

# CLASSIC

## Submittal

JV4/V4-AR PM PM2  
Classic Architectural  
Copper/Aluminum and  
Steel Elements

### Specification

#### ☐ JV4 Slip Jointed Enclosure

##### ENCLOSURE:

STYLE: Classic Pedestal Mtd.  
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)  
\*Available on "J" Style only

FINISH: ☐ Baked Powder (Std)  
☐ Baked Metallic (Opt'l)

##### ACCESSORIES:

- ☐ JV4 Overlapping Type  
☐ V4 Underlapping Type

##### ELEMENT:

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

One End Flared, (Std)

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

See Catalog for Working  
Pressures

#### ☐ V4 Wiped Edge Enclosure

**BACKPLATE:** Not Applicable

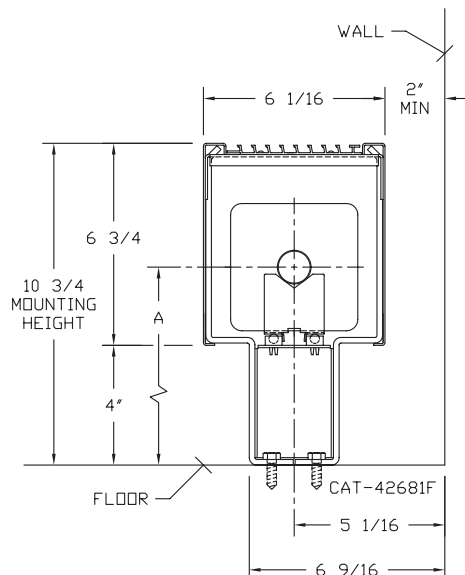
##### BRACKETS:

☐ Pedestal Brk't w/ B.B.  
Floor Mounted

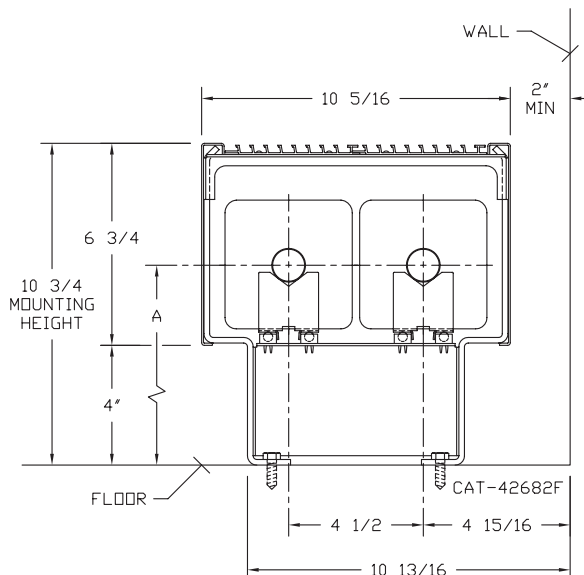
##### DAMPER:

☐ Slide Damper (Opt'l)

#### JV4-ARPM V4-ARPM (JV4 Shown)



#### JV4-ARPM2 V4-ARPM2 (JV4 Shown)



| 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                | 6 7/16  |
| 3/4" COPPER          | 4 1/4 x 4 1/4              | 3A               | 6 13/16 |
| 1" COPPER            | 3 5/8 x 4 1/4              | 2                | 6 5/8   |
| 1" COPPER            | 4 1/4 x 4 1/4              | 2                | 6 5/8   |
| 1 1/4" COPPER        | 3 5/8 x 4 1/4              | 2                | 6 3/4   |
| 1 1/4" COPPER        | 4 1/4 x 4 1/4              | 2                | 6 3/4   |
| 1" STEEL             | 4 1/4 x 4 1/4              | 2                | 6 3/4   |
| 1 1/4" STEEL         | 4 1/4 x 4 1/4              | 2                | 6 15/16 |
| 2" STEEL             | 4 1/4 x 4 1/4              | 1                | 6 11/16 |

