Liebert®
DataMate™
System Design Catalog
1.5-ton to 3-ton (5-kW to 10.5-kW) Capacity,
Air, Water/Glycol, Chilled Water; 50 and 60 Hz
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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures. Visit https://www.VertivCo.com/en-us/support/ for additional assistance.
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1 INTRODUCTION

1.1 Designed to Match Computer and Electronic Equipment Needs—from Installation to Operation

Installed on the floor or on the wall, Liebert® DataMate Thermal Management systems control the cooling, humidity and air distribution required by sensitive electronic equipment. A range of sizes and configurations is available to meet varying site needs.

The Liebert® DataMate is also easy to use. Advanced microprocessor technology allows easy, precise control, and menu-driven monitoring keeps you informed of system operation through the LCD readout. These features, combined with Vertiv quality construction and reliable components, guarantee satisfaction from installation through operation.

Liebert® Thermal Management

Liebert® Thermal Management systems control the temperature and humidity required for computers and other sensitive electronic equipment. The Liebert® DataMate provides complete control on an around-the-clock basis and the high sensible-heat ratio required by sensitive electronic equipment.

Easy Installation

The Liebert® DataMate is a split-system evaporator combined with a remote air-, water- or glycol-cooled condensing unit, a close-coupled water/glycol condensing unit, or is a self-contained, chilled-water unit. Each split system has thermostat-type wiring to controls and condensing unit.

Easy to Service

Low-maintenance components are easily accessed through removable front panels. Routine maintenance service can be performed quickly and easily. Spare parts are always in Vertiv inventory and available on short notice.

Advanced Control Technology

A menu-driven microprocessor control system provides precise temperature and humidity control and accurate alarm setpoints. Using touch-sensitive buttons, the wall-mounted monitor/control panel allows you to select and display temperature and other monitored parameters.

High Efficiency

High sensible heat ratio, scroll compressor, and precise microprocessor control allow the system to operate efficiently.

Space-saving Design

Models available to fit in any room without disrupting work-station layout. Units require 5 ft² (0.5 m²) or less of floor space or may be mounted on a wall.

Reliable

The Liebert® DataMate family installed base is a testimony to the system reliability.
1.2 AHRI Certified

The Liebert® DataMate™ 60-Hz system is AHRI Certified™, the trusted mark of performance assurance for heating, ventilation, air conditioning and commercial refrigeration equipment, using AHRI Standard 1360.

1.3 Agency Listed

Standard 60-Hz units are CSA Certified to the harmonized U.S. and Canadian product safety standard CSA C22.2 No 236/UL 1995 for “Heating and Cooling Equipment” and are marked with the CSA c-us logo.
2 FEATURES AND OPTIONS

2.1 Standard Features

2.1.1 Evaporator Section—Split Systems

The DataMate systems consist of an evaporator section matched with an outdoor air-cooled condensing unit, indoor air-cooled condensing unit or indoor water/glycol-cooled condensing unit.

The evaporator unit includes an evaporator coil, filter-drier, expansion valve, two-speed centrifugal blower assembly, galvanized-steel drain pan, cleanable filters, and microprocessor control with wall-mounted display panel. The floor- or wall-mounted unit is constructed of galvanized-steel with powder-coated, removable exterior panels. A reversible discharge grille lets you redirect airflow. The system is designed for R-407C refrigerant. Suction and liquid lines are spun closed, and filled with an inert gas holding charge.

2.1.2 Condensing Unit Section—Remote Split Systems

Outdoor Air-cooled Condensing Units

The outdoor prop-fan condensing unit includes scroll compressor, condenser coil, propeller fan, liquid-line solenoid valve, high-pressure switch, Liebert® Lee-Temp head-pressure control, and hot-gas bypass. The condensing unit is designed for R-407C refrigerant and operates in outdoor locations at ambient temperatures ranging from -30°F to 95°F (-34°C to 35°C). Suction and liquid lines are spun closed, and filled with an inert gas holding charge.

Indoor Air-cooled Condensing Units

Indoor, air-cooled, centrifugal-fan condensing units include scroll compressor, condenser coil, factory-mounted disconnect switch, belt-driven centrifugal blower assembly, high-pressure switch, Liebert® Lee-Temp™ head-pressure control system, hot-gas bypass and liquid-line solenoid valve. Unit must be mounted indoors. Condensing unit is designed for R-407C refrigerant and will operate with outdoor air temperatures ranging from -30°F to 95°F (-34°C to 35°C). Suction and liquid lines are spun closed, and filled with an inert gas holding charge. Available in 2-ton and 3-ton models.

Indoor Water/Glycol-cooled Condensing Units

Indoor Remote Water/Glycol Condensing Units include scroll compressor, factory-mounted disconnect, coaxial condenser, hot-gas bypass, high-head-pressure switch, and two-way water/glycol-regulating valve designed for 150 psi (1034.3 kPa). Condensing unit is designed for R-407C refrigerant and can be used on a water or glycol cooling loop. Suction and liquid lines are spun closed, and filled with an inert gas holding charge.

2.1.3 Condensing Unit Section—Close-coupled

The Close-coupled Water/Glycol Condensing Unit attaches to the split-system evaporator to become a single wall- or floor-mounted unit.

Indoor close-coupled water/glycol condensing units include scroll compressor, brazed-plate condenser and 2-way water-regulating valve. Unit is available in 60-Hz models only. Design water/glycol pressure is 150 psi (1034 kPa). Suction and liquid lines are spun closed, and filled with an inert gas holding charge.

2.1.4 Chilled-water Units

Chilled-water models are self-contained and include a chilled-water coil, two-speed, centrifugal blower, two-way, solenoid-open, slow-close, (On/Off) spring-return valve, cleanable filters, and microprocessor control with wall-mounted display panel. Design pressure is 300 psi (2068 kPa), 60 psi (414 kPa) close-off differential.
2.1.5 System Controls

System controls include a microprocessor control board mounted in the evaporator/chilled water unit and a wall-mounted interface with a two-line, 16-character liquid crystal display. An eight-key, membrane keypad for setpoint/program control, unit On/Off, fan speed, and alarm silence is below the LCD screen. It provides temperature setpoint and sensitivity adjustment, humidity setpoint and sensitivity adjustment, digital display of temperature, humidity, setpoints, sensitivities, fan speed, and alarm conditions.

The wall-box is field-wired to the microprocessor control using standard four-conductor, shielded thermostat wire (field-supplied). The temperature and humidity sensors are in the wall box, which can be installed up to 300 ft (91.4 m) from the evaporator unit when using a remote temperature/humidity sensor in the conditioned space. The unit-mounted control board also includes common-alarm terminals and shut-down terminals. The unit automatically restarts after a power outage.

**Figure 2.1 Wall-box**

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**Other Standard Control Features**

- Adjustable auto restart
- 5 day/2 day setback
- Password protection
- Alarm enable/disable
- Self-diagnostics
- Calibrate sensors
- Predictive humidity control
- Common alarm output
- Remote shut-down terminals
2.2 Optional Factory-Installed Features

2.2.1 Evaporator/Chilled-water Unit Options

**Reheat**

Electric Reheat includes a low-watt, tubular reheat element with non-corrosive metal sheath provides single-stage, non-ionizing to maintain room dry-bulb temperature.

**Humidifier/Reheat**

Humidifier/Electric-reheat Package is available for complete humidity control. The canister humidifier includes a steam-generating type humidifier with automatic flushing circuit, inlet strainer, drain, 1-in. (25.4 mm) air gap on fill line and solenoid valves. Humidifier problem alarm annunciates at the wall-mounted display panel. Maximum humidifier water supply pressure is 150 psi (1034 kPa).

2.2.2 Optional Configurations—Prop Fan Condensing Units

Outdoor Prop Fan Condensing Units are available in the following optional configurations:

- High-ambient models for providing catalog capacities at ambient temperatures up to 105°F (40°C).
- Liebert® Quiet-Line™ models for low-noise-level conditions (below 58 dBA) and for providing catalog capacities at ambient temperatures up to 95°F (35°C).
- Condenser coils can be phenolic-coated for extended coil life in coastal areas.

2.2.3 Optional Configurations—Water/Glycol Condensing Units

Remote Water/Glycol Condensing Units are available with the following piping options:

- Two-way water-regulating valve with 350 psi (2413 kPa) design pressure.
- Three-way water-regulating valve with 150 psi (1034 kPa) design pressure.
- Three-way water-regulating valve with 350 psi (2413 kPa) design pressure.
2.3 Ship-Loose Accessories—Field-Installed

The Condensate Pump is field-mounted inside the unit and wired to the unit power block or field-mounted outside the unit with power from unit or external power supply. Pump is complete with integral float switch, discharge check valve, pump, motor assembly and reservoir. A secondary float can be field-wired to shut down the unit upon high condensate level.

The Canister Humidifier Kit may be field-installed to customize cooling-only or reheat-only units. The kit includes full installation instructions and is added to the evaporator unit before it is mounted on its wall or floor location.

A Remote Temperature and Humidity Sensor package includes sensors in an attractive case with 30 ft (9 m) of cable. Can be wall- or duct-mounted. Remote sensors must be used when the wall box is not located in the space to be conditioned.

NOTE: Installing the remote sensors disables the sensors included in the wall box.

The 277-V Step-Down Transformer is available for units that need 277-1-60 input power; one each for evaporator section and remote-condensing section (37.5 A max. each). Use one 37.5 A transformer for 1.5- or 2-ton self-contained water/glycol systems; use 50 A transformer for 3-ton self-contained water/glycol systems. Epoxy-encapsulated, transformer is suitable for either indoor or outdoor service.

2.3.1 Remote Monitoring, Autochangeover, and Leak Detection Equipment

The Liebert® iCOM CMS—provides mobile-cloud access, remote access to the unit-level display via the world-wide web, and building-management system (BMS) access via BACnet/Modbus IP and BACnet/Modbus 485. Wall-mounted enclosure contains CMS card powered from included 120VAC to 24VAC wall outlet transformer and 6ft (1.8m) wire harness. Separate 120VAC power source required.

The Liebert® RCM4™ is a four-point, normally-open, dry-contact monitoring panel. One Form-C, dry-contact common-alarm-relay output (rated at 24 VAC, 3 Amp) is provided. Four red LEDs illuminate on the respective alarm and the alarm buzzer is silenced by a front-panel switch. The RCM4 requires a 24-VAC or 24-IVDC power source. Power supply is not included.

The Liebert® Liqui-tect™ 410 Point Leak-Detection Sensor detects the presence of conductive liquid using a pair of corrosion-resistant, gold-plated probes mounted in a painted, height-adjustable enclosure. Dual, Form-C, dry-contact common-alarm relays (rated at 24 VAC, 3 A) signal a leak detected as well as loss of power and cable fault. The Liebert® Liqui-tect 410 requires an external 24-VAC or 24-IVDC power source.

Liebert® Liqui-tect™ 460 Zone Leak-Detection Kits include one LT460 sensor, a specified length of LT500-xxY cable (maximum length is 100 ft [30.5 m]) and a corresponding number of hold-down clips. The Liebert® LT460 requires an external 24-VAC, 0.12-A power source such as EXT-XFMR or XFMR24.

Liebert® SiteScan™ is a monitoring solution that gives you decision-making power to effectively manage the equipment critical to your business.

Liebert® SiteScan enables communication from Liebert® thermal-management and power units, as well as many other pieces of analog or digital equipment, to a front-end software package that provides real-time status and alarms so you can react quickly to changing situations.

Liebert® SiteScan is designed with flexibility for both small systems and large, complex systems such as those in computer rooms, telecommunications facilities, or industrial process-control rooms. Contact your local Vertiv representative for assistance with a Liebert® SiteScan system.

