 | 1090 | 940  | 800  | 710  | 590  | 460  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2490                    | 2140                                              | 1940 | 1720 | 1520 | 1320 | 1120 | 1000 | 820  | 650  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1820                    | 1570                                              | 1420 | 1260 | 1110 | 960  | 820  | 730  | 600  | 470  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2570                    | 2210                                              | 2000 | 1770 | 1570 | 1360 | 1160 | 1030 | 850  | 670  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2930                    | 2520                                              | 2290 | 2020 | 1790 | 1550 | 1320 | 1170 | 970  | 760  |
| 1"           | VC435                  | 3-5/8" x 4-1/4"            | 50                 | .020                          | 14                          | 1                                    | 18                              | 1860                    | 1600                                              | 1450 | 1280 | 1130 | 990  | 840  | 740  | 610  | 480  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 2010                    | 1730                                              | 1570 | 1390 | 1230 | 1070 | 900  | 800  | 660  | 520  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2510                    | 2160                                              | 1960 | 1730 | 1530 | 1330 | 1130 | 1000 | 830  | 650  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 2080                    | 1790                                              | 1620 | 1440 | 1270 | 1100 | 940  | 830  | 690  | 540  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2680                    | 2300                                              | 2090 | 1850 | 1630 | 1420 | 1210 | 1070 | 880  | 700  |
| 1-1/4"       | VC1433                 | 3-5/8" x 4-1/4"            | 32                 | .020                          | 24                          | 3-6 CL                               | 28                              | 3030                    | 2610                                              | 2360 | 2090 | 1850 | 1610 | 1360 | 1210 | 1000 | 790  |
|              |                        |                            |                    |                               | 14                          | 1                                    | 18                              | 1430                    | 1230                                              | 1120 | 990  | 870  | 760  | 640  | 570  | 470  | 370  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1490                    | 1280                                              | 1160 | 1030 | 910  | 790  | 670  | 600  | 490  | 390  |
|              |                        |                            |                    |                               | 20                          | 2 @ 6 CL                             | 24                              | 2280                    | 1960                                              | 1780 | 1570 | 1390 | 1210 | 1030 | 910  | 750  | 590  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1540                    | 1320                                              | 1200 | 1060 | 940  | 820  | 690  | 620  | 510  | 400  |
| 1-1/4"       | VC1433                 | 3-5/8" x 4-1/4"            | 32                 | .020                          | 24                          | 2 @ 6 CL                             | 28                              | 2340                    | 2010                                              | 1830 | 1610 | 1430 | 1240 | 1050 | 940  | 770  | 610  |
|              |                        |                            |                    |                               | 24                          | 3 @ 6 CL                             | 28                              | 2690                    | 2310                                              | 2100 | 1860 | 1640 | 1430 | 1210 | 1080 | 890  | 700  |
|              |                        |                            |                    |                               | 14                          | 1                                    | 18                              | 1630                    | 1400                                              | 1270 | 1120 | 990  | 860  | 730  | 650  | 540  | 420  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1740                    | 1500                                              | 1360 | 1200 | 1060 | 920  | 780  | 700  | 570  | 450  |
|              |                        |                            |                    |                               | 20                          | 2 @ 6 CL                             | 24                              | 2440                    | 2100                                              | 1900 | 1680 | 1490 | 1290 | 1100 | 980  | 810  | 630  |
| 1-1/4"       | VC1434                 | 3-5/8" x 4-1/4"            | 40                 | .020                          | 24                          | 1                                    | 28                              | 1780                    | 1530                                              | 1390 | 1230 | 1090 | 940  | 800  | 710  | 590  | 460  |
|              |                        |                            |                    |                               | 24                          | 2 @ 6 CL                             | 28                              | 2520                    | 2170                                              | 1970 | 1740 | 1540 | 1340 | 1130 | 1010 | 830  | 660  |
|              |                        |                            |                    |                               | 24                          | 3 @ 6 CL                             | 28                              | 2870                    | 2470                                              | 2240 | 1980 | 1750 | 1520 | 1290 | 1150 | 950  | 750  |
|              |                        |                            |                    |                               | 14                          | 1                                    | 18                              | 1820                    | 1570                                              | 1420 | 1260 | 1110 | 960  | 820  | 730  | 600  | 470  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1970                    | 1690                                              | 1540 | 1360 | 1200 | 1040 | 890  | 790  | 650  | 510  |
| 1-1/4"       | VC1435                 | 3-5/8" x 4-1/4"            | 50                 | .020                          | 20                          | 2 @ 6 CL                             | 24                              | 2460                    | 2120                                              | 1920 | 1700 | 1500 | 1300 | 1110 | 980  | 810  | 640  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 2040                    | 1750                                              | 1590 | 1410 | 1240 | 1080 | 920  | 820  | 670  | 530  |
|              |                        |                            |                    |                               | 24                          | 2 @ 6 CL                             | 28                              | 2620                    | 2250                                              | 2040 | 1810 | 1600 | 1390 | 1180 | 1050 | 860  | 680  |
|              |                        |                            |                    |                               | 24                          | 3 @ 6 CL                             | 28                              | 2960                    | 2550                                              | 2310 | 2040 | 1810 | 1570 | 1330 | 1180 | 980  | 770  |
|              |                        |                            |                    |                               | 24                          | 3 @ 6 CL                             | 28                              | 2960                    | 2550                                              | 2310 | 2040 | 1810 | 1570 | 1330 | 1180 | 980  | 770  |