**Vulcan**  
RADIATOR

260 North Elm St., Westfield, MA 01085  
(413) 568-9571 Fax: (413) 564-5661  
www.vulcanrad.com



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

STYLE JV4/V4-ARPM PM2

COPPER/ALUMINUM ELEMENT RATINGS

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>DEPTH<br>IN INCHES | ROWS<br>AND<br>CENTERS<br>IN INCHES | MTG.<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"         | VC3/4-433              | 3-5/8" x 4-1/4"            | 32                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1040                    | 890                                               | 810  | 720  | 630  | 550  | 470  | 420  | 340  | 270  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2080                    | 1790                                              | 1620 | 1440 | 1270 | 1100 | 940  | 830  | 690  | 540  |
| 3/4"         | VC3/4-434              | 3-5/8" x 4-1/4"            | 40                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1250                    | 1080                                              | 980  | 860  | 760  | 660  | 560  | 500  | 410  | 330  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2490                    | 2140                                              | 1940 | 1720 | 1520 | 1320 | 1120 | 1000 | 820  | 650  |
| 3/4"         | VC3/4-435              | 3-5/8" x 4-1/4"            | 50                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1380                    | 1190                                              | 1080 | 950  | 840  | 730  | 620  | 550  | 460  | 360  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2750                    | 2370                                              | 2150 | 1900 | 1680 | 1460 | 1240 | 1100 | 910  | 720  |
| 1"           | VC433                  | 3-5/8" x 4-1/4"            | 32                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1080                    | 930                                               | 840  | 750  | 660  | 570  | 490  | 430  | 360  | 280  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2170                    | 1870                                              | 1690 | 1500 | 1320 | 1150 | 980  | 870  | 720  | 560  |
| 1"           | VC434                  | 3-5/8" x 4-1/4"            | 40                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1210                    | 1040                                              | 940  | 830  | 740  | 640  | 540  | 480  | 400  | 310  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2430                    | 2090                                              | 1900 | 1680 | 1480 | 1290 | 1090 | 970  | 800  | 630  |
| 1"           | VC435                  | 3-5/8" x 4-1/4"            | 50                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1380                    | 1190                                              | 1080 | 950  | 840  | 730  | 620  | 550  | 460  | 360  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2750                    | 2370                                              | 2150 | 1900 | 1680 | 1460 | 1240 | 1100 | 910  | 720  |
| 1-1/4"       | VC1433                 | 3-5/8" x 4-1/4"            | 32                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1130                    | 970                                               | 880  | 780  | 690  | 600  | 510  | 450  | 370  | 290  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2250                    | 1940                                              | 1760 | 1550 | 1370 | 1190 | 1010 | 900  | 740  | 590  |
| 1-1/4"       | VC1434                 | 3-5/8" x 4-1/4"            | 40                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1240                    | 1070                                              | 970  | 860  | 760  | 660  | 560  | 500  | 410  | 320  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2480                    | 2130                                              | 1930 | 1710 | 1510 | 1310 | 1120 | 990  | 820  | 640  |
| 1-1/4"       | VC1435                 | 3-5/8" x 4-1/4"            | 50                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1380                    | 1190                                              | 1080 | 950  | 840  | 730  | 620  | 550  | 460  | 360  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2750                    | 2370                                              | 2150 | 1900 | 1680 | 1460 | 1240 | 1100 | 910  | 720  |
| 3/4"         | VC3/4-43               | 4-1/4" SQ.                 | 32                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1150                    | 990                                               | 900  | 790  | 700  | 610  | 520  | 460  | 380  | 300  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2300                    | 1980                                              | 1790 | 1590 | 1400 | 1220 | 1040 | 920  | 760  | 600  |
| 3/4"         | VC3/4-44               | 4-1/4" SQ.                 | 40                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1380                    | 1190                                              | 1080 | 950  | 840  | 730  | 620  | 550  | 460  | 360  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2750                    | 2370                                              | 2150 | 1900 | 1680 | 1460 | 1240 | 1100 | 910  | 720  |
| 3/4"         | VC3/4-45               | 4-1/4" SQ.                 | 50                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1420                    | 1220                                              | 1110 | 980  | 870  | 750  | 640  | 570  | 470  | 370  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2840                    | 2440                                              | 2220 | 1960 | 1730 | 1510 | 1280 | 1140 | 940  | 740  |
| 1"           | VC43                   | 4-1/4" SQ.                 | 32                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1150                    | 990                                               | 900  | 790  | 700  | 610  | 520  | 460  | 380  | 300  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2300                    | 1980                                              | 1790 | 1590 | 1400 | 1220 | 1040 | 920  | 760  | 600  |
| 1"           | VC44                   | 4-1/4" SQ.                 | 40                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1280                    | 1100                                              | 1000 | 880  | 780  | 680  | 580  | 510  | 420  | 330  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2560                    | 2200                                              | 2000 | 1770 | 1560 | 1360 | 1150 | 1020 | 840  | 670  |
| 1"           | VC45                   | 4-1/4" SQ.                 | 50                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1440                    | 1240                                              | 1120 | 990  | 880  | 760  | 650  | 580  | 480  | 370  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2890                    | 2490                                              | 2250 | 1990 | 1760 | 1530 | 1300 | 1160 | 950  | 750  |
| 1-1/4"       | VC143                  | 4-1/4" SQ.                 | 32                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1200                    | 1030                                              | 940  | 830  | 730  | 640  | 540  | 480  | 400  | 310  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2410                    | 2070                                              | 1880 | 1660 | 1470 | 1280 | 1080 | 960  | 800  | 630  |
| 1-1/4"       | VC144                  | 4-1/4" SQ.                 | 40                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1430                    | 1230                                              | 1120 | 990  | 870  | 760  | 640  | 570  | 470  | 370  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2860                    | 2460                                              | 2230 | 1970 | 1740 | 1520 | 1290 | 1140 | 940  | 740  |
| 1-1/4"       | VC145                  | 4-1/4" SQ.                 | 50                 | .020                          | 6 3/4                      | 1                                   | 10 3/4                      | 1470                    | 1260                                              | 1150 | 1010 | 900  | 780  | 660  | 590  | 490  | 380  |
|              |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2940                    | 2530                                              | 2290 | 2030 | 1790 | 1560 | 1320 | 1180 | 970  | 760  |