The NIC-ENCL1 and NIC-ENCL2 package one or two Liebert® IntelliSlot™ Web/485 Cards with Adapters, respectively, in one steel enclosure for installation external to the DataMate. The IntelliSlot Web/485 Card with Adapter provides communication with DataMate via SNMP, HTTP, RTU Modbus 485 and BACnet IP. The self-contained kit includes an external 120VAC-to-24VAC transformer as a power source. Wiring harnesses are not provided. Power and communication wiring is field-provided.
3 NOMENCLATURE

This section describes the model-number configuration for Liebert® DataMate units and components.

3.1 System Configurations

The following figures show the available capacity and cooling options for the Liebert® DataMate.

Figure 3.1 Air-cooled Units

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air-cooled with outdoor condensing unit suitable for installation on a roof or at ground level.</td>
</tr>
<tr>
<td>2</td>
<td>Air-cooled with indoor condensing unit for applications where roof or other outdoor locations are impractical.</td>
</tr>
</tbody>
</table>
### Figure 3.2 Water/Glycol-cooled Units

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water/Glycol-cooled with close-coupled condensing unit conveniently needs only a single power-supply and water-supply connection installed.</td>
</tr>
<tr>
<td>2</td>
<td>Water/Glycol-cooled with remote, indoor condensing unit that installs under the raised floor or above the dropped ceiling.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td>Chilled-water cooled connects quickly and easily to a chilled-water loop for ease of installation.</td>
</tr>
</tbody>
</table>
### 3.2 Nomenclature for Evaporator and Chilled-water Units

Table 3.2 below describes each digit of the model number.

#### Table 3.1 Nomenclature Example

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>E</td>
</tr>
<tr>
<td>8</td>
<td>—</td>
</tr>
<tr>
<td>9</td>
<td>P</td>
</tr>
<tr>
<td>10</td>
<td>H</td>
</tr>
<tr>
<td>11</td>
<td>N</td>
</tr>
</tbody>
</table>

Table 3.2 Nomenclature Digit Definitions for Evaporator and Chilled-water Units

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Digits 1, 2, 3 = the base unit</td>
</tr>
<tr>
<td></td>
<td>DME = DataMate evaporator/chilled-water cooling unit</td>
</tr>
<tr>
<td></td>
<td>Digits 4, 5, 6 = Nominal Capacity, kBtu/h</td>
</tr>
<tr>
<td>Digit 7, 8</td>
<td>Cooling type</td>
</tr>
<tr>
<td></td>
<td>C = Chilled-water cooled</td>
</tr>
<tr>
<td></td>
<td>E = Evaporator</td>
</tr>
<tr>
<td>Digit 9</td>
<td>Supply power</td>
</tr>
<tr>
<td></td>
<td>P = 208/230 V / 1 ph / 60 Hz</td>
</tr>
<tr>
<td></td>
<td>W = 200/220 V / 1 ph / 50 Hz</td>
</tr>
<tr>
<td>Digit 10</td>
<td>Reheat and Humidification</td>
</tr>
<tr>
<td></td>
<td>0 = Reheat only</td>
</tr>
<tr>
<td></td>
<td>C = Cooling only</td>
</tr>
<tr>
<td></td>
<td>H = Reheat and Humidifier</td>
</tr>
<tr>
<td>Digit 11</td>
<td>Refrigerant/Revision</td>
</tr>
<tr>
<td></td>
<td>N = R-407C, field-supplied, field-charged (evaporator)</td>
</tr>
<tr>
<td></td>
<td>7 = Revision (chilled-water)</td>
</tr>
</tbody>
</table>
3.3 Nomenclature for Condensing units

This section describes the model-number configuration for DataMate condensing units.

3.3.1 Outdoor Prop-fan Condensing Units for Air-cooled Systems

Table 3.4 below describes each digit of the model number.

Table 3.3 Prop-fan Condensing Unit Nomenclature Example

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
</tr>
<tr>
<td>3</td>
<td>H</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>A</td>
</tr>
<tr>
<td>8</td>
<td>—</td>
</tr>
<tr>
<td>9</td>
<td>P</td>
</tr>
<tr>
<td>10</td>
<td>L</td>
</tr>
<tr>
<td>11</td>
<td>N</td>
</tr>
</tbody>
</table>

Table 3.4 Nomenclature Digit Definitions for Outdoor, Prop-fan Condensing Units

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3 = the base unit</td>
<td>PFH = Prop-fan condensing unit with hot-gas bypass</td>
</tr>
<tr>
<td>4 = Sound level</td>
<td>0 = Standard</td>
</tr>
<tr>
<td></td>
<td>Z = Quiet-Line</td>
</tr>
<tr>
<td>5 and 6 = Nominal Capacity, kBtuh</td>
<td></td>
</tr>
<tr>
<td>7 = Cooling type</td>
<td>A = Air-cooled</td>
</tr>
<tr>
<td>8 = Coil type</td>
<td>— = Standard coil</td>
</tr>
<tr>
<td></td>
<td>C = Coated coil</td>
</tr>
<tr>
<td>9 = Supply power</td>
<td>A = 460 V / 3 ph / 60 Hz</td>
</tr>
<tr>
<td></td>
<td>B = 575 V / 3 ph / 60 Hz</td>
</tr>
<tr>
<td></td>
<td>M = 380/415 V / 3 ph / 50 Hz</td>
</tr>
<tr>
<td></td>
<td>P = 208/230 V / 1 ph / 60 Hz</td>
</tr>
<tr>
<td></td>
<td>S = 220 V / 1 ph / 50 Hz</td>
</tr>
<tr>
<td></td>
<td>Y = 208/230 V / 3 ph / 60 Hz</td>
</tr>
<tr>
<td>10 = Ambient rating/Control</td>
<td>L = 95°F Ambient, Liebert® Lee-Temp™</td>
</tr>
<tr>
<td></td>
<td>H = 105°F Ambient, Liebert® Lee-Temp™</td>
</tr>
<tr>
<td>11 = Refrigerant</td>
<td>N = R-407C field-charged</td>
</tr>
</tbody>
</table>
3.3.2 Indoor Condensing Units for Air-cooled Systems

Table 3.6 below describes each digit of the model number.

Table 3.5 Indoor, Air-cooled Condensing Unit Nomenclature Example

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
</tr>
<tr>
<td>2</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>7</td>
<td>L</td>
</tr>
<tr>
<td>8</td>
<td>A</td>
</tr>
<tr>
<td>9</td>
<td>H</td>
</tr>
<tr>
<td>10</td>
<td>N</td>
</tr>
</tbody>
</table>

Table 3.6 Nomenclature Digit Definitions for Indoor, Air-cooled Condensing Units

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digits 1 to 2 = the base unit</td>
<td>MC = Mini-Mate2-style condensing unit</td>
</tr>
<tr>
<td>Digit 3 = Disconnect</td>
<td>D = Disconnect switch</td>
</tr>
<tr>
<td>Digit 4 and 5 = Nominal Capacity</td>
<td>24 = 24 kBTU, 2-ton, 60 Hz</td>
</tr>
<tr>
<td></td>
<td>35 = 35 kBTU, 3-ton, 50 Hz</td>
</tr>
<tr>
<td></td>
<td>36 = 36 kBTU, 3-ton, 60 Hz</td>
</tr>
<tr>
<td>Digit 6 = Cooling type</td>
<td>A = Air-cooled</td>
</tr>
<tr>
<td>Digit 7 = Head-pressure control</td>
<td>L = Liebert® Lee-Temp™ Receiver</td>
</tr>
<tr>
<td>Digit 8 = Supply power</td>
<td>A = 460 V / 3 ph / 60 Hz</td>
</tr>
<tr>
<td></td>
<td>M = 380/415 V / 3 ph / 50 Hz</td>
</tr>
<tr>
<td></td>
<td>P = 208/230 V / 1 ph / 60 Hz</td>
</tr>
<tr>
<td></td>
<td>S = 220 V / 1 ph / 50 Hz</td>
</tr>
<tr>
<td></td>
<td>X = 277 V / 1 ph / 50 Hz</td>
</tr>
<tr>
<td></td>
<td>Y = 208/230 V / 3 ph / 60 Hz</td>
</tr>
<tr>
<td>Digit 9 = Hot-gas bypass</td>
<td>H = Hot-gas bypass</td>
</tr>
<tr>
<td>Digit 10 = Refrigerant</td>
<td>N = R-407C field-charged</td>
</tr>
</tbody>
</table>
3.3.3 Close-coupled Condensing Unit for Water/Glycol-cooled Systems

Table 3.8 below describes each digit of the model number.

Table 3.7 Close-coupled Water/Glycol Condensing Unit Nomenclature Example

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>G</td>
</tr>
<tr>
<td>8</td>
<td>P</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>N</td>
</tr>
</tbody>
</table>

Table 3.8 Nomenclature Digit Definitions for Close-coupled Water/Glycol Units

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1     | Digits 1, 2, 3 = the base unit  
DMC = DataMate condensing unit |
|       | Digits 4, 5, 6 = Nominal Capacity, kBtuh |
|       | Digit 7, 8 = Cooling type  
WG = Water/Glycol cooled |
|       | Digit 9 = Supply power  
P = 208/230 V / 1 ph / 60 Hz |
|       | Digits 10, 11 = Refrigerant  
0N = R-407C, field-supplied, field-charged |
3.3.4 Remote, Indoor Water/Glycol-cooled Condensing Units

Table 3.10 below describes each digit of the model number.

<table>
<thead>
<tr>
<th>Digit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MC = Mini-Mate2-style condensing unit</td>
</tr>
<tr>
<td>2</td>
<td>D = Disconnect switch</td>
</tr>
<tr>
<td>3</td>
<td>Disconnect</td>
</tr>
<tr>
<td>4</td>
<td>Nominal Capacity, kBtuh</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Cooling type</td>
</tr>
<tr>
<td>7</td>
<td>Head-pressure control</td>
</tr>
<tr>
<td>8</td>
<td>Supply power</td>
</tr>
<tr>
<td>9</td>
<td>Hot-gas bypass</td>
</tr>
<tr>
<td>10</td>
<td>Refrigerant</td>
</tr>
</tbody>
</table>