# STYLE "LV3-FT / LV4-FT 14 20 24" LINOVECTOR II

## COPPER/ALUMINUM ELEMENTS

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

| TUBE<br>SIZE | CATALOG<br>DESIGNATION | FIN SIZE<br>HEIGHT X WIDTH | FINS<br>PER<br>FT. | FIN<br>THICKNESS<br>IN INCHES | ENCL<br>HEIGHT<br>IN INCHES | TIERS<br>AND<br>CENTERS<br>IN INCHES | MOUNTING<br>HEIGHT<br>IN INCHES | STEAM<br>215°<br>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"         | VC3/4-43               | 4-1/4" SQ.                 | 32                 | .020                          | 14                          | 1                                    | 18                              | 1460                    | 1260                                              | 1140 | 1010 | 890  | 770  | 660  | 580  | 480  | 380  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1540                    | 1320                                              | 1200 | 1060 | 940  | 820  | 690  | 620  | 510  | 400  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2360                    | 2030                                              | 1840 | 1630 | 1440 | 1250 | 1060 | 940  | 780  | 610  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1570                    | 1350                                              | 1220 | 1080 | 960  | 830  | 710  | 630  | 520  | 410  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2440                    | 2100                                              | 1900 | 1680 | 1490 | 1290 | 1100 | 980  | 810  | 630  |
| 24           | 3-6 CL                 | 28                         | 2810               | 2420                          | 2190                        | 1940                                 | 1710                            | 1490                    | 1260                                              | 1120 | 930  | 730  |      |      |      |      |      |
| 3/4"         | VC3/4-44               | 4-1/4" SQ.                 | 40                 | .020                          | 14                          | 1                                    | 18                              | 1850                    | 1590                                              | 1440 | 1280 | 1130 | 980  | 830  | 740  | 610  | 480  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 2080                    | 1790                                              | 1620 | 1440 | 1270 | 1100 | 940  | 830  | 690  | 540  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2500                    | 2150                                              | 1950 | 1720 | 1530 | 1330 | 1130 | 1000 | 830  | 650  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 2120                    | 1820                                              | 1650 | 1460 | 1290 | 1120 | 950  | 850  | 700  | 550  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2650                    | 2280                                              | 2070 | 1830 | 1620 | 1400 | 1190 | 1060 | 870  | 690  |
| 24           | 3-6 CL                 | 28                         | 3020               | 2600                          | 2360                        | 2080                                 | 1840                            | 1600                    | 1360                                              | 1210 | 1000 | 790  |      |      |      |      |      |
| 3/4"         | VC3/4-45               | 4-1/4" SQ.                 | 50                 | .020                          | 14                          | 1                                    | 18                              | 1815                    | 1560                                              | 1420 | 1250 | 1110 | 960  | 820  | 730  | 600  | 470  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1970                    | 1690                                              | 1540 | 1360 | 1200 | 1040 | 890  | 790  | 650  | 510  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2565                    | 2210                                              | 2000 | 1770 | 1560 | 1360 | 1150 | 1030 | 850  | 670  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 2040                    | 1750                                              | 1590 | 1410 | 1240 | 1080 | 920  | 820  | 670  | 530  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2795                    | 2400                                              | 2180 | 1930 | 1700 | 1480 | 1260 | 1120 | 920  | 730  |
| 24           | 3-6 CL                 | 28                         | 3160               | 2720                          | 2460                        | 2180                                 | 1930                            | 1670                    | 1420                                              | 1260 | 1040 | 820  |      |      |      |      |      |
| 1"           | VC43                   | 4-1/4" SQ.                 | 32                 | .020                          | 14                          | 1                                    | 18                              | 1620                    | 1390                                              | 1260 | 1120 | 990  | 860  | 730  | 650  | 530  | 420  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1660                    | 1430                                              | 1290 | 1150 | 1010 | 880  | 750  | 660  | 550  | 430  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2460                    | 2120                                              | 1920 | 1700 | 1500 | 1300 | 1110 | 980  | 810  | 640  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1690                    | 1450                                              | 1320 | 1170 | 1030 | 900  | 760  | 680  | 560  | 440  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2510                    | 2160                                              | 1960 | 1730 | 1530 | 1330 | 1130 | 1000 | 830  | 650  |
| 24           | 3-6 CL                 | 28                         | 2890               | 2490                          | 2250                        | 1990                                 | 1760                            | 1530                    | 1300                                              | 1160 | 950  | 750  |      |      |      |      |      |
