

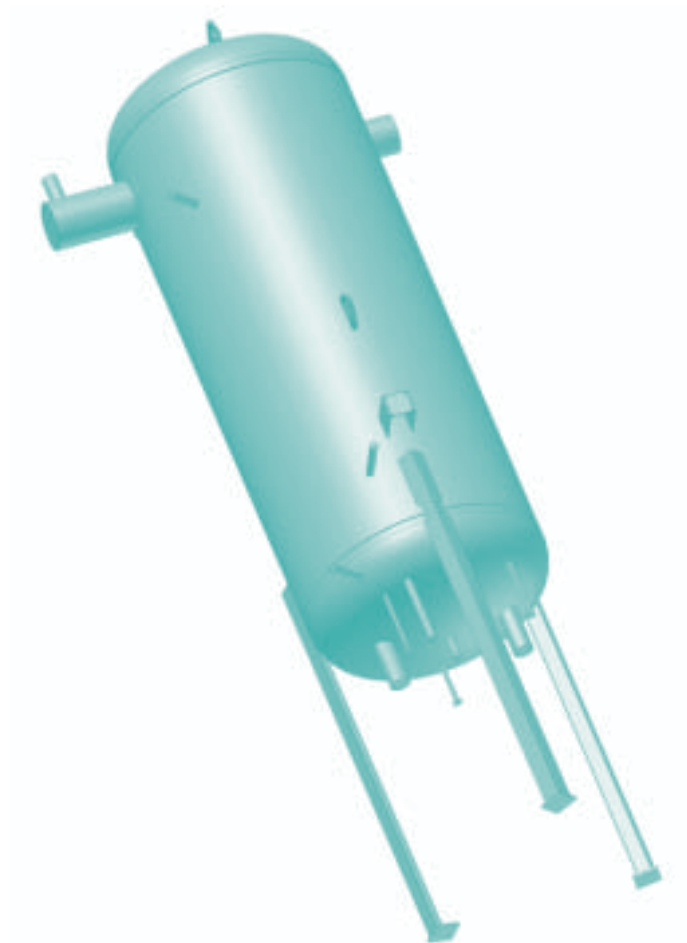


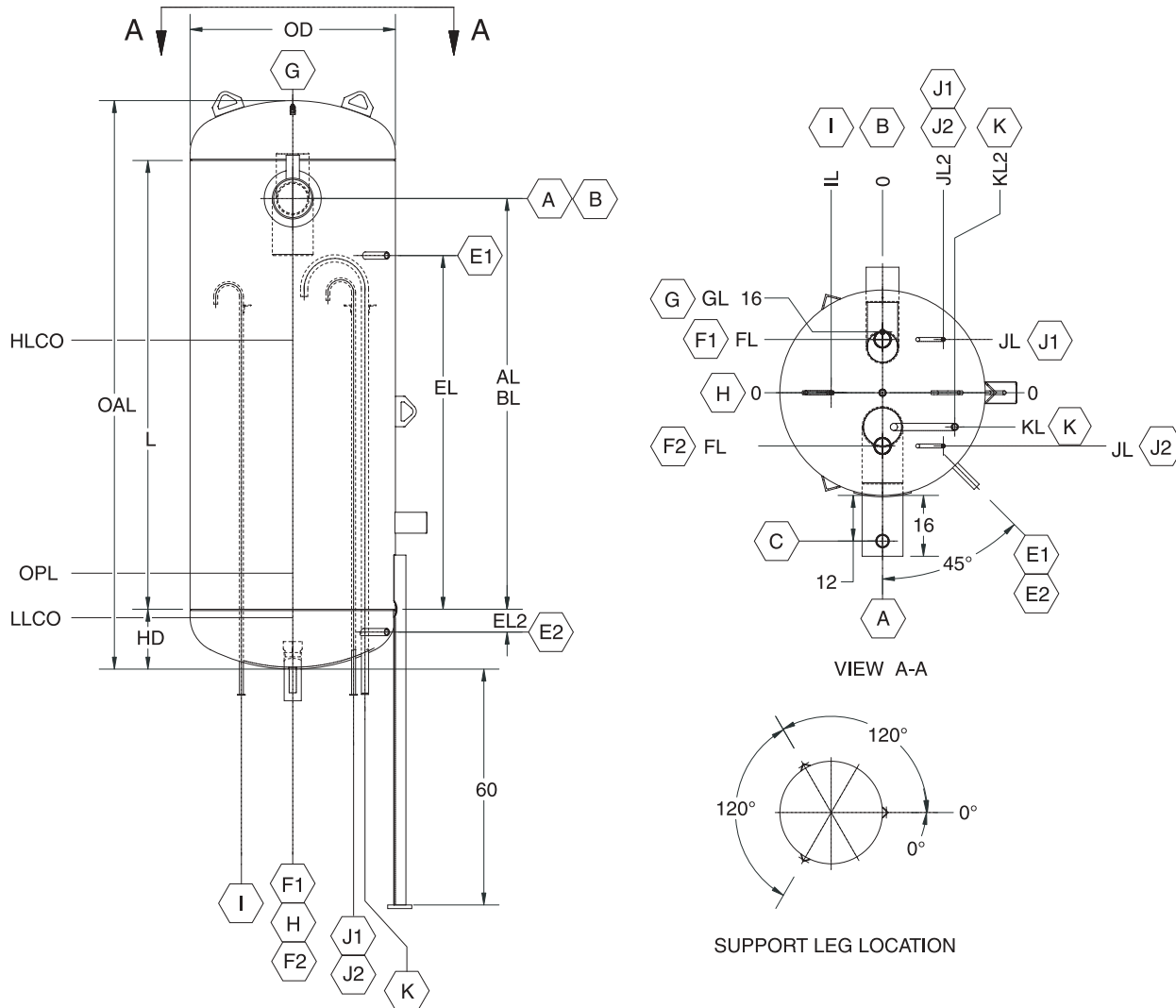
**E120-220 SED/JAN 2003**

|           |                                |
|-----------|--------------------------------|
| File:     | EQUIPMENT MANUAL - Section 120 |
| Replaces: | Nothing, New Information       |
| Dist:     | 1, 1a, 1b, 1c, 4, 4b, 4c       |

**Specifications - Engineering Data - Dimensions**

# *VERTICAL RECIRCULATORS*





**NOTES:**

1. All dimensions and nozzle nominal pipe sizes are given in inches unless noted otherwise.
2. Operating charge at OPL is based on ammonia @ +0°F RT having a density of 41.3654 lbf at this temperature.
3. Liquid makeup connection is on the top of the wet return connection. Wet return connection sized for concurrent return and liquid makeup flow.
4. Nozzles are sized for R-717 and should not be used with other refrigerants (e.g. R-22 & R-507).
5. Nozzle connections are supplied as pipe stubs unless otherwise specified as a coupling (Cplg).
6. Couplings are ASME B16.11 Class 3000 "full" couplings.
7. Use minimum 8-inch standoff on nameplate bracket.
8. All dimensions are subject to change; please consult factory for certified drawings.
9. Vessels are built in accordance with ASME Boiler & Pressure Vessel Code, Section VIII, Division 1.

**Key to Nozzle/Coupling Locations:**

|                       |                       |                          |
|-----------------------|-----------------------|--------------------------|
| A - Wet Return        | I - Oil Pot Vent      | LLCO - Low Level Cutout  |
| B - Gas Outlet        | J - Volute Vent/Bleed | OPL - Operating Level    |
| C - Liquid Makeup     | K - Liquid Bypass     | HLCO - High Level Cutout |
| E - Level Column      | OD - Outside Diameter |                          |
| F - Pump Suction      | HD - Head Depth       |                          |
| G - Relief (Coupling) | L - Shell Length      |                          |
| H - Oil Drain         | OAL - Overall Length  |                          |