Vertiv | Liebert® DataMate™ System Design Catalog
### 4 SYSTEM DATA

#### 4.1 Air-Cooled Systems—Capacity and Performance Data

**Table 4.1 Air-cooled Data, 60-Hz**

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>DME020E</th>
<th>DME027E</th>
<th>DME037E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensing Unit Type</td>
<td>PFH - Outdoor</td>
<td>PFH - Outdoor</td>
<td>MCD - Indoor</td>
</tr>
<tr>
<td><strong>DX Evaporator - Net Capacity Data - kW (Btuh) @ High Speed CFM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80°F DB, 62.8°F WB (26.7°C DB, 17.1°C WB) 38 %RH</td>
<td>Total</td>
<td>5.50 (18,800)</td>
<td>7.20 (24,500)</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>5.50 (18,800)</td>
<td>7.20 (24,500)</td>
</tr>
<tr>
<td>75°F DB, 61°F WB (23.9°C DB, 16.1°C WB) 45 %RH</td>
<td>Total</td>
<td>6.10 (17,400)</td>
<td>6.70 (22,800)</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>5.05 (17,200)</td>
<td>6.65 (22,700)</td>
</tr>
<tr>
<td>72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50 %RH</td>
<td>Total</td>
<td>4.90 (16,700)</td>
<td>6.40 (21,900)</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>4.70 (16,000)</td>
<td>6.20 (21,100)</td>
</tr>
<tr>
<td><strong>Fan Data - Evaporator</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFM (CMH) - High Speed</td>
<td>870 (1478)</td>
<td>1230 (2090)</td>
<td>1320 (2243)</td>
</tr>
<tr>
<td>CFM (CMH) - Low Speed</td>
<td>750 (1274)</td>
<td>1050 (1784)</td>
<td>1175 (1996)</td>
</tr>
<tr>
<td>Fan Motor hp (W)</td>
<td>0.16 (120)</td>
<td>0.20 (150)*</td>
<td>0.27 (200)**</td>
</tr>
<tr>
<td><strong>Evaporator Coil - Copper Tube/Aluminum Fin</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face Area ft² (m²)</td>
<td>2.44 (0.23)</td>
<td>3.92 (0.36)</td>
<td>3.92 (0.36)</td>
</tr>
<tr>
<td>Coil Rows</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Max Face Velocity-fpm (m/s)</td>
<td>356 (1.8)</td>
<td>313 (1.6)</td>
<td>336 (1.7)</td>
</tr>
<tr>
<td>Unit Refrigerant Charge, oz. (kg)</td>
<td>4 (0.11)</td>
<td>5 (0.14)</td>
<td>6.5 (0.18)</td>
</tr>
<tr>
<td>Unit Operating Weight, lb. (kg)</td>
<td>230 (104)</td>
<td>330 (150)</td>
<td>365 (165)</td>
</tr>
<tr>
<td><strong>Electric Reheat Capacities (Includes Fan Motor)-kW (Btuh)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Voltage 230-1-60</td>
<td>2.7 (9215)</td>
<td>5.3 (18,080)</td>
<td>5.5 (18,765)</td>
</tr>
<tr>
<td><strong>Humidifier Data - Steam Generator Type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam capacity - lb/hr (kg/hr)</td>
<td>3 (1.4)</td>
<td>3 (1.4)</td>
<td>3 (1.4)</td>
</tr>
<tr>
<td>Electrical Input Power - kW</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Evaporator Connection Sizes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid line Diameter, O.D. Cu</td>
<td>3/8&quot;</td>
<td>3/8&quot;</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>Suction line Diameter, O.D. Cu</td>
<td>5/8&quot;</td>
<td>7/8&quot;</td>
<td>7/8&quot;</td>
</tr>
<tr>
<td>Humidifier Supply, OD Cu Compression Fitting</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Humidifier Drain, Barb Fitting</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Evaporator Drain, Barb Fitting</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>Filter</td>
<td>Washable Polypropylene/Aluminum, MERV4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.1  Air-cooled Data, 60-Hz (continued)

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>DME020E</th>
<th>DME027E</th>
<th>DME037E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensing Unit Type</td>
<td>PFH - Outdoor</td>
<td>PFH - Outdoor</td>
<td>MCD - Indoor</td>
</tr>
<tr>
<td>Condensing Unit Model Number</td>
<td>PFH020A-LN</td>
<td>PFH027A-LN</td>
<td>MCD24AL_HN</td>
</tr>
<tr>
<td>Condensing Unit Rating Conditions</td>
<td>95°F (35°C) Ambient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coil Face Area ft² (m²)</td>
<td>4.1 (0.38)</td>
<td>4.1 (0.38)</td>
<td>4.6 (0.43)</td>
</tr>
<tr>
<td>Rows of Coil</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>CFM (CMH)</td>
<td>2200 (3738)</td>
<td>2200 (3738)</td>
<td>1000 (1699)</td>
</tr>
<tr>
<td>Motor, hp (W)</td>
<td>0.20 (149)</td>
<td>0.20 (149)</td>
<td>0.33 (246)</td>
</tr>
<tr>
<td>External Static Pressure, in wg. (mm)</td>
<td>N/A</td>
<td>N/A</td>
<td>0.50 (13)</td>
</tr>
<tr>
<td>Condensing Unit Refrigerant Charge, oz. (kg)</td>
<td>134 (3.8)</td>
<td>134 (3.8)</td>
<td>134 (3.8)</td>
</tr>
<tr>
<td>Unit Operating Weight, lb. (kg)</td>
<td>200 (91)</td>
<td>200 (91)</td>
<td>449 (204)</td>
</tr>
<tr>
<td>Refrigerant Connection Sizes, O.D. Cu</td>
<td>Suction</td>
<td>5/8”</td>
<td>5/8”</td>
</tr>
<tr>
<td></td>
<td>Liquid</td>
<td>3/8”</td>
<td>3/8”</td>
</tr>
</tbody>
</table>

The net capacity data has fan motor heat factored in for all ratings and the entering air conditions of 75°F (23.9 °C), 45%RH, is the standard rating condition for ASHRAE 127-2007. All capacities are nominal values; actual performance will be ± 5%.

*DME027 has two motors - 0.08 & 0.12 HP

**DME037 has two motors - 0.11 & 0.16 HP

Table 4.2  Air-cooled Data, 50-Hz

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>DME037E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensing Unit Type</td>
<td>PFH - Outdoor</td>
</tr>
<tr>
<td>DX Evaporator - Net Capacity Data - kW (Btuh) @ High Speed CFM</td>
<td></td>
</tr>
<tr>
<td>80°F DB, 62.8°F WB (26.7°C DB, 17.1°C WB) 38 %RH</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
</tr>
<tr>
<td>75°F DB, 61°F WB (23.9°C DB, 16.1°C WB) 45 %RH</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
</tr>
<tr>
<td>72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50 %RH</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
</tr>
</tbody>
</table>
Table 4.2 Air-cooled Data, 50-Hz (continued)

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>DME037E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensing Unit Type</td>
<td>PFH - Outdoor</td>
</tr>
<tr>
<td>Evaporator Fan Data - Evaporator</td>
<td></td>
</tr>
<tr>
<td>CFM (CMH) - High Speed</td>
<td>1100 (1869)</td>
</tr>
<tr>
<td>CFM (CMH) - Low Speed</td>
<td>980 (1665)</td>
</tr>
<tr>
<td>Fan Motor HP (W)</td>
<td>0.27 (200)**</td>
</tr>
<tr>
<td>Evaporator Coil - Copper Tube/Aluminum Fin</td>
<td></td>
</tr>
<tr>
<td>Face Area ft² (m²)</td>
<td>3.92 (0.36)</td>
</tr>
<tr>
<td>Coil Rows</td>
<td>4</td>
</tr>
<tr>
<td>Max Face Velocity-fpm (m/s)</td>
<td>336 (1.7)</td>
</tr>
<tr>
<td>Unit Refrigerant Charge, oz. (kg)</td>
<td>6.5 (0.18)</td>
</tr>
<tr>
<td>Unit Operating Weight, lb. (kg)</td>
<td>365 (165)</td>
</tr>
<tr>
<td>Electric Reheat Capacities (Includes Fan Motor) - kW (Btuh)</td>
<td></td>
</tr>
<tr>
<td>Input Voltage 230-1-50</td>
<td>5.5 (18,765)</td>
</tr>
<tr>
<td>Humidifier Data - Steam Generator Type</td>
<td></td>
</tr>
<tr>
<td>Steam capacity - lb/hr (kg/hr)</td>
<td>3 (14)</td>
</tr>
<tr>
<td>Electrical Input Power - kW</td>
<td>1</td>
</tr>
<tr>
<td>Evaporator Connection Sizes</td>
<td></td>
</tr>
<tr>
<td>Liquid line Diameter, O.D. Cu</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>Suction Line Diameter, O.D. Cu</td>
<td>7/8&quot;</td>
</tr>
<tr>
<td>Humidifier Supply, OD Cu Compression Fitting</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Humidifier Drain, Barb Fitting</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Evaporator Drain, Barb Fitting</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>Filter</td>
<td>Washable Polypropylene/Aluminum, MERV4</td>
</tr>
</tbody>
</table>
### Table 4.2  Air-cooled Data, 50-Hz (continued)

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>DME037E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensing Unit Type</td>
<td>PFH - Outdoor</td>
</tr>
<tr>
<td>Condensing Unit Model Number</td>
<td>PFH036A- _LN</td>
</tr>
<tr>
<td>Condensing Unit Rating Conditions</td>
<td></td>
</tr>
<tr>
<td>Coil Face Area ft² (m²)</td>
<td>7.7 (0.72)</td>
</tr>
<tr>
<td>Rows of Coil</td>
<td>2</td>
</tr>
<tr>
<td>CFM (CMH)</td>
<td>2500 (4248)</td>
</tr>
<tr>
<td>Motor, hp (W)</td>
<td>0.20 (149)</td>
</tr>
<tr>
<td>External Static Pressure, in wg. (mm)</td>
<td>N/A</td>
</tr>
<tr>
<td>Condensing Unit Refrigerant Charge, oz. (kg)</td>
<td>213 (6.0)</td>
</tr>
<tr>
<td>Unit Operating Weight, lb. (kg)</td>
<td>241 (109)</td>
</tr>
<tr>
<td>Refrigerant Connection Sizes, O.D. Cu</td>
<td></td>
</tr>
<tr>
<td>Suction</td>
<td>3/4”</td>
</tr>
<tr>
<td>Liquid</td>
<td>3/8”</td>
</tr>
</tbody>
</table>

The net capacity data has fan motor heat factored in for all ratings and the entering air conditions of 75°F (23.9 °C), 45%RH, is the standard rating condition for ASHRAE 127-2007. All capacities are nominal values; actual performance will be ± 5%.

**DME037 has two motors - 0.11 & 0.16 HP**
### 4.2 Water/Glycol-cooled Systems—Capacity and Performance Data

**Table 4.3** Water-cooled and Glycol-cooled Units, 60-Hz

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>DME020E</th>
<th>DME027E</th>
<th>DME037E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensing Unit Type</td>
<td>Water-Cooled</td>
<td>Glycol-Cooled</td>
<td>Water-Cooled</td>
</tr>
<tr>
<td>DX Evaporator - Net Capacity Data - kW (Btuh) @ High Speed CFM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80°F DB, 62.8°F WB (26.7°C DB, 17.1°C WB) 38 %RH</td>
<td>Total</td>
<td>5.90 (20,100)</td>
<td>5.15 (17,600)</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>5.80 (19,800)</td>
<td>5.15 (17,600)</td>
</tr>
<tr>
<td>75°F DB, 61°F WB (23.9°C DB, 16.1°C WB) 45 %RH</td>
<td>Total</td>
<td>5.50 (18,800)</td>
<td>4.80 (16,300)</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>5.15 (17,600)</td>
<td>4.75 (16,200)</td>
</tr>
<tr>
<td>72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50 %RH</td>
<td>Total</td>
<td>5.35 (18,100)</td>
<td>4.60 (15,700)</td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>4.75 (16,200)</td>
<td>4.35 (14,900)</td>
</tr>
</tbody>
</table>

**Fan Data - Evaporator**

| CFM (CMH) - High Speed | 870 (1478) | 1230 (2090) | 1320 (2243) |
| CFM (CMH) - Low Speed | 750 (1274) | 1050 (1784) | 1175 (1996) |
| Fan Motor hp (W) | 0.16 (120) | 0.20 (150) | 0.27 (200)** |

**Evaporator Coil - Copper Tube/Aluminum Fin**

| Face Area ft² (m²) | 2.44 (0.23) | 2.44 (0.23) | 3.92 (0.36) | 3.92 (0.36) |
| Coil Rows | 4 | 3 | 4 |
| Max Face Velocity-fpm (m/s) | 356 (1.8) | 313 (1.6) | 336 (1.7) |
| Unit Refrigerant Charge, oz. (kg) | 4 (0.11) | 5 (0.14) | 6.5 (0.18) |
| Unit Operating Weight, lb. (kg) | 230 (104) | 330 (150) | 365 (165) |

**Electric Reheat Capacities (Includes Fan Motor) - kW (Btuh)**

| Input Voltage 230-1-60 | 2.7 (9215) | 5.3 (18,080) | 5.5 (18,765) |

**Humidifier Data - Steam Generator Type**

| Steam capacity - lb/hr (kg/hr) | 3 (1.4) | 3 (1.4) | 3 (1.4) |
| Electrical Input Power - kW | 1 | 1 | 1 |