| 1"           | VC44                   | 4-1/4" SQ.                 | 40                 | .020                          | 14                          | 1                                    | 18                              | 1760                    | 1510                                              | 1370 | 1210 | 1070 | 930  | 790  | 700  | 580  | 460  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1940                    | 1670                                              | 1510 | 1340 | 1180 | 1030 | 870  | 780  | 640  | 500  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2560                    | 2200                                              | 2000 | 1770 | 1560 | 1360 | 1150 | 1020 | 840  | 670  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 2010                    | 1730                                              | 1570 | 1390 | 1230 | 1070 | 900  | 800  | 660  | 520  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2700                    | 2320                                              | 2110 | 1860 | 1650 | 1430 | 1220 | 1080 | 890  | 700  |
| 24           | 3-6 CL                 | 28                         | 3080               | 2650                          | 2400                        | 2130                                 | 1880                            | 1630                    | 1390                                              | 1230 | 1020 | 800  |      |      |      |      |      |
| 1"           | VC45                   | 4-1/4" SQ.                 | 50                 | .020                          | 14                          | 1                                    | 18                              | 1900                    | 1630                                              | 1480 | 1310 | 1160 | 1010 | 860  | 760  | 630  | 490  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 2120                    | 1820                                              | 1650 | 1460 | 1290 | 1120 | 950  | 850  | 700  | 550  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2550                    | 2190                                              | 1990 | 1760 | 1560 | 1350 | 1150 | 1020 | 840  | 660  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 2220                    | 1910                                              | 1730 | 1530 | 1350 | 1180 | 1000 | 890  | 730  | 580  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2730                    | 2350                                              | 2130 | 1880 | 1670 | 1450 | 1230 | 1090 | 900  | 710  |
| 24           | 3-6 CL                 | 28                         | 3080               | 2650                          | 2400                        | 2130                                 | 1880                            | 1630                    | 1390                                              | 1230 | 1020 | 800  |      |      |      |      |      |
| 1-1/4"       | VC143                  | 4-1/4" SQ.                 | 32                 | .020                          | 14                          | 1                                    | 18                              | 1590                    | 1370                                              | 1240 | 1100 | 970  | 840  | 720  | 640  | 520  | 410  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1630                    | 1400                                              | 1270 | 1120 | 990  | 860  | 730  | 650  | 540  | 420  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2420                    | 2080                                              | 1890 | 1670 | 1480 | 1280 | 1090 | 970  | 800  | 630  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1660                    | 1430                                              | 1290 | 1150 | 1010 | 880  | 750  | 660  | 550  | 430  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2470                    | 2120                                              | 1930 | 1700 | 1510 | 1310 | 1110 | 990  | 820  | 640  |
| 24           | 3-6 CL                 | 28                         | 2840               | 2440                          | 2220                        | 1960                                 | 1730                            | 1510                    | 1280                                              | 1140 | 940  | 740  |      |      |      |      |      |
| 1-1/4"       | VC144                  | 4-1/4" SQ.                 | 40                 | .020                          | 14                          | 1                                    | 18                              | 1730                    | 1490                                              | 1350 | 1190 | 1060 | 920  | 780  | 690  | 570  | 450  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1900                    | 1630                                              | 1480 | 1310 | 1160 | 1010 | 860  | 760  | 630  | 490  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2510                    | 2160                                              | 1960 | 1730 | 1530 | 1330 | 1130 | 1000 | 830  | 650  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1970                    | 1690                                              | 1540 | 1360 | 1200 | 1040 | 890  | 790  | 650  | 510  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2660                    | 2290                                              | 2070 | 1840 | 1620 | 1410 | 1200 | 1060 | 880  | 690  |
| 24           | 3-6 CL                 | 28                         | 3030               | 2610                          | 2360                        | 2090                                 | 1850                            | 1610                    | 1360                                              | 1210 | 1000 | 790  |      |      |      |      |      |
| 1-1/4"       | VC145                  | 4-1/4" SQ.                 | 50                 | .020                          | 14                          | 1                                    | 18                              | 1860                    | 1600                                              | 1450 | 1280 | 1130 | 990  | 840  | 740  | 610  | 480  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 2080                    | 1790                                              | 1620 | 1440 | 1270 | 1100 | 940  | 830  | 690  | 540  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2510                    | 2160                                              | 1960 | 1730 | 1530 | 1330 | 1130 | 1000 | 830  | 650  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 2190                    | 1880                                              | 1710 | 1510 | 1340 | 1160 | 990  | 880  | 720  | 570  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2680                    | 2300                                              | 2090 | 1850 | 1630 | 1420 | 1210 | 1070 | 880  | 700  |
| 24           | 3-6 CL                 | 28                         | 3030               | 2610                          | 2360                        | 2090                                 | 1850                            | 1610                    | 1360                                              | 1210 | 1000 | 790  |      |      |      |      |      |