**Figure 1. Data and Dimensions**

**VERTICAL RECIRCULATOR CAPACITIES R-717 <sup>(1)</sup>**

| Model No.                          | Operating Temperature    |       |       |       |                             |       |      |       |      |       |      |
|------------------------------------|--------------------------|-------|-------|-------|-----------------------------|-------|------|-------|------|-------|------|
|                                    | Two Stage <sup>(2)</sup> |       |       |       | Single Stage <sup>(3)</sup> |       |      |       |      |       |      |
|                                    | -50°F                    | -40°F | -30°F | -20°F | -20°F                       | -10°F | 0°F  | 10°F  | 20°F | 30°F  | 40°F |
| VRC-24-110                         | 51.9                     | 64.2  | 77.7  | 92    | 80                          | 92.6  | 104  | 119   | 134  | 147   | 158  |
| VRC-30-113                         | 82.8                     | 102   | 124   | 146   | 127                         | 147   | 167  | 191   | 214  | 235   | 252  |
| VRC-36-116                         | 119                      | 147   | 178   | 211   | 184                         | 213   | 240  | 275   | 308  | 339   | 363  |
| VRC-42-143                         | 163                      | 202   | 244   | 289   | 252                         | 291   | 329  | 377   | 423  | 464   | 492  |
| VRC-48-146                         | 212                      | 262   | 317   | 376   | 327                         | 378   | 427  | 489   | 549  | 603   | 646  |
| VRC-54-149                         | 269                      | 333   | 404   | 478   | 416                         | 481   | 543  | 622   | 698  | 766   | 822  |
| VRC-60-152                         | 334                      | 413   | 500   | 592   | 515                         | 596   | 674  | 771   | 865  | 950   | 1019 |
| VRC-72-158                         | 480                      | 595   | 720   | 852   | 741                         | 858   | 969  | 1109  | 1244 | 1366  | 1465 |
| VRC-84-164                         | 649                      | 804   | 973   | 1152  | 1002                        | 1159  | 1310 | 1499  | 1682 | 1847  | 1981 |
| VRC-96-170                         | 848                      | 1050  | 1271  | 1505  | 1308                        | 1514  | 1711 | 1958  | 2196 | 2412  | 2587 |
| Separation Velocity <sup>(4)</sup> | 227.5                    | 210   | 192.5 | 175   | 175                         | 157.5 | 140  | 127.5 | 115  | 102.5 | 90   |

1. Capacities are given in tons of refrigeration (R-717).
2. Two-stage capacities based on +35°F liquid feed temperature.
3. Single-stage capacities based on +95°F liquid feed temperature.
4. Separation velocities are given in feet per minute.

**DIMENSIONAL DATA**

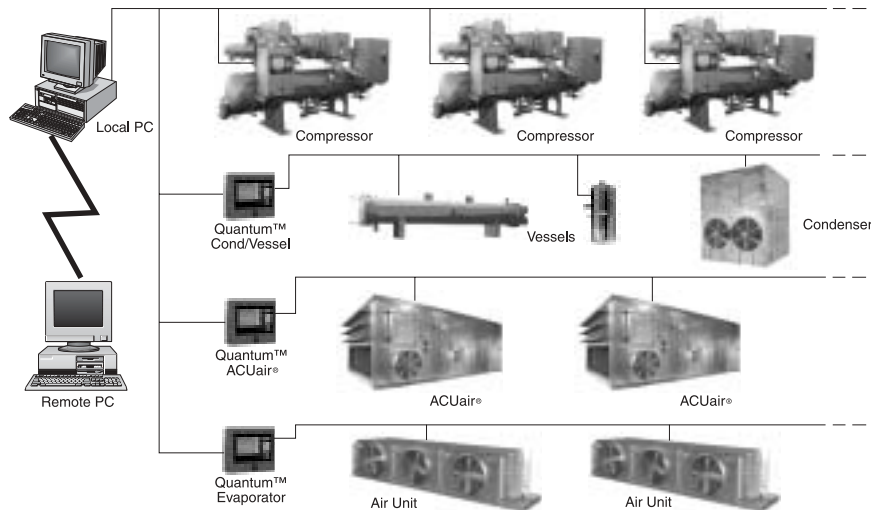
| Model Number | MAWP | OD | OAL                             | HD                               | L   | Dry Weight (lbf) | R-717 Operating Charge (lbf) | Surge Vol. (cu ft) | LLCO | OPL | HLCO | A  | B  |
|--------------|------|----|---------------------------------|----------------------------------|-----|------------------|------------------------------|--------------------|------|-----|------|----|----|
| VRC-24-110   | 250  | 24 | 110 <sup>3</sup> / <sub>8</sub> | 8 <sup>3</sup> / <sub>16</sub>   | 94  | 1,020            | 159.4                        | 10.56              | 8    | 18  | 61   | 5  | 4  |
| VRC-30-113   | 250  | 30 | 113 <sup>3</sup> / <sub>8</sub> | 9 <sup>11</sup> / <sub>16</sub>  | 94  | 1,310            | 244.3                        | 17.50              | 8    | 18  | 63   | 6  | 5  |
| VRC-36-116   | 250  | 36 | 116 <sup>3</sup> / <sub>8</sub> | 11 <sup>3</sup> / <sub>16</sub>  | 94  | 1,610            | 343.1                        | 27.11              | 8    | 18  | 66   | 8  | 6  |
| VRC-42-143   | 250  | 42 | 143 <sup>3</sup> / <sub>8</sub> | 12 <sup>11</sup> / <sub>16</sub> | 118 | 2,310            | 453.9                        | 56.46              | 10   | 18  | 91   | 8  | 6  |
| VRC-48-146   | 250  | 48 | 146 <sup>1</sup> / <sub>2</sub> | 14 <sup>1</sup> / <sub>4</sub>   | 118 | 3,590            | 564.1                        | 71.29              | 10   | 18  | 89   | 10 | 8  |
| VRC-54-149   | 250  | 54 | 149 <sup>1</sup> / <sub>2</sub> | 15 <sup>3</sup> / <sub>4</sub>   | 118 | 4,120            | 691.0                        | 91.92              | 10   | 18  | 90   | 10 | 8  |
| VRC-60-152   | 250  | 60 | 152 <sup>1</sup> / <sub>2</sub> | 17 <sup>1</sup> / <sub>4</sub>   | 118 | 4,670            | 823.5                        | 109.17             | 12   | 18  | 87   | 10 | 8  |
| VRC-72-158   | 250  | 72 | 158 <sup>5</sup> / <sub>8</sub> | 20 <sup>5</sup> / <sub>16</sub>  | 118 | 7,270            | 1645.0                       | 150.16             | 12   | 24  | 90   | 12 | 10 |
| VRC-84-164   | 250  | 84 | 164 <sup>3</sup> / <sub>4</sub> | 23 <sup>3</sup> / <sub>8</sub>   | 118 | 10,560           | 2095.4                       | 197.99             | 14   | 24  | 88   | 14 | 10 |
| VRC-96-170   | 250  | 96 | 170 <sup>3</sup> / <sub>4</sub> | 26 <sup>3</sup> / <sub>8</sub>   | 118 | 12,510           | 2917.2                       | 243.53             | 14   | 26  | 86   | 16 | 12 |