**Evaporator Connection Sizes**

| Liquid line Diameter, O.D. Cu | 3/8” | 3/8” | 3/8” |
| Suction line Diameter, O.D. Cu | 5/8” | 7/8” | 7/8” |
| Humidifier Supply | 1/4” OD Copper Compression Fitting |
| Humidifier Drain, Barb Fitting | 1/2” | 1/2” | 1/2” |
| Evaporator Drain, Barb Fitting | 3/4” | 3/4” | 3/4” |
### Table 4.3 Water-cooled and Glycol-cooled Units, 60-Hz (continued)

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>DME020E</th>
<th>DME027E</th>
<th>DME037E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensing Unit Type</td>
<td>Water-Cooled</td>
<td>Glycol-Cooled</td>
<td>Water-Cooled</td>
</tr>
<tr>
<td>Filter</td>
<td>Washable Polypropylene/Aluminum, MERV 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close-Coupled DMC Condensing Unit Model</td>
<td>DMC022WG</td>
<td>DMC029WG</td>
<td>DMC040WG</td>
</tr>
<tr>
<td>Condenser Fluid Requirements, °F (°C)</td>
<td>85 (29.4) EWT</td>
<td>110 (43.3) EGT - 40% PG</td>
<td>85 (29.4) EWT</td>
</tr>
<tr>
<td>THR - kW (Btu/h) @ 75°F/45%RH</td>
<td>7.30 (24,900)</td>
<td>7.10 (24,200)</td>
<td>9.60 (32,700)</td>
</tr>
<tr>
<td>Flow Rate - GPM (l/m)</td>
<td>4.0 (15.2)</td>
<td>5.9 (22.4)</td>
<td>4.6 (17.4)</td>
</tr>
<tr>
<td>Pressure Drop - ft. of H2O (kPa)</td>
<td>7.0 (20.9)</td>
<td>17.0 (50.8)</td>
<td>4.4 (13.2)</td>
</tr>
<tr>
<td>Water-Cooled Condensing Temperature, °F (°C)</td>
<td>105 (40.6)</td>
<td>N/A</td>
<td>105 (40.6)</td>
</tr>
<tr>
<td>Water/Glycol Connection Sizes, in. (mm) OD</td>
<td>5/8 (15.9)</td>
<td>7/8 (22.2)</td>
<td></td>
</tr>
<tr>
<td>Liquid line Diameter, O.D. Cu</td>
<td>3/8*</td>
<td>3/8*</td>
<td>3/8*</td>
</tr>
<tr>
<td>Suction Line Diameter, O.D. Cu</td>
<td>5/8*</td>
<td>5/8*</td>
<td>3/4*</td>
</tr>
<tr>
<td>Unit Volume - Gal (l)</td>
<td>0.25 (0.95)</td>
<td>0.40 (1.5)</td>
<td>0.50 (1.9)</td>
</tr>
<tr>
<td>Unit Refrigerant Charge, oz. (kg)</td>
<td>47 (133)</td>
<td>59 (1.67)</td>
<td>61 (1.72)</td>
</tr>
<tr>
<td>Unit Operating Weight, lb. (kg)</td>
<td>169 (77)</td>
<td>169 (77)</td>
<td>172 (78)</td>
</tr>
<tr>
<td>Remote MCD Condensing Unit Model #</td>
<td>—</td>
<td>—</td>
<td>MCD26W</td>
</tr>
<tr>
<td>Condenser Fluid Requirements, °F (°C)</td>
<td>N/A</td>
<td>85 (29.4) EWT</td>
<td>110 (43.3) EGT - 40% PG</td>
</tr>
<tr>
<td>THR - kW (Btu/h) @ 75°F/45%RH</td>
<td>—</td>
<td>—</td>
<td>9.60 (32,700)</td>
</tr>
<tr>
<td>Flow Rate - GPM (l/m)</td>
<td>—</td>
<td>—</td>
<td>7.7 (24.2)</td>
</tr>
<tr>
<td>Pressure Drop - ft. of H2O (kPa)</td>
<td>—</td>
<td>—</td>
<td>16.6 (49.6)</td>
</tr>
<tr>
<td>Water-Cooled Condensing Temperature</td>
<td>—</td>
<td>—</td>
<td>105°F (40.6°C)</td>
</tr>
<tr>
<td>Water/Glycol Connection Sizes, in. (mm) OD</td>
<td>—</td>
<td>—</td>
<td>7/8 (22.2)</td>
</tr>
<tr>
<td>Unit Volume - Gal (l)</td>
<td>—</td>
<td>—</td>
<td>12 (4.5)</td>
</tr>
<tr>
<td>Unit Refrigerant Charge, oz. (kg)</td>
<td>—</td>
<td>—</td>
<td>41 (1.16)</td>
</tr>
<tr>
<td>Unit Operating Weight, lb. (kg)</td>
<td>—</td>
<td>—</td>
<td>175 (79)</td>
</tr>
<tr>
<td>Refrigerant Connection Sizes, O.D. Cu</td>
<td>Suction</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Liquid</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

The net capacity data has fan motor heat factored in for all ratings and the entering air conditions of 75°F (23.9°C), 45%RH, is the standard rating condition for ASHRAE 127-2007. All capacities are nominal values; actual performance will be ±5%.

*DME027 has two motors - 0.08 & 0.12 HP; ** DME037 has two motors - 0.11 & 0.16 HP.
Table 4.4  Water-cooled and Glycol-cooled Units, 50-Hz

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>Condensing Unit Type</th>
<th>DME037E</th>
<th>Water-Cooled</th>
<th>Glycol-Cooled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DX Evaporator-Net Capacity Data - kW (Btuh) @ High Speed CFM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80°F DB, 62.8°F WB (26.7°C DB, 17.1°C WB) 38 %RH</td>
<td>Total</td>
<td>11.3 (38,700)</td>
<td>9.30 (31,800)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>9.55 (32,600)</td>
<td>8.60 (29,300)</td>
<td></td>
</tr>
<tr>
<td>75°F DB, 61°F WB (23.9°C DB, 16.1°C WB) 45 %RH</td>
<td>Total</td>
<td>11.0 (37,400)</td>
<td>8.95 (30,500)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>8.55 (29,200)</td>
<td>7.60 (26,000)</td>
<td></td>
</tr>
<tr>
<td>72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50 %RH</td>
<td>Total</td>
<td>10.7 (36,600)</td>
<td>8.75 (29,900)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sensible</td>
<td>7.95 (27,200)</td>
<td>7.05 (24,000)</td>
<td></td>
</tr>
<tr>
<td>Fan Data - Evaporator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CFM (CMH) - High Speed</td>
<td>1100 (1869)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CFM (CMH) - Low Speed</td>
<td>980 (1665)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fan Motor HP (W)</td>
<td>0.27 (200)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaporator Coil - Copper Tube/Aluminum Fin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Face Area ft² (m²)</td>
<td>3.92 (0.36)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max Face Velocity-fpm (m/s)</td>
<td>336 (1.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit Refrigerant Charge, oz. (kg)</td>
<td>6.5 (0.18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit Operating Weight, lb. (kg)</td>
<td>365 (165)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Reheat Capacities (Includes Fan Motor)-kW (Btu/H)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Input Voltage 230-1-50</td>
<td>5.5 (18,765)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidifier Data - Steam Generator Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Steam capacity - lb/hr (kg/hr)</td>
<td>3 (1.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrical Input Power - kW</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaporator Connection Sizes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Liquid line Diameter, O.D. Cu</td>
<td>3/8&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suction Line Diameter, O.D. Cu</td>
<td>7/8&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humidifier Supply</td>
<td>1/4&quot; OD Cu Compression Fitting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evaporator Drain, Barb Fitting</td>
<td>1/2&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evaporator Drain, Barb Fitting</td>
<td>3/4&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Filter</td>
<td>Washable Polypropylene/Aluminum, MERV4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote MCD Condensing Unit Model #</td>
<td></td>
<td></td>
<td></td>
<td>MCD37W</td>
</tr>
<tr>
<td>Condenser Fluid Requirements</td>
<td></td>
<td></td>
<td></td>
<td>85°F (29.4°C) EWT</td>
</tr>
</tbody>
</table>
Table 4.4 Water-cooled and Glycol-cooled Units, 50-Hz (continued)

<table>
<thead>
<tr>
<th>Evaporator Model</th>
<th>DME037E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensing Unit Type</td>
<td>Water-Cooled</td>
</tr>
<tr>
<td>THR - kW (Btuh) @ 75°F/45%RH</td>
<td>13.7 (46,700)</td>
</tr>
<tr>
<td>Flow Rate - GPM (l/m)</td>
<td>6.4 (24.3)</td>
</tr>
<tr>
<td>Pressure Drop - ft. of H2O (kPa)</td>
<td>11.7 (35.0)</td>
</tr>
<tr>
<td>Water-Cooled Condensing Temperature</td>
<td>105 °F (40.6 °C)</td>
</tr>
<tr>
<td>Water/Glycol Connection Sizes, in. (mm) OD</td>
<td>7/8 (22.2)</td>
</tr>
<tr>
<td>Unit Volume - Gal(l)</td>
<td>1.2 (4.5)</td>
</tr>
<tr>
<td>Unit Refrigerant Charge, oz. (kg)</td>
<td>54 (1.54)</td>
</tr>
<tr>
<td>Unit Operating Weight, lb. (kg)</td>
<td>220 (100)</td>
</tr>
<tr>
<td>Refrigerant Connection Sizes, O.D. Cu</td>
<td>Suction 7/8&quot;</td>
</tr>
<tr>
<td></td>
<td>Liquid 3/8&quot;</td>
</tr>
</tbody>
</table>

The net capacity data has fan motor heat factored in for all ratings and the entering air conditions of 75°F (23.9 °C), 45%RH, is the standard rating condition for ASHRAE 127-2007. All capacities are nominal values; actual performance will be ± 5%.

**DME037 has two motors - 0.11 & 0.16 hp**
# 4.3 Chilled-water Systems—Capacity and Performance Data

## Table 4.5  Chilled water data, 50/60Hz

<table>
<thead>
<tr>
<th>Model Number</th>
<th>208/230-1-60</th>
<th>200/220-1-50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net Capacity Data - kW (Btuh) based on 45°F (7.2°C) EWT &amp; 10°F (5.6°C) temperature rise</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80°F DB, 62.8°F WB (26.7°C DB, 17.1°C WB) 38%RH</td>
<td>10.5 (35,800)</td>
<td>9.05 (30,900)</td>
</tr>
<tr>
<td></td>
<td>9.65 (33,000)</td>
<td>8.25 (28,200)</td>
</tr>
<tr>
<td>Flow Rate, GPM (l/m)</td>
<td>7.3 (27.7)</td>
<td>6.3 (23.9)</td>
</tr>
<tr>
<td>Pressure Drop, ft. water (kPa)</td>
<td>12.5 (37.4)</td>
<td>9.7 (29.0)</td>
</tr>
<tr>
<td>75°F DB, 61°F WB (23.9°C DB, 16.1°C WB) 45%RH</td>
<td>8.75 (29,800)</td>
<td>7.55 (25,800)</td>
</tr>
<tr>
<td></td>
<td>7.95 (27,100)</td>
<td>6.85 (23,300)</td>
</tr>
<tr>
<td>Flow Rate, GPM (l/m)</td>
<td>6.1 (23.1)</td>
<td>5.3 (20.1)</td>
</tr>
<tr>
<td>Pressure Drop, ft. water (kPa)</td>
<td>9.1 (27.2)</td>
<td>7.0 (20.9)</td>
</tr>
<tr>
<td>72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50%RH</td>
<td>7.65 (26,100)</td>
<td>6.6 (22,600)</td>
</tr>
<tr>
<td></td>
<td>6.90 (23,500)</td>
<td>5.9 (20,200)</td>
</tr>
<tr>
<td>Flow Rate, GPM (l/m)</td>
<td>5.3 (20.1)</td>
<td>4.6 (17.4)</td>
</tr>
<tr>
<td>Pressure Drop, ft. water (kPa)</td>
<td>7.2 (21.5)</td>
<td>5.6 (16.7)</td>
</tr>
</tbody>
</table>