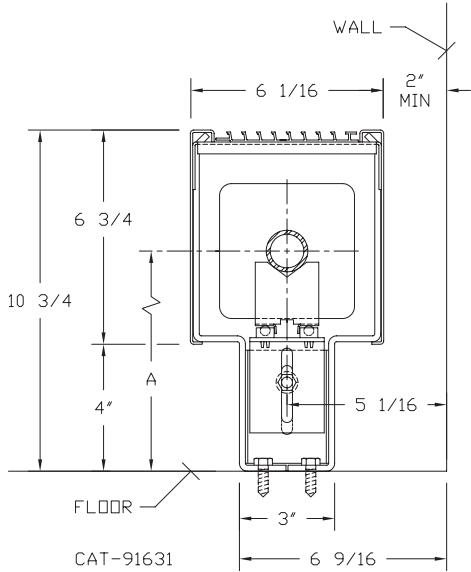
STEEL ELEMENT RATINGS

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

| I.P.S.<br>SIZE | CATALOG<br>DESIGNATION | FIN SIZE<br>HEIGHT X WIDTH | FINS<br>PER<br>FT. | FIN<br>THICKNESS<br>IN INCHES | ENCL<br>DEPTH<br>IN INCHES | ROWS<br>AND<br>CENTERS<br>IN INCHES | MTG.<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"             | VS43                   | 4-1/4" SQ.                 | 32                 | .032                          | 6 3/4                      | 1                                   | 10 3/4                      | 1140                    | 980                                               | 890  | 790  | 700  | 600  | 510  | 460  | 380  | 300  |
|                |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2270                    | 1950                                              | 1770 | 1570 | 1380 | 1200 | 1020 | 910  | 750  | 590  |
| 1"             | VS44                   | 4-1/4" SQ.                 | 40                 | .032                          | 6 3/4                      | 1                                   | 10 3/4                      | 1280                    | 1100                                              | 1000 | 880  | 780  | 680  | 580  | 510  | 420  | 330  |
|                |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2560                    | 2200                                              | 2000 | 1770 | 1560 | 1360 | 1150 | 1020 | 840  | 670  |
| 1"             | VS45                   | 4-1/4" SQ.                 | 50                 | .032                          | 6 3/4                      | 1                                   | 10 3/4                      | 1360                    | 1170                                              | 1060 | 940  | 830  | 720  | 610  | 540  | 450  | 350  |
|                |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2720                    | 2340                                              | 2120 | 1880 | 1660 | 1440 | 1220 | 1090 | 900  | 710  |
| 1-1/4"         | VS143                  | 4-1/4" SQ.                 | 32                 | .032                          | 6 3/4                      | 1                                   | 10 3/4                      | 1050                    | 900                                               | 820  | 720  | 640  | 560  | 470  | 420  | 350  | 270  |
|                |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2100                    | 1810                                              | 1640 | 1450 | 1280 | 1110 | 950  | 840  | 690  | 550  |
| 1-1/4"         | VS144                  | 4-1/4" SQ.                 | 40                 | .032                          | 6 3/4                      | 1                                   | 10 3/4                      | 1270                    | 1090                                              | 990  | 880  | 770  | 670  | 570  | 510  | 420  | 330  |
|                |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2550                    | 2190                                              | 1990 | 1760 | 1560 | 1350 | 1150 | 1020 | 840  | 660  |
| 1-1/4"         | VS145                  | 4-1/4" SQ.                 | 50                 | .032                          | 6 3/4                      | 1                                   | 10 3/4                      | 1330                    | 1140                                              | 1040 | 920  | 810  | 700  | 600  | 530  | 440  | 350  |
|                |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2670                    | 2300                                              | 2080 | 1840 | 1630 | 1420 | 1200 | 1070 | 880  | 690  |
| 2"             | VS242                  | 4-1/4" SQ.                 | 25                 | .032                          | 6 3/4                      | 1                                   | 10 3/4                      | 980                     | 840                                               | 760  | 680  | 600  | 520  | 440  | 390  | 320  | 250  |
|                |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 1960                    | 1690                                              | 1530 | 1350 | 1200 | 1040 | 880  | 780  | 650  | 510  |
| 2"             | VS243                  | 4-1/4" SQ.                 | 32                 | .032                          | 6 3/4                      | 1                                   | 10 3/4                      | 1280                    | 1100                                              | 1000 | 880  | 780  | 680  | 580  | 510  | 420  | 330  |
|                |                        |                            |                    |                               | 10 5/16                    | 2 - 4 1/2                           | "                           | 2560                    | 2200                                              | 2000 | 1770 | 1560 | 1360 | 1150 | 1020 | 840  | 670  |