Note: Copper tube furnished flared one end standard.

# STYLE "LV3-FT / LV4-FT 14 20 24" LINOVECTOR II

## STEEL ELEMENTS

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

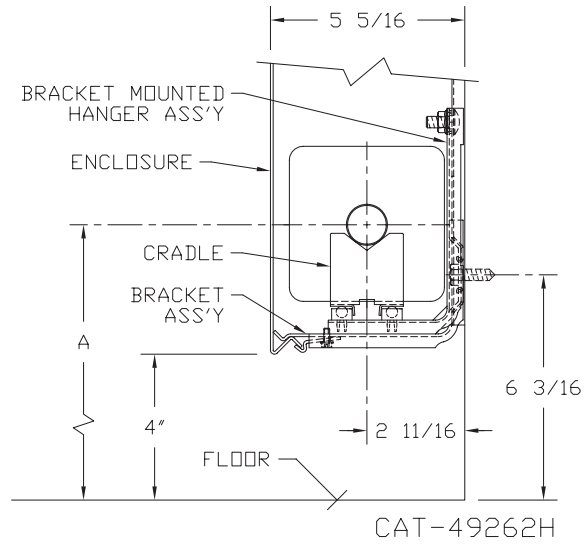
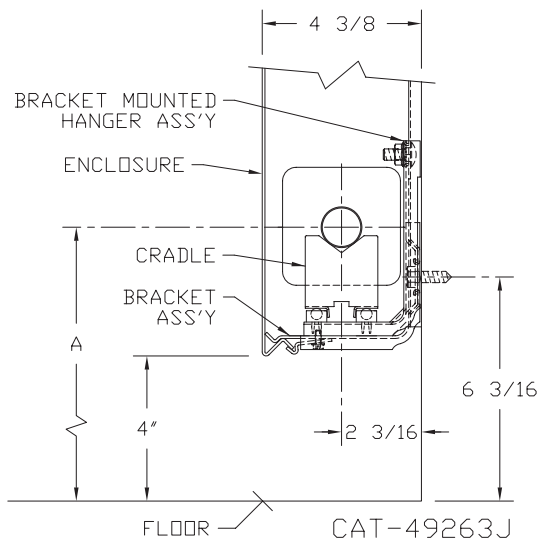
| TUBE<br>SIZE | CATALOG<br>DESIGNATION | FIN SIZE<br>HEIGHT X WIDTH | FINS<br>PER<br>FT. | FIN<br>THICKNESS<br>IN INCHES | ENCL<br>HEIGHT<br>IN INCHES | TIERS<br>AND<br>CENTERS<br>IN INCHES | MOUNTING<br>HEIGHT<br>IN INCHES | STEAM<br>215°<br>FACTOR | HOT WATER (AVG.)                                  |      |      |      |      |      |      |      |      |
|--------------|------------------------|----------------------------|--------------------|-------------------------------|-----------------------------|--------------------------------------|---------------------------------|-------------------------|---------------------------------------------------|------|------|------|------|------|------|------|------|
|              |                        |                            |                    |                               |                             |                                      |                                 |                         | 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"           | VS33                   | 3-1/4" SQ.                 | 32                 | .032                          | 14                          | 1                                    | 18                              | 920                     | 790                                               | 720  | 630  | 560  | 490  | 410  | 370  | 300  | 240  |
| 1"           | VS34                   | 3-1/4" SQ.                 | 40                 | .032                          | 14                          | 1                                    | 18                              | 1000                    | 860                                               | 780  | 690  | 610  | 530  | 450  | 400  | 330  | 260  |
| 1"           | VS35                   | 3-1/4" SQ.                 | 50                 | .032                          | 14                          | 1                                    | 18                              | 1070                    | 920                                               | 830  | 740  | 650  | 570  | 480  | 430  | 350  | 280  |
| 1-1/4"       | VS133                  | 3-1/4" SQ.                 | 32                 | .032                          | 14                          | 1                                    | 18                              | 910                     | 780                                               | 710  | 630  | 560  | 480  | 410  | 360  | 300  | 240  |
| 1-1/4"       | VS134                  | 3-1/4" SQ.                 | 40                 | .032                          | 14                          | 1                                    | 18                              | 1030                    | 890                                               | 800  | 710  | 630  | 550  | 460  | 410  | 340  | 270  |
| 1-1/4"       | VS135                  | 3-1/4" SQ.                 | 50                 | .032                          | 14                          | 1                                    | 18                              | 1060                    | 910                                               | 830  | 730  | 650  | 560  | 480  | 420  | 350  | 280  |
| 1"           | VS43                   | 4-1/4" SQ.                 | 32                 | .032                          | 14                          | 1                                    | 18                              | 1300                    | 1120                                              | 1010 | 900  | 790  | 690  | 590  | 520  | 430  | 340  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1355                    | 1170                                              | 1060 | 930  | 830  | 720  | 610  | 540  | 450  | 350  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2030                    | 1750                                              | 1580 | 1400 | 1240 | 1080 | 910  | 810  | 670  | 530  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1460                    | 1260                                              | 1140 | 1010 | 890  | 770  | 660  | 580  | 480  | 380  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2095                    | 1800                                              | 1630 | 1450 | 1280 | 1110 | 940  | 840  | 690  | 540  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2410                    | 2070                                              | 1880 | 1660 | 1470 | 1280 | 1080 | 960  | 800  | 630  |