## Fan Data - Evaporator

<table>
<thead>
<tr>
<th></th>
<th>208/230-1-60</th>
<th>200/220-1-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM (CMH) - High Speed</td>
<td>1320 (2243)</td>
<td>1100 (1869)</td>
</tr>
<tr>
<td>CFM (CMH) - Low Speed</td>
<td>1175 (1996)</td>
<td>980 (1665)</td>
</tr>
<tr>
<td>Fan Motor, hp (W)</td>
<td>0.27 (200)**</td>
<td>0.27 (200)**</td>
</tr>
</tbody>
</table>

## CW Coil - Copper Tube/Aluminum Fin

<table>
<thead>
<tr>
<th></th>
<th>208/230-1-60</th>
<th>200/220-1-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face Area, ft² (m²)</td>
<td>3.92 (0.36)</td>
<td></td>
</tr>
<tr>
<td>Coil Rows</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Max Face Velocity-fpm (m/s)</td>
<td>336 (1.7)</td>
<td>281 (1.4)</td>
</tr>
</tbody>
</table>

## Electric Reheat Capacity (Includes Fan Motor), kW (Btuh)

| Input Voltage 230-1-60/50 | 5.5 (18,765) |

## Humidifier Data - Steam Generator Type

<table>
<thead>
<tr>
<th></th>
<th>208/230-1-60</th>
<th>200/220-1-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam capacity, lb/hr (kg/hr)</td>
<td>3 (1.4)</td>
<td></td>
</tr>
<tr>
<td>Electrical Input Power, kW</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

## Unit Connection Sizes

<table>
<thead>
<tr>
<th></th>
<th>208/230-1-60</th>
<th>200/220-1-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>CW supply and return connections, in (mm) OD</td>
<td>7/8 (22.2)</td>
<td></td>
</tr>
<tr>
<td>Humidifier Supply</td>
<td>1/4* OD Copper Compression Fitting</td>
<td></td>
</tr>
<tr>
<td>Humidifier Drain, Barb Fitting</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>Evaporator/Condensate Drain, Barb Fitting</td>
<td>3/4*</td>
<td></td>
</tr>
<tr>
<td>Unit Internal Fluid Volume, gal (l)</td>
<td>1.0 (3.8)</td>
<td></td>
</tr>
<tr>
<td>Filter</td>
<td>Washable Polypropylene/Aluminum, MERV4</td>
<td></td>
</tr>
</tbody>
</table>
### Table 4.5  Chilled water data, 50/60Hz (continued)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>DME044C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>208/230-1-60</td>
</tr>
<tr>
<td>Unit Operating Weight, lb. (kg.)</td>
<td>365 (165)</td>
</tr>
<tr>
<td>Unit Valve Types</td>
<td>On/Off Slow Close, 2-Way</td>
</tr>
<tr>
<td>Valve Size</td>
<td>3/4”</td>
</tr>
<tr>
<td>Valve Cv</td>
<td>7</td>
</tr>
<tr>
<td>Max. Water Static Operating Pressure, psi (kPa)</td>
<td>300 (2068)</td>
</tr>
<tr>
<td>Close-Off Pressure, psi (kPa)</td>
<td>60 (414)</td>
</tr>
</tbody>
</table>

The net capacity data has fan motor heat factored in for all ratings and the entering air conditions of 75°F (23.9 °C), 45%RH, is the standard rating condition for ASHRAE 127-2007. All capacities are nominal values; actual performance will be ± 5%.

** DME044C has two motors - 0.11 & 0.16 HP

### Table 4.6  Chilled water capacity correction factors based on 10°F (5.6°C) water rise

<table>
<thead>
<tr>
<th>EWT</th>
<th>72°F (22.2°C) 50%</th>
<th>75°F (23.9°C) 45%RH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TCC</td>
<td>SCC</td>
</tr>
<tr>
<td>42°F (5.6°C)</td>
<td>1.27</td>
<td>1.14</td>
</tr>
<tr>
<td>43°F (6.1°C)</td>
<td>1.17</td>
<td>1.09</td>
</tr>
<tr>
<td>44°F (6.7°C)</td>
<td>1.08</td>
<td>1.04</td>
</tr>
<tr>
<td>45°F (7.2°C)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>46°F (7.8°C)</td>
<td>0.93</td>
<td>0.96</td>
</tr>
<tr>
<td>47°F (8.3°C)</td>
<td>0.86</td>
<td>0.92</td>
</tr>
<tr>
<td>48°F (8.9°C)</td>
<td>0.79</td>
<td>0.88</td>
</tr>
<tr>
<td>49°F (9.4°C)</td>
<td>0.74</td>
<td>0.83</td>
</tr>
</tbody>
</table>
4.4 Planning Dimensions

The unit dimensions are described in the submittal documents included in the Submittal Drawings on page 41.

The following table lists the relevant documents by number and title.

Table 4.7 Dimension Planning Drawings

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPN000262</td>
<td>Cabinet Dimensions, Evaporator/Chilled-water Unit</td>
</tr>
<tr>
<td>DPN000269</td>
<td>Cabinet Dimensions, Evaporator/Chilled-water Unit</td>
</tr>
<tr>
<td>DPN004418</td>
<td>Cabinet Dimensions, Prop-fan Condensing Unit with horizontal air discharge</td>
</tr>
<tr>
<td>DPN003094</td>
<td>Optional Anchorage Plan, Prop-fan Condensing Unit with horizontal air discharge</td>
</tr>
<tr>
<td>DPN004420</td>
<td>Cabinet Dimensions, Air-cooled units</td>
</tr>
<tr>
<td>DPN004421</td>
<td>Cabinet Dimensions, Water/Glycol-cooled units</td>
</tr>
</tbody>
</table>
5 ELECTRICAL DATA

5.1 Evaporators and Chilled-water Units Electrical Data

Table 5.1 Split-system Evaporator or Self-contained Chilled-water units, 50/60-Hz

<table>
<thead>
<tr>
<th>Base Evaporator/Chilled Water</th>
<th>208/230V-1ph-60Hz</th>
<th>200/220V-1-50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DME020E</td>
<td>DME027E</td>
</tr>
<tr>
<td>Cooling Only</td>
<td>DME020E</td>
<td>DME027E</td>
</tr>
<tr>
<td>FLA</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>WSA</td>
<td>1.8</td>
<td>1.9</td>
</tr>
<tr>
<td>OPD</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>With Reheat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLA</td>
<td>11.8</td>
<td>22.3</td>
</tr>
<tr>
<td>WSA</td>
<td>14.8</td>
<td>27.9</td>
</tr>
<tr>
<td>OPD</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>With Reheat &amp; Humidifier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLA</td>
<td>18.8</td>
<td>29.3</td>
</tr>
<tr>
<td>WSA</td>
<td>23.5</td>
<td>36.6</td>
</tr>
<tr>
<td>OPD</td>
<td>25</td>
<td>40</td>
</tr>
</tbody>
</table>

5.2 Close-coupled Water/Glycol Units Electrical Data

Table 5.2 Evaporator with Close-coupled Water/Glycol Condensing Unit with common power feed, 60-Hz

<table>
<thead>
<tr>
<th>Nominal Capacity, Tons</th>
<th>1.5</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaporator Model</td>
<td>DME020E</td>
<td>DME027E</td>
<td>DME037E</td>
</tr>
<tr>
<td>Condensing Model</td>
<td>DMC022WG</td>
<td>DMC029WG</td>
<td>DMC040WG</td>
</tr>
<tr>
<td>Volt-Ph-Hz</td>
<td>208/230-1-60</td>
<td>208/230-1-60</td>
<td>208/230-1-60</td>
</tr>
<tr>
<td>Cooling Only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLA</td>
<td>12.1</td>
<td>13.5</td>
<td>19.3</td>
</tr>
<tr>
<td>WSA</td>
<td>14.8</td>
<td>16.5</td>
<td>23.6</td>
</tr>
<tr>
<td>OPD</td>
<td>25</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>With Reheat or With Reheat &amp; Humidifier</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLA</td>
<td>22.5</td>
<td>34.3</td>
<td>40.1</td>
</tr>
<tr>
<td>WSA</td>
<td>27.8</td>
<td>42.5</td>
<td>49.6</td>
</tr>
<tr>
<td>OPD</td>
<td>35</td>
<td>45</td>
<td>60</td>
</tr>
</tbody>
</table>
### 5.3 Indoor, Remote Condensing Units Electrical Data

Table 5.3 Indoor, Remote Air- and Water/Glycol Condensing Unit Electrical Data, 60-Hz and 50Hz

<table>
<thead>
<tr>
<th>Model</th>
<th>FLA</th>
<th>WSA</th>
<th>OPD</th>
<th>FLA</th>
<th>WSA</th>
<th>OPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD24A</td>
<td>14.3</td>
<td>17.3</td>
<td>25</td>
<td>MCD24A</td>
<td>12.7</td>
<td>15.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>FLA</th>
<th>WSA</th>
<th>OPD</th>
<th>FLA</th>
<th>WSA</th>
<th>OPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD36A</td>
<td>20.8</td>
<td>25.1</td>
<td>40</td>
<td>MCD36A</td>
<td>16.6</td>
<td>20.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>FLA</th>
<th>WSA</th>
<th>OPD</th>
<th>FLA</th>
<th>WSA</th>
<th>OPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD26W</td>
<td>12.0</td>
<td>15.0</td>
<td>25</td>
<td>MCD26W</td>
<td>10.4</td>
<td>13.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>FLA</th>
<th>WSA</th>
<th>OPD</th>
<th>FLA</th>
<th>WSA</th>
<th>OPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD38W</td>
<td>17.1</td>
<td>21.4</td>
<td>35</td>
<td>MCD38W</td>
<td>14.3</td>
<td>17.9</td>
</tr>
</tbody>
</table>

### 5.4 Outdoor Condensing Units Electrical Data

Table 5.4 Outdoor Condensing Unit Electrical Data, 60-Hz

<table>
<thead>
<tr>
<th>Nom. Capacity, Tons</th>
<th>1.5</th>
<th>2</th>
<th>3</th>
<th>3</th>
<th>3</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 95°F (35°C) Propeller Fan Condensing Unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>PFH020A-PLN</th>
<th>PFH027A-PLN</th>
<th>PFH037A-PLN</th>
<th>PFH037A-YLN</th>
<th>PFH037A-ALN</th>
<th>PFH037A-BLN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volt-Ph-Hz</td>
<td>208/230-1-60</td>
<td>208/230-1-60</td>
<td>208/230-1-60</td>
<td>208/230-3-60</td>
<td>460-3-60</td>
<td>575-3-60</td>
</tr>
<tr>
<td>FLA</td>
<td>12.1</td>
<td>13.4</td>
<td>18.5</td>
<td>13.4</td>
<td>7.1</td>
<td>5.8</td>
</tr>
<tr>
<td>WSA</td>
<td>14.8</td>
<td>16.4</td>
<td>22.8</td>
<td>16.4</td>
<td>8.7</td>
<td>7.0</td>
</tr>
<tr>
<td>OPD</td>
<td>25</td>
<td>25</td>
<td>35</td>
<td>25</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>
### Table 5.4  Outdoor Condensing Unit Electrical Data, 60-Hz (continued)