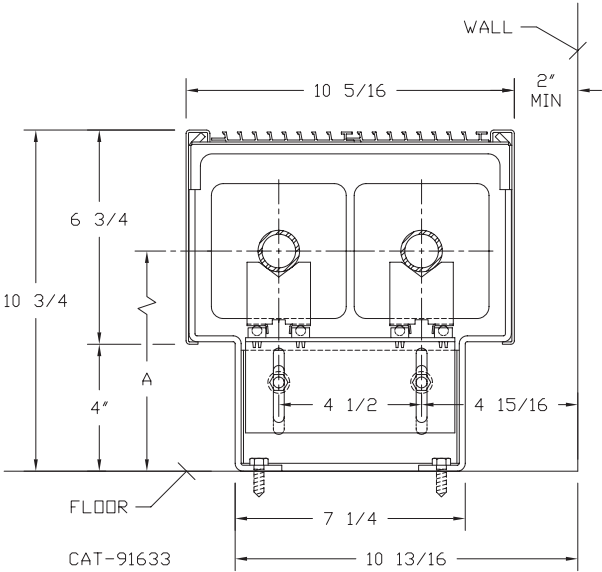
OPTIONAL ADJUSTABLE PEDESTAL BRACKET ASSEMBLIES FOR 2-PIPE STEAM

JV4-ARPM OR V4-ARPM



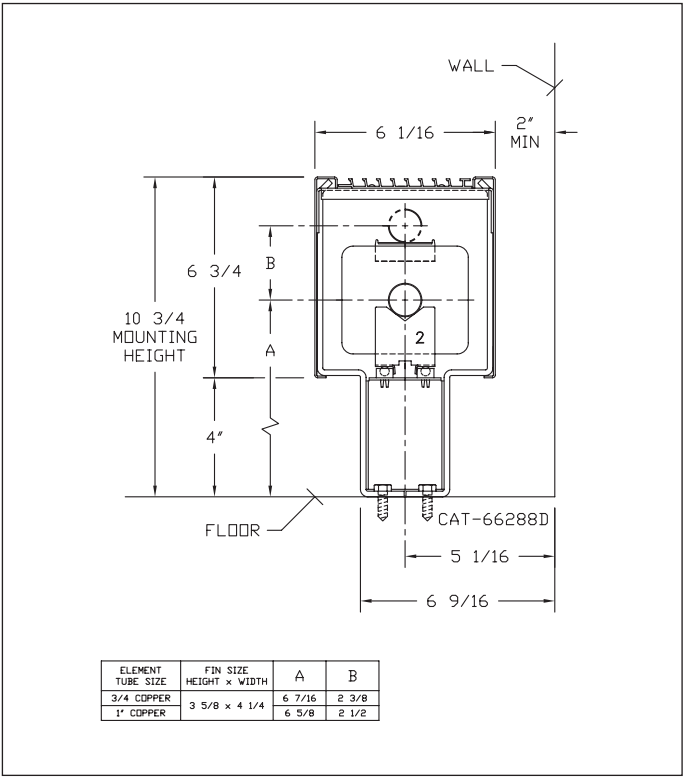
| ELEMENT<br>TUBE SIZE | FIN SIZE<br>HEIGHT x WIDTH | CRADLE<br>NUMBER | A<br>MIN | A<br>MAX |
|----------------------|----------------------------|------------------|----------|----------|
| 3/4" COPPER          | 3 5/8 x 4 1/4              | 2                | 6 1/2    | 7 13/16  |
| 3/4" COPPER          | 4 1/4 x 4 1/4              | 3A               | 6 11/16  |          |
| 1" COPPER            | 3 5/8 x 4 1/4              | 2                | 6 1/2    |          |
| 1" COPPER            | 4 1/4 x 4 1/4              | 2                |          |          |
| 1 1/4" COPPER        | 3 5/8 x 4 1/4              | 2                | 6 5/8    |          |
| 1 1/4" COPPER        | 4 1/4 x 4 1/4              | 2                |          |          |
| 1" STEEL             | 4 1/4 x 4 1/4              | 2                | 6 5/8    |          |
| 1 1/4" STEEL         | 4 1/4 x 4 1/4              | 2                | 6 3/4    |          |
| 2" STEEL             | 4 1/4 x 4 1/4              | 1                | 6 1/2    |          |