| 1"           | VS44                   | 4-1/4" SQ.                 | 40                 | .032                          | 14                          | 1                                    | 18                              | 1455                    | 1250                                              | 1130 | 1000 | 890  | 770  | 650  | 580  | 480  | 380  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1550                    | 1330                                              | 1210 | 1070 | 950  | 820  | 700  | 620  | 510  | 400  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2195                    | 1890                                              | 1710 | 1510 | 1340 | 1160 | 990  | 880  | 720  | 570  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1605                    | 1380                                              | 1250 | 1110 | 980  | 850  | 720  | 640  | 530  | 420  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2295                    | 1970                                              | 1790 | 1580 | 1400 | 1220 | 1030 | 920  | 760  | 600  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2620                    | 2250                                              | 2040 | 1810 | 1600 | 1390 | 1180 | 1050 | 860  | 680  |
| 1"           | VS45                   | 4-1/4" SQ.                 | 50                 | .032                          | 14                          | 1                                    | 18                              | 1525                    | 1310                                              | 1190 | 1050 | 930  | 810  | 690  | 610  | 500  | 400  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1620                    | 1390                                              | 1260 | 1120 | 990  | 860  | 730  | 650  | 530  | 420  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2245                    | 1930                                              | 1750 | 1550 | 1370 | 1190 | 1010 | 900  | 740  | 580  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1680                    | 1440                                              | 1310 | 1160 | 1020 | 890  | 760  | 670  | 550  | 440  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2350                    | 2020                                              | 1830 | 1620 | 1430 | 1250 | 1060 | 940  | 780  | 610  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2660                    | 2290                                              | 2070 | 1840 | 1620 | 1410 | 1200 | 1060 | 880  | 690  |
| 1-1/4"       | VS143                  | 4-1/4" SQ.                 | 32                 | .032                          | 14                          | 1                                    | 18                              | 1190                    | 1020                                              | 930  | 820  | 730  | 630  | 540  | 480  | 390  | 310  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1220                    | 1050                                              | 950  | 840  | 740  | 650  | 550  | 490  | 400  | 320  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 1910                    | 1640                                              | 1490 | 1320 | 1170 | 1010 | 860  | 760  | 630  | 500  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1240                    | 1070                                              | 970  | 860  | 760  | 660  | 560  | 500  | 410  | 320  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 1940                    | 1670                                              | 1510 | 1340 | 1180 | 1030 | 870  | 780  | 640  | 500  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2230                    | 1920                                              | 1740 | 1540 | 1360 | 1180 | 1000 | 890  | 740  | 580  |
| 1-1/4"       | VS144                  | 4-1/4" SQ.                 | 40                 | .032                          | 14                          | 1                                    | 18                              | 1510                    | 1300                                              | 1180 | 1040 | 920  | 800  | 680  | 600  | 500  | 390  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1600                    | 1380                                              | 1250 | 1100 | 980  | 850  | 720  | 640  | 530  | 420  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2330                    | 2000                                              | 1820 | 1610 | 1420 | 1230 | 1050 | 930  | 770  | 610  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1660                    | 1430                                              | 1290 | 1150 | 1010 | 880  | 750  | 660  | 550  | 430  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2410                    | 2070                                              | 1880 | 1660 | 1470 | 1280 | 1080 | 960  | 800  | 630  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2750                    | 2370                                              | 2150 | 1900 | 1680 | 1460 | 1240 | 1100 | 910  | 720  |