<table>
<thead>
<tr>
<th>Model</th>
<th>N/A</th>
<th>PFH027A-PHN</th>
<th>PFH037A-PHN</th>
<th>PFH037A-YHN</th>
<th>PFH037A-AHN</th>
<th>PFH037A-BHN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volt-Ph-Hz</td>
<td>N/A</td>
<td>208/230-1-60</td>
<td>208/230-1-60</td>
<td>208/230-3-60</td>
<td>460-3-60</td>
<td>575-3-60</td>
</tr>
<tr>
<td>FLA</td>
<td>N/A</td>
<td>15.4</td>
<td>20.5</td>
<td>15.4</td>
<td>8.1</td>
<td>5.8</td>
</tr>
<tr>
<td>WSA</td>
<td>N/A</td>
<td>18.4</td>
<td>24.8</td>
<td>18.4</td>
<td>9.7</td>
<td>7.0</td>
</tr>
<tr>
<td>OPD</td>
<td>N/A</td>
<td>30</td>
<td>40</td>
<td>30</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

### Quiet-Line Propeller Fan Condensing Unit

<table>
<thead>
<tr>
<th>Model</th>
<th>N/A</th>
<th>PFHZ27A-PLN</th>
<th>PFHZ37A-PLN</th>
<th>PFHZ37A-YLN</th>
<th>PFHZ37A-ALN</th>
<th>—</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volt-Ph-Hz</td>
<td>N/A</td>
<td>208/230-1-60</td>
<td>208/230-1-60</td>
<td>208/230-3-60</td>
<td>460-3-60</td>
<td>—</td>
</tr>
<tr>
<td>FLA</td>
<td>N/A</td>
<td>12.9</td>
<td>18.0</td>
<td>12.9</td>
<td>7.1</td>
<td>—</td>
</tr>
<tr>
<td>WSA</td>
<td>N/A</td>
<td>15.9</td>
<td>22.3</td>
<td>15.9</td>
<td>8.7</td>
<td>—</td>
</tr>
<tr>
<td>OPD</td>
<td>N/A</td>
<td>25</td>
<td>40</td>
<td>30</td>
<td>15</td>
<td>—</td>
</tr>
</tbody>
</table>

### Table 5.5  Outdoor Condensing Unit Electrical Data, 50-Hz

<table>
<thead>
<tr>
<th>Nominal Capacity, Tons</th>
<th>3</th>
<th>3</th>
</tr>
</thead>
</table>

#### Standard 96°F (35°C) Propeller Fan Condensing Unit

<table>
<thead>
<tr>
<th>Model</th>
<th>PFH036A-SLN</th>
<th>PFH036A-MLN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volt-Ph-Hz</td>
<td>220-1-50</td>
<td>380/415-3-50</td>
</tr>
<tr>
<td>FLA</td>
<td>18.4</td>
<td>7.0</td>
</tr>
</tbody>
</table>

#### High Ambient Propeller Fan Condensing Unit

<table>
<thead>
<tr>
<th>Model</th>
<th>PFH036A-SHN</th>
<th>PFH036A-MHN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volt-Ph-Hz</td>
<td>220-1-50</td>
<td>380/415-3-50</td>
</tr>
<tr>
<td>FLA</td>
<td>20.5</td>
<td>8.1</td>
</tr>
</tbody>
</table>

#### Quiet-Line Propeller Fan Condensing Unit

<table>
<thead>
<tr>
<th>Model</th>
<th>PFHZ36A-SLN</th>
<th>PFHZ36A-MLN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volt-Ph-Hz</td>
<td>220-1-50</td>
<td>380/415-3-50</td>
</tr>
<tr>
<td>FLA</td>
<td>18.0</td>
<td>6.9</td>
</tr>
</tbody>
</table>
5.5 Electrical Field Connections

Electrical service must conform to national and local electrical codes. The electrical connections are described in the submittal documents included in the Submittal Drawings on page 41.

The following table lists the relevant documents by number and title.

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPN000264</td>
<td>Electrical Connections, Air-cooled and Chilled-water units</td>
</tr>
<tr>
<td>DPN000271</td>
<td>Electrical Connections, Water/Glycol-cooled units</td>
</tr>
<tr>
<td>DPN003990</td>
<td>Liebert® iCOM™ CMS Electrical and Communication Connections</td>
</tr>
<tr>
<td>DPN000207</td>
<td>Electrical Connections, Air-cooled units</td>
</tr>
<tr>
<td>DPN000209</td>
<td>Electrical Connections, Water/Glycol-cooled units</td>
</tr>
</tbody>
</table>
6 PIPING

The pipe connection locations, piping general arrangement and schematics are described in the submittal documents included in the Submittal Drawings on page 41.

The following tables list the relevant documents by number and title.

Table 6.1 Piping General-arrangement Drawings

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPN004406</td>
<td>Piping, Air-cooled models</td>
</tr>
<tr>
<td>DPN004405</td>
<td>Piping, Split-system Water/Glycol models</td>
</tr>
<tr>
<td>DPN004403</td>
<td>Piping, Close-coupled Water/Glycol and Chilled-water models</td>
</tr>
<tr>
<td>DPN003822</td>
<td>Multiple Drycoolers and Cooling Units on Common Glycol Loop</td>
</tr>
</tbody>
</table>

Table 6.2 Piping Connection Drawings

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaporator and Chilled-water Units</td>
<td>Piping Connections, Chilled-water units</td>
</tr>
<tr>
<td>DPN004306</td>
<td>Piping Connections, Chilled-water units</td>
</tr>
<tr>
<td>Split-system Indoor Condensing Units</td>
<td>Piping Connections, Air-cooled condensing unit</td>
</tr>
<tr>
<td>DPN004420</td>
<td>Piping Connections, Air-cooled condensing unit</td>
</tr>
<tr>
<td>DPN004421</td>
<td>Piping Connections, Remote Water/Glycol-cooled condensing unit</td>
</tr>
<tr>
<td>DPN004309</td>
<td>Piping Connections, Close-coupled Water/Glycol-cooled units</td>
</tr>
<tr>
<td>Condensate-pump Connection</td>
<td>Field-installed pump connection</td>
</tr>
<tr>
<td>DPN004306</td>
<td>Field-installed pump connection</td>
</tr>
</tbody>
</table>

6.1 Refrigerant Charge Requirements

Table 6.3 R-407C refrigerant unit charge

<table>
<thead>
<tr>
<th>60 Hz</th>
<th>50 Hz</th>
<th>Charge R-407C, oz (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DME020E</td>
<td>—</td>
<td>4 (0.11)</td>
</tr>
<tr>
<td>DME027E</td>
<td>—</td>
<td>5 (0.14)</td>
</tr>
<tr>
<td>DME037E</td>
<td>DME037E</td>
<td>6.5 (0.18)</td>
</tr>
<tr>
<td>MCD24AL_HN</td>
<td>—</td>
<td>134 (3.80)</td>
</tr>
<tr>
<td>MCD36AL_HN</td>
<td>MCD35AL_HN</td>
<td>213 (6.04)</td>
</tr>
<tr>
<td>MCD26W_HN</td>
<td>—</td>
<td>47 (1.33)</td>
</tr>
<tr>
<td>MCD38W_HN</td>
<td>MCD37W_HN</td>
<td>54 (1.54)</td>
</tr>
<tr>
<td>DMC022WG</td>
<td>—</td>
<td>59 (1.67)</td>
</tr>
<tr>
<td>DMC029WG</td>
<td>—</td>
<td>61 (1.72)</td>
</tr>
<tr>
<td>DMC040WG</td>
<td>—</td>
<td>134 (3.80)</td>
</tr>
<tr>
<td>PFH020A_LN</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>
Table 6.3  R-407C refrigerant unit charge (continued)

<table>
<thead>
<tr>
<th></th>
<th>60 Hz</th>
<th>50 Hz</th>
<th>Charge R-407C, oz (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFH027A-_LN</td>
<td>—</td>
<td></td>
<td>134 (3.80)</td>
</tr>
<tr>
<td>PFH027A-_HN</td>
<td>—</td>
<td></td>
<td>213 (6.04)</td>
</tr>
<tr>
<td>PFHZ27A-_LN</td>
<td>—</td>
<td></td>
<td>213 (6.04)</td>
</tr>
<tr>
<td>PFH037A-_LN</td>
<td>PFH036A-_LN</td>
<td></td>
<td>213 (6.04)</td>
</tr>
<tr>
<td>PFH037A-_HN</td>
<td>PFH036A-_HN</td>
<td></td>
<td>426 (12.08)</td>
</tr>
<tr>
<td>PFHZ37A-_LN</td>
<td>PFHZ36A-_LN</td>
<td></td>
<td>426 (12.08)</td>
</tr>
</tbody>
</table>

Table 6.4  Line charges of R-407C refrigerant per 100 ft (30 m) of Type-L copper tube

<table>
<thead>
<tr>
<th>Line Size, OD, in.</th>
<th>Liquid Line, lb (kg)</th>
<th>Suction Line, lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>3.6 (1.6)</td>
<td>—</td>
</tr>
<tr>
<td>1/2</td>
<td>6.7 (3.0)</td>
<td>0.2 (0.1)</td>
</tr>
<tr>
<td>5/8</td>
<td>10.8 (4.8)</td>
<td>0.3 (0.1)</td>
</tr>
<tr>
<td>3/4</td>
<td>16.1 (7.2)</td>
<td>0.4 (0.2)</td>
</tr>
<tr>
<td>7/8</td>
<td>22.3 (10.0)</td>
<td>0.5 (0.3)</td>
</tr>
<tr>
<td>1-1/8</td>
<td>38.0 (17.0)</td>
<td>0.9 (0.4)</td>
</tr>
<tr>
<td>1-3/8</td>
<td>57.9 (25.9)</td>
<td>1.4 (0.7)</td>
</tr>
</tbody>
</table>

Source: DPN0003099 Rev. 1

6.1.1 Refrigerant-line Sizes and Equivalent Lengths

The following tables list information required to field-install the refrigerant piping for the system.

The pipe connection sizes for your equipment are included in the appropriate submittal documents included in the Submittal Drawings.

Table 6.5  Recommended refrigerant line sizes, O.D. cu by equivalent length

<table>
<thead>
<tr>
<th>Equivalent Length, ft (m)</th>
<th>1.5-Ton Suction</th>
<th>1.5-Ton Liquid</th>
<th>2-Ton Suction</th>
<th>2-Ton Liquid</th>
<th>3-Ton Suction</th>
<th>3-Ton Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 (15)</td>
<td>5/8&quot;</td>
<td>3/8&quot;</td>
<td>7/8&quot;</td>
<td>3/8&quot;</td>
<td>7/8&quot;</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>75 (23)</td>
<td>7/8&quot;</td>
<td>3/8&quot;</td>
<td>7/8&quot;</td>
<td>1/2&quot;</td>
<td>7/8&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>100 (30)</td>
<td>7/8&quot;</td>
<td>3/8&quot;</td>
<td>7/8&quot;</td>
<td>1/2&quot;</td>
<td>1-1/8&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>125 (38)</td>
<td>7/8&quot;</td>
<td>1/2&quot;</td>
<td>7/8&quot;</td>
<td>1/2&quot;</td>
<td>1-1/8&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>150 (45)</td>
<td>7/8&quot;</td>
<td>1/2&quot;</td>
<td>7/8&quot;</td>
<td>1/2&quot;</td>
<td>1-1/8&quot;</td>
<td>1/2&quot;</td>
</tr>
</tbody>
</table>

1. Suction-line and liquid-line sizing based on < 3 psi pressure drop in each and horizontal suction line refrigerant velocities > 700 FPM (3.6 m/s).
2. Suction sizes should be reduced one pipe size for vertical riser sections to maintain suction-line velocity > 1000 FPM (5.1 m/s) for proper oil return.