JV4-AR2PM OR V4-ARPM2

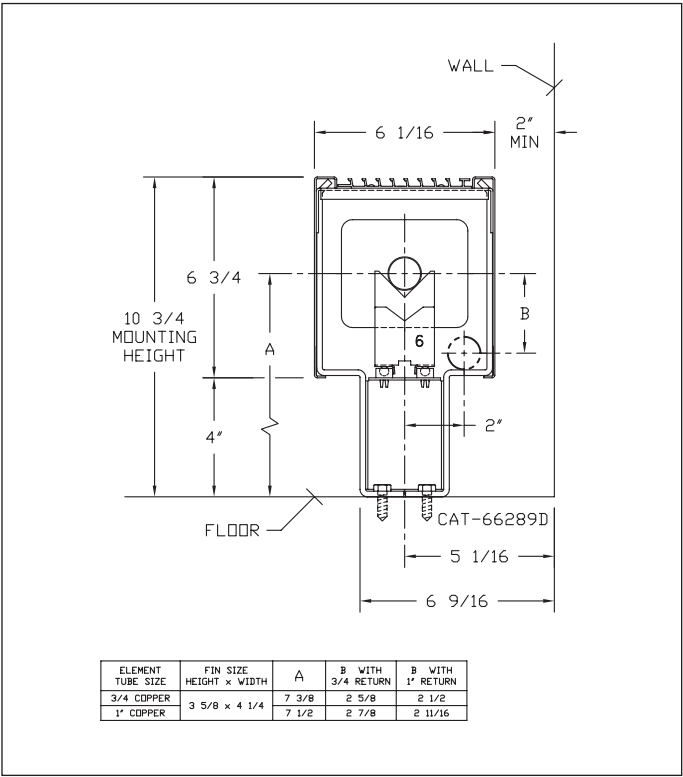


| ELEMENT<br>TUBE SIZE | FIN SIZE<br>HEIGHT x WIDTH | CRADLE<br>NUMBER | A<br>MIN | A<br>MAX |
|----------------------|----------------------------|------------------|----------|----------|
| 3/4" COPPER          | 3 5/8 x 4 1/4              | 2                | 6 1/2    | 7 13/16  |
| 3/4" COPPER          | 4 1/4 x 4 1/4              | 3A               | 6 11/16  |          |
| 1" COPPER            | 3 5/8 x 4 1/4              | 2                | 6 1/2    |          |
| 1" COPPER            | 4 1/4 x 4 1/4              | 2                |          |          |
| 1 1/4" COPPER        | 3 5/8 x 4 1/4              | 2                | 6 5/8    |          |
| 1 1/4" COPPER        | 4 1/4 x 4 1/4              | 2                |          |          |
| 1" STEEL             | 4 1/4 x 4 1/4              | 2                | 6 5/8    |          |
| 1 1/4" STEEL         | 4 1/4 x 4 1/4              | 2                | 6 3/4    |          |
| 2" STEEL             | 4 1/4 x 4 1/4              | 1                | 6 1/2    |          |

RETURN PIPING OPTIONS WITH 3/4" & 1" COPPER TUBE ELEMENTS



| ELEMENT<br>TUBE SIZE | FIN SIZE<br>HEIGHT x WIDTH | A      | B     |
|----------------------|----------------------------|--------|-------|
| 3/4" COPPER          | 3 5/8 x 4 1/4              | 6 7/16 | 2 3/8 |
| 1" COPPER            | 3 5/8 x 4 1/4              | 6 5/8  | 2 1/2 |



| ELEMENT<br>TUBE SIZE | FIN SIZE<br>HEIGHT x WIDTH | A     | B WITH<br>3/4" RETURN | B WITH<br>1" RETURN |
|----------------------|----------------------------|-------|-----------------------|---------------------|
| 3/4" COPPER          | 3 5/8 x 4 1/4              | 7 3/8 | 2 5/8                 | 2 1/2               |
| 1" COPPER            | 3 5/8 x 4 1/4              | 7 1/2 | 2 7/8                 | 2 11/16             |