| 1-1/4"       | VS145                  | 4-1/4" SQ.                 | 50                 | .032                          | 14                          | 1                                    | 18                              | 1515                    | 1300                                              | 1180 | 1050 | 920  | 800  | 680  | 610  | 500  | 390  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1610                    | 1380                                              | 1260 | 1110 | 980  | 850  | 720  | 640  | 530  | 420  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2200                    | 1890                                              | 1720 | 1520 | 1340 | 1170 | 990  | 880  | 730  | 570  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1670                    | 1440                                              | 1300 | 1150 | 1020 | 890  | 750  | 670  | 550  | 430  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2305                    | 1980                                              | 1800 | 1590 | 1410 | 1220 | 1040 | 920  | 760  | 600  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2600                    | 2240                                              | 2030 | 1790 | 1590 | 1380 | 1170 | 1040 | 860  | 680  |
| 2"           | VS242                  | 4-1/4" SQ.                 | 25                 | .032                          | 14                          | 1                                    | 18                              | 1160                    | 1000                                              | 900  | 800  | 710  | 610  | 520  | 460  | 380  | 300  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1190                    | 1020                                              | 930  | 820  | 730  | 630  | 540  | 480  | 390  | 310  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 1870                    | 1610                                              | 1460 | 1290 | 1140 | 990  | 840  | 750  | 620  | 490  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1210                    | 1040                                              | 940  | 830  | 740  | 640  | 540  | 480  | 400  | 310  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 1920                    | 1650                                              | 1500 | 1320 | 1170 | 1020 | 860  | 770  | 630  | 500  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2210                    | 1900                                              | 1720 | 1520 | 1350 | 1170 | 990  | 880  | 730  | 570  |
| 2"           | VS243                  | 4-1/4" SQ.                 | 32                 | .032                          | 14                          | 1                                    | 18                              | 1350                    | 1160                                              | 1050 | 930  | 820  | 720  | 610  | 540  | 450  | 350  |
|              |                        |                            |                    |                               | 20                          | 1                                    | 24                              | 1400                    | 1200                                              | 1090 | 970  | 850  | 740  | 630  | 560  | 460  | 360  |
|              |                        |                            |                    |                               | 20                          | 2-6 CL                               | 24                              | 2090                    | 1800                                              | 1630 | 1440 | 1270 | 1110 | 940  | 840  | 690  | 540  |
|              |                        |                            |                    |                               | 24                          | 1                                    | 28                              | 1430                    | 1230                                              | 1120 | 990  | 870  | 760  | 640  | 570  | 470  | 370  |
|              |                        |                            |                    |                               | 24                          | 2-6 CL                               | 28                              | 2160                    | 1860                                              | 1680 | 1490 | 1320 | 1140 | 970  | 860  | 710  | 560  |
|              |                        |                            |                    |                               | 24                          | 3-6 CL                               | 28                              | 2480                    | 2130                                              | 1930 | 1710 | 1510 | 1310 | 1120 | 990  | 820  | 640  |