Source: DPN000788 Rev. 11
### Table 6.6 Equivalent lengths for various pipe fittings, ft (m)

<table>
<thead>
<tr>
<th>Copper Pipe OD, in.</th>
<th>90 Degree Elbow Copper</th>
<th>90 Degree Elbow Cast</th>
<th>45 Degree Elbow</th>
<th>Tee</th>
<th>Gate Valve</th>
<th>Globe Valve</th>
<th>Angle Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>0.8 (0.24)</td>
<td>1.3 (0.39)</td>
<td>0.4 (0.12)</td>
<td>2.5 (0.76)</td>
<td>0.26 (0.07)</td>
<td>7.0 (2.13)</td>
<td>4.0 (1.21)</td>
</tr>
<tr>
<td>5/8</td>
<td>0.9 (0.27)</td>
<td>1.4 (0.42)</td>
<td>0.5 (0.15)</td>
<td>2.5 (0.76)</td>
<td>0.28 (0.08)</td>
<td>9.5 (2.89)</td>
<td>6.0 (1.86)</td>
</tr>
<tr>
<td>3/4</td>
<td>1.0 (0.3)</td>
<td>1.5 (0.45)</td>
<td>0.6 (0.18)</td>
<td>2.5 (0.76)</td>
<td>0.30 (0.09)</td>
<td>12.0 (3.65)</td>
<td>6.5 (1.98)</td>
</tr>
<tr>
<td>7/8</td>
<td>1.45 (0.44)</td>
<td>1.8 (0.54)</td>
<td>0.8 (0.24)</td>
<td>3.6 (1.09)</td>
<td>0.36 (0.11)</td>
<td>17.2 (5.24)</td>
<td>9.5 (2.89)</td>
</tr>
<tr>
<td>1-1/8</td>
<td>1.85 (0.56)</td>
<td>2.2 (0.67)</td>
<td>1.0 (0.3)</td>
<td>4.6 (1.4)</td>
<td>0.48 (0.14)</td>
<td>22.5 (6.85)</td>
<td>12.0 (3.65)</td>
</tr>
<tr>
<td>1-3/8</td>
<td>2.4 (0.73)</td>
<td>2.9 (0.88)</td>
<td>1.3 (0.39)</td>
<td>6.4 (1.95)</td>
<td>0.65 (0.19)</td>
<td>32.0 (9.75)</td>
<td>16.0 (4.87)</td>
</tr>
<tr>
<td>1-5/8</td>
<td>2.9 (0.88)</td>
<td>3.5 (1.06)</td>
<td>1.6 (0.48)</td>
<td>7.2 (2.19)</td>
<td>0.72 (0.21)</td>
<td>36.0 (10.97)</td>
<td>19.5 (5.94)</td>
</tr>
</tbody>
</table>

Refrigerant trap = Four times equivalent length of pipe per this table

### 6.1.2 Piping when Condensing Unit is Above or Below Evaporator

Refer to *Pipe length and condensing unit elevation relative to evaporator* below, for the maximum vertical rise/fall between condensing unit and evaporator.

When installing remote condensing units above the evaporator, trap the suction gas line at the evaporator as shown in *Figure 6.1* on the next page. This trap will retain refrigerant oil during the "Off" cycle. When the unit starts, oil in the trap is carried up the vertical riser and returns to the compressor. For rises over 25 ft (7.6 m), trap every 20 ft (6 m) or evenly divided.

When installing remote condensing units below the evaporator, trap the suction gas line with an inverted trap the height of the evaporator as shown *Figure 6.1* on the next page. This prevents refrigerant migration to the compressor during "Off" cycles. The maximum recommended vertical-level drop to condensing unit is 15 ft (4.6 m).

### Table 6.7 Pipe length and condensing unit elevation relative to evaporator

<table>
<thead>
<tr>
<th>Nominal System Size, ton</th>
<th>Maximum Equivalent Pipe Length, ft (m)</th>
<th>Maximum Condensing Unit Level Above Evaporator, ft (m)</th>
<th>Maximum Condensing Unit Level Below Evaporator, ft (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 and 2</td>
<td>150 (45)</td>
<td>40 (12)</td>
<td>15 (4.6)</td>
</tr>
<tr>
<td>3</td>
<td>150 (45)</td>
<td>50 (15)</td>
<td>15 (4.6)</td>
</tr>
</tbody>
</table>

Maximum recommended total equivalent pipe length is 150 ft (45 m). Suction and liquid lines may require additional specialty items when vertical lines exceed 20 ft (6 m) and/or condensing unit installation is more than 15 ft (4.6 m) below the evaporator. Contact Vertiv Technical Support for assistance.
Figure 6.1 Refrigerant piping diagram when condenser is above or below evaporator

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Condensing unit above evaporator</td>
</tr>
<tr>
<td>2</td>
<td>Condensing unit below evaporator</td>
</tr>
<tr>
<td>3</td>
<td>Evaporator</td>
</tr>
<tr>
<td>4</td>
<td>Condensing unit</td>
</tr>
</tbody>
</table>

6.2 Glycol-loop Piping

Contact Vertiv Application Engineering for assistance in choosing correct drycooler models. See DPN003822 included in the Submittal Drawings.
APPENDICES

Appendix A: Technical Support and Contacts

A.1 Technical Support/Service in the United States

Vertiv Services, Inc.
24x7 dispatch of technicians for all products.
1-800-543-2378

Liebert Thermal Management Products
1-800-543-2778

Liebert Channel Products
1-800-222-5877

Liebert AC and DC Power Products
1-800-543-2378

A.2 Locations

United States
Vertiv Headquarters
1050 Dearborn Drive
Columbus, OH, 43085, USA

Europe
Via Leonardo Da Vinci 8 Zona Industriale Tognana
35028 Piove Di Sacco (PD) Italy

Asia
7/F, Dah Sing Financial Centre
3108 Gloucester Road, Wanchai
Hong Kong
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Appendix B: Submittal Drawings

The submittal drawings are in the order of document part number (DPN). Table B.1 below, groups the drawings by topic/application.

Table B.1 Submittal-drawings Contents

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Title</th>
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<tbody>
<tr>
<td><strong>Planning Dimensions - Evaporators/Chilled-water Units</strong></td>
<td></td>
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<tr>
<td>DPN000262</td>
<td>Cabinet Dimensions, Evaporator/Chilled-water Unit</td>
</tr>
<tr>
<td>DPN000269</td>
<td>Cabinet Dimensions, Evaporator/Chilled-water Unit</td>
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<tr>
<td><strong>Planning Dimensions - Indoor Condensing Units</strong></td>
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<tr>
<td>DPN04420</td>
<td>Cabinet Dimensions, Air-cooled units</td>
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<tr>
<td>DPN04421</td>
<td>Cabinet Dimensions, Water/Glycol-cooled units</td>
</tr>
<tr>
<td><strong>Planning Dimensions - Outdoor Condensing Units</strong></td>
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</tr>
<tr>
<td>DPN004418</td>
<td>Cabinet Dimensions, Prop-fan Condensing Unit with horizontal air discharge</td>
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<tr>
<td>DPN003094</td>
<td>Optional Anchorage Plan, Prop-fan Condensing Unit with horizontal air discharge</td>
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<tr>
<td><strong>Piping General Arrangement</strong></td>
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<tr>
<td>DPN004406</td>
<td>Piping, Air-cooled models</td>
</tr>
<tr>
<td>DPN004405</td>
<td>Piping, Split-system Water/Glycol models</td>
</tr>
<tr>
<td>DPN004403</td>
<td>Piping, Close-coupled Water/Glycol and Chilled-water models</td>
</tr>
<tr>
<td>DPN003822</td>
<td>Multiple Drycoolers and Cooling Units on Common Glycol Loop</td>
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<tr>
<td><strong>Piping Connections - Evaporator and Chilled-water Units</strong></td>
<td></td>
</tr>
<tr>
<td>DPN004306</td>
<td>Piping Connections</td>
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<tr>
<td><strong>Condensate-pump Connection</strong></td>
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</tr>
<tr>
<td>DPN004306</td>
<td>Field-installed pump connection</td>
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<td><strong>Piping Connections - Split-system Indoor Condensing Units</strong></td>
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</tr>
<tr>
<td>DPN004420</td>
<td>Piping Connections, Air-cooled condensing unit</td>
</tr>
<tr>
<td>DPN004421</td>
<td>Piping Connections, Water/Glycol-cooled condensing unit</td>
</tr>
<tr>
<td>DPN004309</td>
<td>Piping Connections, Close-coupled Water/Glycol-cooled units</td>
</tr>
<tr>
<td><strong>Electrical Connections - Evaporator and Chilled-water Units</strong></td>
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</tr>
<tr>
<td>DPN000264</td>
<td>Electrical Connections, Air-cooled and Chilled-water units</td>
</tr>
<tr>
<td>DPN000271</td>
<td>Electrical Connections, Water/Glycol-cooled units</td>
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<td>DPN003990</td>
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<tr>
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<td>Electrical Connections, Air-cooled</td>
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<tr>
<td>DPN000209</td>
<td>Electrical Connections, Water/Glycol-cooled units</td>
</tr>
</tbody>
</table>
ELECTRICAL FIELD CONNECTIONS
2 & 3 TON AIR COOLED INDOOR CONDENSING MODULE

Field supplied unit disconnect switch when factory unit disconnect is not provided in unit.

Single or three phase electric service not by Liebert.

Field supplied 24V NEC class 2 wiring to Fan/Coil unit.

Line voltage electric power supply conduit entrance.

Factory installed disconnect switch.

Factory wired to components on electric panel.

Connection terminal for field supplied earth grounding wire.

Low voltage electric power supply entrance.


Wire connections from evaporator mod:
1. 24V GRD
2. 24V Supply
3. High Pressure Alarm (OPT)
4. Hot Gas Bypass Connection

Left End View

NOTES:
1. Refer to specification sheet for full load amp and wire size amp. ratings.
2. Control voltage wiring must be a minimum of 16GA (1.3mm) for up to 75’ (23m) or not to exceed 1 volt drop in control line.
**ELECTRICAL FIELD CONNECTIONS**

2 & 3 TON WATER/GLYCOL COOLED INDOOR CONDENSING MODULE

**NOTES:**
1. Refer to specification sheet for full load amp and wire size amp ratings.
2. Control voltage wiring must be a minimum of 16GA (1.3mm) for up to 75' (23m) or not to exceed 1 volt drop in control line.
CABINET DIMENSIONAL DATA
FAN/COIL & CHILLED WATER MODULE

SHADED AREAS INDICATE A RECOMMENDED CLEARANCE OF 34" (864mm) BE PROVIDED IN THE FRONT OF THE UNIT.

GRILLES ARE REVERSIBLE TO ALLOW AIR DIRECTION CHANGES AS SHOWN BY THE ARROWS.

DME020E 46 1/2 (1181) 33 3/4 (857) 34 7/16 (874) 230 (104)
DME027E 330 (150)
DME037E
DME044C

A
Removable Access Panel

B
Knockouts for customer low and high voltage connections

C
Knockout Dia. 7/8" (22mm) for Customer Drain Line

FLOOR CUTOUT DIMENSIONS

UNIT OPERATING WEIGHT. lbs. (kg)

A
B
C

DME020E 46 1/2 (1181) 33 3/4 (857) 34 7/16 (874) 230 (104)
DME027E 330 (150)
DME037E 64 1/8 (1628) 51 1/2 (1308) 52 3/16 (1325) 365 (165)
DME044C

Knockout Dia. 1/2" (13mm) for Humidifier Fill Line
ELECTRICAL FIELD CONNECTIONS
FAN/COIL & CHILLED WATER SYSTEMS

Common Alarm Connection. Field supplied 24V Class 1 wiring to common alarm connection TB5-9 and TB5-10.