| Model No.  | C   | E  | F | G | H  | I | J | K  | AL   | BL  | EL   | EL2 | FL | GL  | IL   | JL | JL2 | KL | KL2 |
|------------|-----|----|---|---|----|---|---|----|------|-----|------|-----|----|-----|------|----|-----|----|-----|
| VRC-24-110 | 1½  | 1½ | 4 | ¾ | 1½ | ¾ | ¾ | 1¼ | 78 ½ | 89  | 57   | 3   | 9  | 7.5 | 10.5 | 9  | 6   | 7  | 6   |
| VRC-30-113 | 2   | 1½ | 5 | ¾ | 1½ | ¾ | ¾ | 1½ | 80 ½ | 88  | 57 ½ | 3   | 10 | 7.5 | 10.5 | 10 | 8   | 7  | 6   |
| VRC-36-116 | 2   | 1½ | 5 | ¾ | 1½ | ¾ | ¾ | 1½ | 85   | 88  | 73   | 6   | 10 | 10  | 10.5 | 10 | 9   | 9  | 9   |
| VRC-42-143 | 2 ½ | 1½ | 5 | ¾ | 1½ | ¾ | ¾ | 1½ | 109  | 112 | 96   | 3   | 12 | 11  | 10.5 | 12 | 12  | 9  | 14  |
| VRC-48-146 | 3   | 1½ | 5 | ¾ | 1½ | ¾ | ¾ | 1½ | 108  | 108 | 93   | 6   | 12 | 16  | 13.5 | 12 | 14  | 9  | 16  |
| VRC-54-149 | 3   | 1½ | 6 | ¾ | 1½ | ¾ | ¾ | 1½ | 108  | 108 | 93   | 6   | 14 | 16  | 13.5 | 14 | 16  | 9  | 18  |
| VRC-60-152 | 3   | 1½ | 6 | ¾ | 1½ | ¾ | ¾ | 1½ | 106  | 106 | 93   | 6   | 16 | 16  | 13.5 | 16 | 16  | 9  | 18  |
| VRC-72-158 | 4   | 1½ | 8 | 1 | 1½ | ¾ | ¾ | 2  | 106  | 106 | 89   | 10  | 18 | 20  | 13.5 | 18 | 16  | 9  | 18  |
| VRC-84-164 | 4   | 1½ | 8 | 1 | 1½ | ¾ | ¾ | 2  | 104  | 108 | 89   | 10  | 20 | 24  | 13.5 | 20 | 16  | 9  | 21  |
| VRC-96-170 | 5   | 1½ | 8 | 1 | 1½ | ¾ | ¾ | 2  | 102  | 106 | 87   | 12  | 24 | 24  | 13.5 | 24 | 16  | 9  | 24  |

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