- 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<br>TUBE SIZE | FIN SIZE<br>HEIGHT x WIDTH | CRADLE<br>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<br>TUBE SIZE | FIN SIZE<br>HEIGHT x WIDTH | CRADLE<br>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.

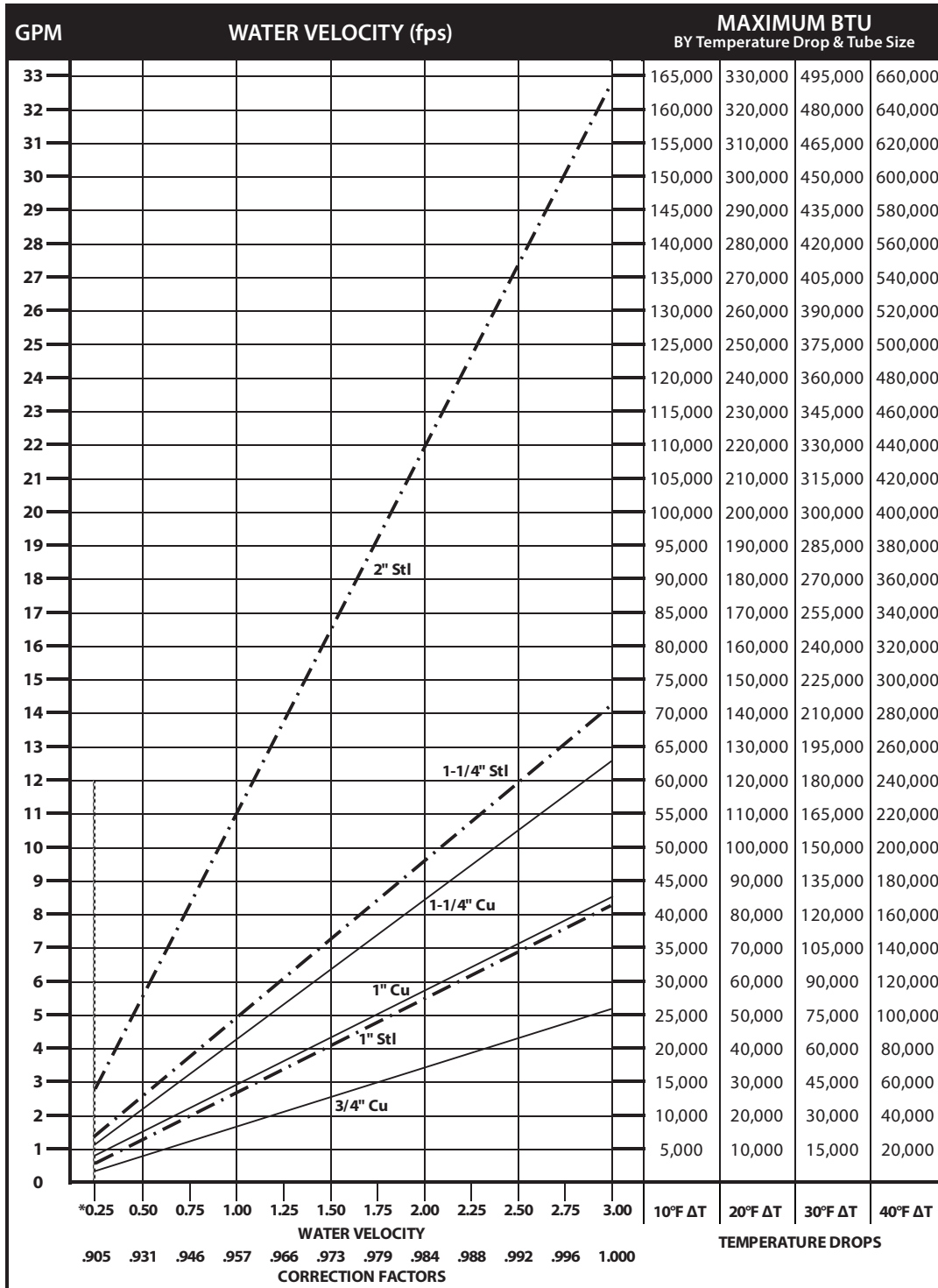
| CORRECTION FACTORS FOR WATER TEMPERATURES AND AIR TEMPERATURES OTHER THAN STANDARD |                             |      |        |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------------------------------------------------------------|-----------------------------|------|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| 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.<br>°F                 | 45   | 55   | STD<br>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<br>1.899<br>5                                                           | 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 |
|                                                                                 | 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 |
|                                                                                 | 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<br>15<br>20                                                                  | 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 |
|                                                                                 | 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 |
|                                                                                 | 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<br>30<br>40                                                                  | 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 |
|                                                                                 | 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 |
|                                                                                 | 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<br>60<br>70                                                                  | 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 |
|                                                                                 | 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 |
|                                                                                 | 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<br>90<br>100                                                                 | 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 |
|                                                                                 | 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 |
|                                                                                 | 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<br>150<br>175<br>200                                                        | 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 |
|                                                                                 | 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 |
|                                                                                 | 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 |
|                                                                                 | 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