## DESIGN DATA

## COMMERCIAL FINNED TUBE RATING CORRECTION CHARTS

**CATALOG FINNED TUBE RATINGS ARE BASED UPON THE FOLLOWING CONDITIONS:**

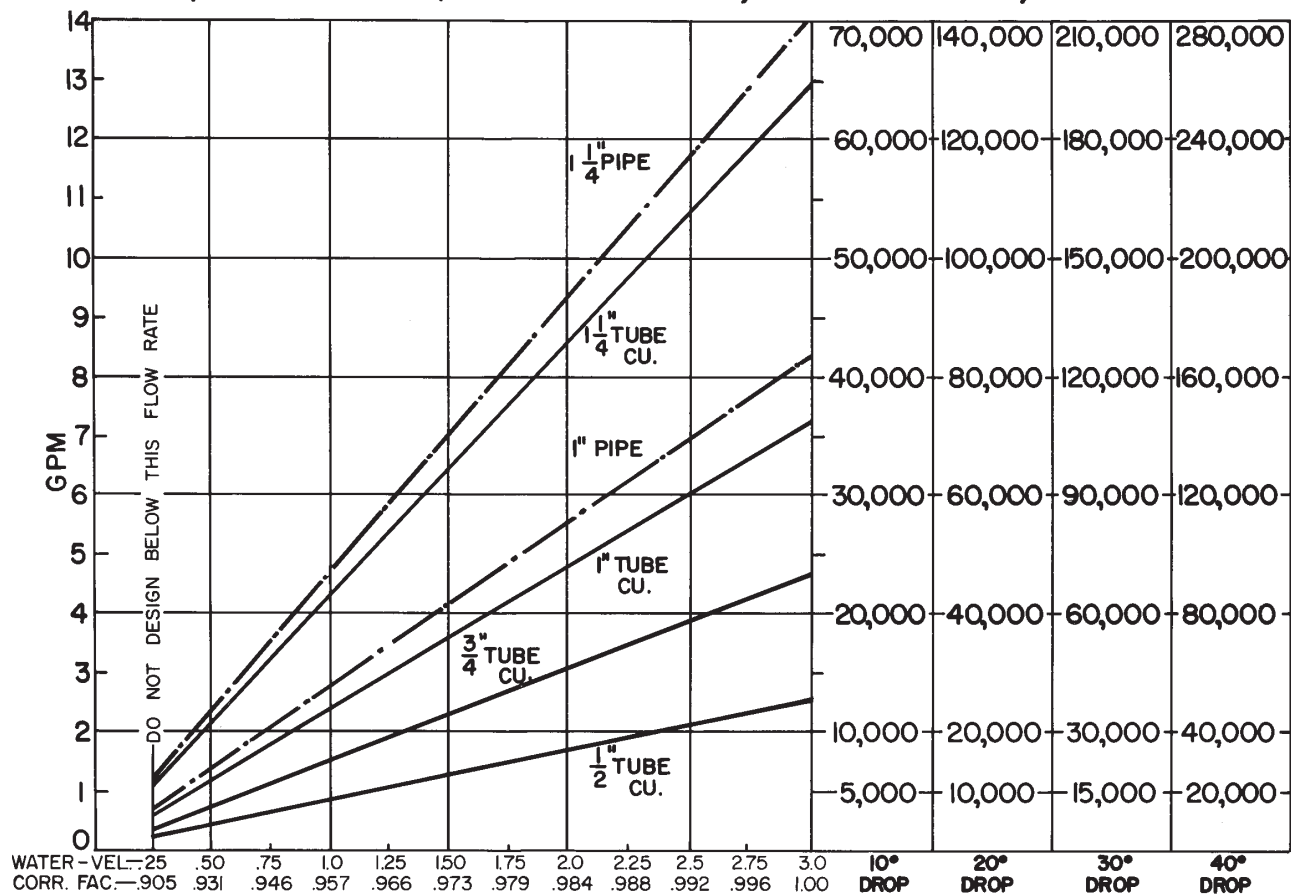
- 215°F AVERAGE WATER OR STEAM TEMPERATURE
- 65°F ENTERING AIR TEMPERATURE
- 3 FEET PER SECOND WATER FLOW RATE
- CATALOG MOUNTING HEIGHT