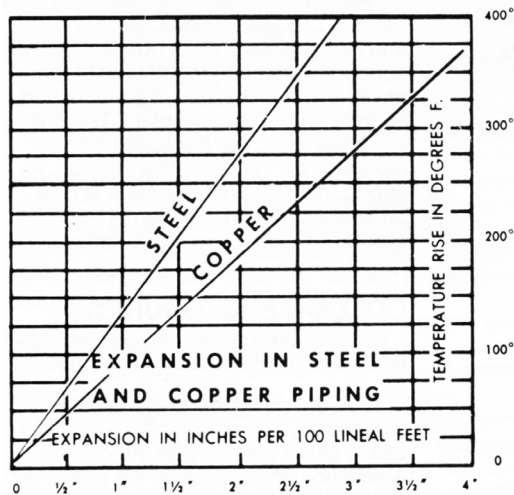
## GUARANTEED WORKING PRESSURES

- 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             |

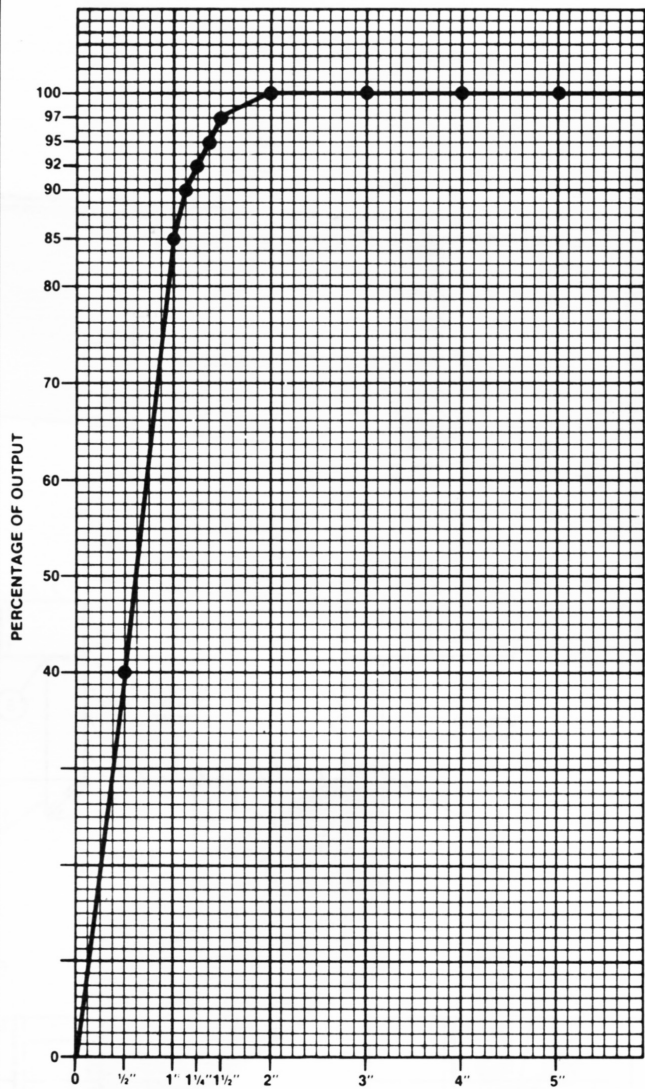
### Fluid Temperature 180°F

| % 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             |

## INLET VS. OUTPUT/BTUH CAPACITY REDUCTION



RECOMMENDED MINIMUM INLET OPENING 1 1/2"  
 APPLICABLE TO COMMERCIAL FINNED-TUBE ONLY

## 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               |