USE THE FOLLOWING CALCULATION WITH CORRECTION FACTORS FOR JOB CONDITIONS TO DETERMINE CORRECTED RATING:

$$\text{CORRECTED RATING} = (215^{\circ}\text{F CATALOG RATING}) \times \left( \frac{\text{CORRECTION FACTOR FOR STEAM OR WATER AND AVERAGE AIR TEMP.}}{\text{CORRECTION FACTOR FOR FLOW RATE}} \right) \times \left( \frac{\text{CORRECTION FOR MOUNTING HTG.-SEE CATALOG RATING}}{\text{CORRECTION FACTOR FOR FLOW RATE}} \right)$$

**USE THE FOLLOWING CHARTS TO SELECT CORRECTION FACTORS**

CHART/WATER VEL./CORR. FACTOR / PRESS. DROP/TOTAL BTU.

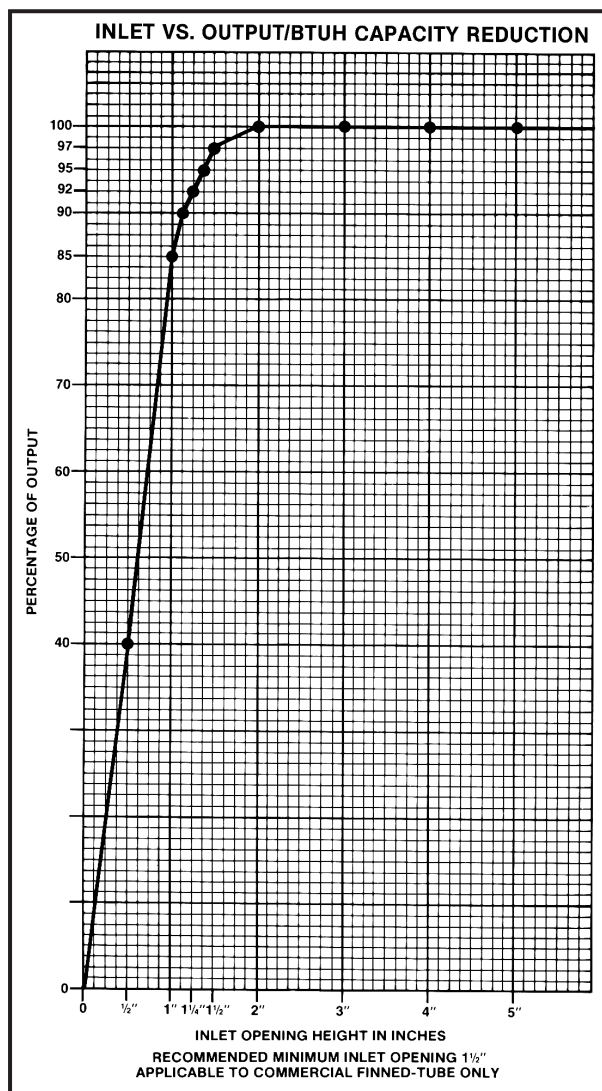


|                  |      |     |      |     |      |      |      |      |      |      |              |
|------------------|------|-----|------|-----|------|------|------|------|------|------|--------------|
| 1/2" COP ALUM.   | .180 |     | 2.33 |     | 5.33 |      | 9.16 |      |      |      |              |
| 3/4" COP ALUM.   | .5   |     | 1.5  |     | 3.16 |      | 5.4  |      | 6.25 |      |              |
| 1" COP ALUM.     | .233 | .41 | .83  |     | 1.45 | 2.16 | 2.83 |      | 3.66 |      |              |
| 1" PIPE          |      | .37 | .79  | 1.3 | 2.00 | 2.70 | 3.70 |      | 4.80 |      |              |
| 1 1/4" COP ALUM. | .16  | .33 | .55  | .79 | 1.08 | 1.33 | 1.8  | 2.25 | 2.26 | 2.91 | .33          |
| 1 1/4" PIPE      | .09  | .18 | .31  | .5  | .70  | 1.0  | 1.1  | 1.3  | 1.6  | 1.8  | 2.58 2.3 3.3 |

PRESSURE DROP PER  
100 LINEAR FT., IN  
FEET OF HEAD

## DESIGN DATA

### INLET AIR CORRECTION FACTOR



### GUARANTEED WORKING PRESSURES

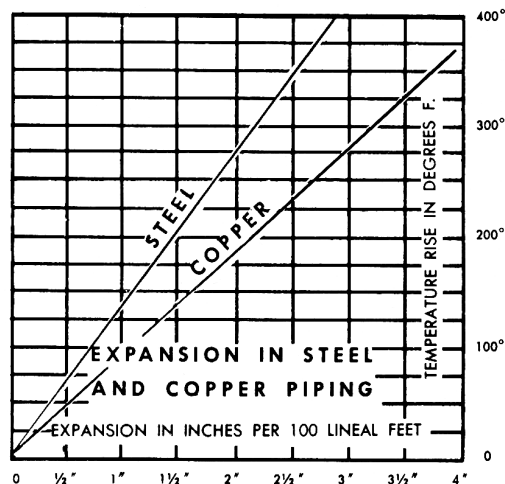
1" IPS — 780 AT TEMPERATURES UP TO 650°F.  
 1 1/4" IPS — 660 AT TEMPERATURES UP TO 650°F.  
 2" IPS — 405 AT TEMPERATURES UP TO 650°F.  
 1 1/4" CU — 194 AT TEMPERATURES UP TO 300°F.  
 1" CU — 204 AT TEMPERATURES UP TO 300°F.  
 3/4" CU — 218 PSI AT TEMPERATURES UP TO 300°F.  
 MAXIMUM PRESSURES AT OTHER TEMPERATURES  
 ARE AVAILABLE UPON REQUEST.

### RATE OF PITCH FOR STEAM 1/2" DROP OVER 20 FT. RUN.

| PIPE WATER CAPACITIES AND QUANTITIES<br>CIRCULATED AT VELOCITY OF 3* FEET PER SECOND |                         |                               |                             |
|--------------------------------------------------------------------------------------|-------------------------|-------------------------------|-----------------------------|
| Pipe Size                                                                            | Gals. Per<br>Linear Ft. | Gals./Min. @ 3'<br>Sec. Vel.* | Lbs./Hr. @ 3'<br>Sec. Vel.* |
| 1/2"                                                                                 | .016                    | 2.88                          | 1440                        |
| 3/4"                                                                                 | .023                    | 4.14                          | 2070                        |
| 1"                                                                                   | .040                    | 7.20                          | 3600                        |
| 1 1/4"                                                                               | .063                    | 11.34                         | 5660                        |
| 1 1/2"                                                                               | .102                    | 18.36                         | 9160                        |
| 2"                                                                                   | .170                    | 30.60                         | 15300                       |
| 2 1/2"                                                                               | .275                    | 49.50                         | 24850                       |
| 3"                                                                                   | .390                    | 70.20                         | 35000                       |

\*3 Ft./Sec. Velocity is Basic for Hot Water Rating Factors Shown on this Page.

$$\text{VELOCITY FT./SEC.} = \frac{\text{LBS. PER HOUR}}{(\text{GALS. PER FT.}) (3600) (8.3)}$$



### 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               |

## CORRECTION FACTORS FOR STEAM PRESSURES AND AIR TEMPERATURES OTHER THAN STANDARD

| STEAM        |          | ENTERING AIR TEMPERATURE, °F |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------|----------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Pressure     |          | Temp.                        |      |      | STD  |      |      |      |      |      |      |      |      |      |      |      |
| Gauge        | Abs. Psi | °F                           | 45   | 55   | 65   | 70   | 75   | 80   | 85   | 90   | 100  | 110  | 120  | 130  | 140  | 150  |
| (Vac) 15" Hg | 7.32     | 178.9                        | 0.90 | 0.80 | 0.70 | 0.65 | 0.60 | 0.56 | 0.51 | 0.45 | 0.39 | 0.32 | 0.25 | 0.18 | 0.13 | 0.08 |
| (Vac) 10"    | 9.78     | 192.2                        | 1.02 | 0.91 | 0.81 | 0.76 | 0.71 | 0.66 | 0.62 | 0.55 | 0.48 | 0.40 | 0.33 | 0.26 | 0.20 | 0.14 |
| (Vac) 5"     | 12.25    | 202.9                        | 1.11 | 1.00 | 0.90 | 0.85 | 0.79 | 0.75 | 0.70 | 0.63 | 0.56 | 0.48 | 0.40 | 0.33 | 0.27 | 0.20 |
| (Vac) 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    | 258.8                        | 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.

## CORRECTION FACTORS FOR WATER TEMPERATURES AND AIR TEMPERATURES OTHER THAN STANDARD

| AVERAGE WATER<br>TEMP. °F | ENTERING AIR TEMPERATURE, °F |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                           | 45                           | 55   | STD  | 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 |