Site Monitoring Connection. Terminals TB5-77 (-) TB5-78 (+) are for connection of field supplied, twisted pair, communication cable to optional iCOM CMS or SiteScan.

Remote Unit Shutdown. Replaces existing jumper between terminals TB5-37 and TB5-38 with normally closed switch having a minimum 75 VA rating. Use field supply 24V Class 1 wire.

Entrances for high voltage single phase electric.

Entrances for low voltage connections.

Customer Remote Alarm Connection. Field supplied 24V Class 1 wiring to connection TB6-1, 2, 3.

Entrance for high voltage single phase electric.

Field supplied, field wired thermostat wire to remote wall box.

Heat Rejection Connection. Field supplied 24V (NEC Class 1 wiring) for remote air cooled units from terminals TB5-1 through TB5-4 in Fan/Coil module to wires 1 through 4 in the condensing module.

1. 24V GND
2. 24V Supply
3. High Pressure Alarm (OPT)
4. Hot Gas Bypass Connection

Remote Control Panel Connections to TB5-5, 6, 7, 8 connected with field supplied Thermostat wire (22ga. shielded/jacketed: available from Liebert and others).

Recommended disconnect switch located within sight of unit. Not by Liebert.

High Volt Power Connections Electric service connection terminals

Entrances for low voltage connections.

Earth Ground Connection Connections terminal for field supplied earth grounding wire.

Transformer connection Unit wired for 230 Volts. For 208V connection, replace the yellow wire with orange wire. Refer to Schematic

Common Alarm Connection. Field supplied 24V Class 1 wiring to common alarm connection TB5-9 and TB5-10.

Remote Unit Shutdown. Replaces existing jumper between terminals TB5-37 and TB5-38 with normally closed switch having a minimum 75 VA rating. Use field supply 24V Class 1 wire.

Site Monitoring Connection. Terminals TB5-77 (-) TB5-78 (+) are for connection of field supplied, twisted pair, communication cable to optional iCOM CMS or SiteScan.

Recommended disconnect switch located within sight of unit. Not by Liebert.

NOTE: Refer to specification sheet for full load amp. and wire size amp. ratings.
CABINET DIMENSIONAL DATA
WATER/GLYCOL COOLED CONDENSING MODEL

WALL MOUNT LAYOUT 
KEYHOLE SLOTS

<table>
<thead>
<tr>
<th>Model</th>
<th>Unit Operating Weight lbs. (kg)</th>
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<td>DMC022WG</td>
<td>169 (77)</td>
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<tr>
<td>DMC029WG</td>
<td>172 (78)</td>
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SHADED AREA INDICATES A RECOMMENDED CLEARANCE OF 34" (864mm) BE PROVIDED ON THE FRONT OF THE UNIT AND 12" (305mm) ON THE LEFT SIDE FOR COMPONENT ACCESS AND REMOVAL. MINIMUM CLEARANCE IS 1" (25mm) ON LEFT SIDE AND 18" (457mm) IN FRONT.
ELECTRICAL FIELD CONNECTIONS
WATER/GLYCOL COOLED MODELS

NOTE: Refer to specification sheet for full load amp. and wire size amp. ratings.
**LIEBERT PFH**

**OPTIONAL ANCHORAGE PLAN**

Top View

Some Parts Not Shown For Clarity

---

### MODEL NUMBERS

<table>
<thead>
<tr>
<th>60 HZ</th>
<th>50 HZ</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E (min)</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
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<tbody>
<tr>
<td>PFH014A-L</td>
<td>NA</td>
<td>6-5/8 (160)</td>
<td>30-1/4 (769)</td>
<td>2-1/2 (64)</td>
<td>8-1/2 (216)</td>
<td>1 (25)</td>
<td>6-1/2 (165)</td>
<td>13-13/16 (351)</td>
<td>15 (381)</td>
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<td>PFH020A-L</td>
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<td>9-9/16 (242)</td>
<td>37-1/8 (943)</td>
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<td>2-9/16 (64)</td>
<td>13-1/8 (333)</td>
<td>14-3/4 (375)</td>
<td>13-1/4 (337)</td>
<td>2-1/4 (57)</td>
<td>7-1/8 (181)</td>
<td>6-3/8 (162)</td>
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<td>2-9/16 (64)</td>
<td>13-1/8 (333)</td>
<td>14-3/4 (375)</td>
<td>13-1/4 (337)</td>
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<td>6-3/8 (162)</td>
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<td>13-1/8 (333)</td>
<td>14-3/4 (375)</td>
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<td>PFH036A-L</td>
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<td>2-1/4 (57)</td>
<td>7-1/8 (181)</td>
<td>6-3/8 (162)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. Front Grille and Right End Panel will need to be removed to access anchor holes, Top panel may be removed for additional access. All removed parts must be reinstalled.
2. 1/2" (13mm) Diameter hole, use for unit anchor.
3. All dimensions have a tolerance of ±1/16".
5. The use of this anchor plan is optional and installer will assume responsibility for suitable anchorage.
6. Supply and return piping connections

---

Partial Front View

3/8" (10mm) Field supplied spacer

Typical 4 places
COMMUNICATION CONNECTION OPTIONS
LIEBERT MINI-MATE2, LIEBERT DATAMATE, & LIEBERT SRC

BMS 485 option
(1 Cooling Unit only)

1. Building Management System (BMS) Protocols over RS485
   *BACNet over RS485/IP
   *Modbus over RS485/IP
2. Cloud access provided via BMS IP Connectivity
3. RS-485 wiring is field supplied
   - 22-18AWG stranded & shielded cable.
   - Must be rated to meet local codes and conditions.
   - Example: Belden 9461 (non-plenum rated) or Belden 88761 (plenum rated) or equivalent.

SiteLink option
(1 Cooling Unit only)

1. SiteLink Connection
   Web Adapter Card not required
2. Cloud access provided via BMS IP Connectivity
3. RS-485 wiring is field supplied
   - 22-18AWG stranded & shielded cable.
   - Must be rated to meet local codes and conditions.
   - Example: Belden 9461 (non-plenum rated) or Belden 88761 (plenum rated) or equivalent.

Team Work, Lead-Lag using AC4 (Liebert Mini-Mate2 and DataMate only)

<table>
<thead>
<tr>
<th>CMS COMMS CONNECTION</th>
<th>TERMINAL</th>
<th>PIN</th>
<th>PIN</th>
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<tr>
<td>iCOM CMS 485-1</td>
<td>TB4</td>
<td>1</td>
<td>2</td>
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<tr>
<td>iCOM CMS 485-1</td>
<td>77, 78</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>iCOM CMS 485-1</td>
<td>TB5</td>
<td>77</td>
<td>78</td>
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</tbody>
</table>
LIEBERT DRYCOOLER

MULTIPLE DRYCOOLERS & COOLING UNITS ON COMMON GLYCOL LOOP

HP (kW) GPM (L/s) Per Pump @ ___(kPa)

PUMP PACKAGE

TANK

DRYCOOLER NO. 1 MODEL________

GPM (L/s) _______ ΔP:_______Ft (kPa)

DRYCOOLER NO. 2 MODEL________

GPM (L/s) _______ ΔP:_______Ft (kPa)

COOLING UNIT #___

MODEL _______

GPM (L/s) _______

ΔP Fl (kPa): _______

COOLING UNIT #___

MODEL _______

GPM (L/s) _______

ΔP Fl (kPa): _______

COOLING UNIT #___

MODEL _______

GPM (L/s) _______

ΔP Fl (kPa): _______

COOLING UNIT #___

MODEL _______

GPM (L/s) _______

ΔP Fl (kPa): _______

COOLING UNIT #___

MODEL _______

GPM (L/s) _______

ΔP Fl (kPa): _______

COOLING UNIT #___

MODEL _______

GPM (L/s) _______

ΔP Fl (kPa): _______

COOLING UNIT #___

MODEL _______

GPM (L/s) _______

ΔP Fl (kPa): _______

NOTES:
1. PRESSURE AND TEMPERATURE GAUGES (OR PORTS FOR SAME) ARE RECOMMENDED TO MONITOR COMPONENT PRESSURE DROPS AND PERFORMANCE.
2. FLOW MEASURING DEVICES, DRAIN AND BALANCING VALVES TO BE SUPPLIED BY OTHERS AND LOCATED AS REQUIRED.
3. SEE PRODUCT LITERATURE FOR INSTALLATION GUIDELINES AND CLEARANCE DIMENSIONS.
4. DRAWING SHOWS DUAL PUMP PACKAGE. ALTERNATE PUMP PACKAGES WITH MORE PUMPS MAY BE CONSIDERED, CONSULT SUPPLIER.
5. DEPENDING ON THE DRYCOOLER COIL CIRCUITING IT MAY HAVE 2 IN/OUT OR 4 IN/OUT CONNECTION POINTS.
6. INSTALL EXPANSION OR COMPRESSION TANK AT THE HIGHEST POINT OF THE SYSTEM.
LIEBERT DATAMATE

GENERAL ARRANGEMENT & DIMENSIONAL DATA
LIEBERT iCOM CMS

Recommended disconnect switch located within sight of unit. Not provided by Liebert.

Notes:
1. Connection for optional SiteLink System.
2. Communication to Liebert DataMate unit.
3. Refer to DPN003556 for field communication connections.
4. Shaded areas indicate a recommended minimum clearance be provided for component access.
5. Locate the CMS Enclosure within 6' (1.8m) (length of power cord) of a 120V wall receptacle. Refer to DPN003556 for field communication connections.
FAN/COIL & CHILLED WATER MODULES

PRIMARY CONNECTION LOCATIONS

LIEBERT DATAMATE

FIELD INSTALLED

A – Liquid Refrigerant Line (Chilled Water-In)

B – Suction Refrigerant Line (Chilled Water-Out)

3/4" (19mm) Hose Barb
Field pitch a minimum of 1/8" per ft. (13mm per meter)

Condensate Pump
location in unit

Optional steam generating humidifier.

1/4" (6mm) O.D. plastic compression fitting. Use copper lines for humidifier supply line.

1/2" (13mm) hose barb Humidifier Drain. Field pitch a minimum of 1/8" per ft. (13mm per meter). The pipe material must be rated for 212°F (100°C) as humidifier will discharge hot water periodically.

3/8" (10mm) hose barb
Connect to customer drain tube (rated for 212°F (100°C) if humidifier is used). Note that trap may be required per local codes.

3/4" (19mm) hose barb
Provided with the kit. Humidifier connection rated to 212°F (100°C)

1/2" (13mm) hose barb
Provided with the kit. Evaporator Drain connection rated to 140°F (60°C)

Optional steam humidification discharge grille

OPTIONAL CONDENSATE PUMP
(FIELD INSTALLED)

UNIT PIPING OUTLET CONNECTION SIZES O.D. CU

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>LIQUID LINE</th>
<th>SUCTION LINE</th>
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<tbody>
<tr>
<td>DME020E</td>
<td>3/8&quot;</td>
<td>5/8&quot;</td>
</tr>
<tr>
<td>DME027E</td>
<td>3/8&quot;</td>
<td>7/8&quot;</td>
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<tr>
<td>DME037E</td>
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<td></td>
</tr>
<tr>
<td>DME044C</td>
<td>7/8&quot;</td>
<td>7/8&quot;</td>
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WATER INLET | WATER OUTLET
PRIMARİE CONNECTİON LOCATIOŇS
WATER/GLYCOL CONDENSİNG UNIT

NOTE: DO NOT REMOVE EVAPORATOR END PANEL FROM PANEL ASSEMBLY WHEN INSTALLING INTERNAL WATER/GLYCOL CONDENSING UNIT.

### Removable Panels
- Piping access plate in evaporator end panel
- Piping and electrical knockouts located on bottom and rear of unit
- C - supply entering condenser water/glycol
- D - return leaving condenser water/glycol

### Piping and Electrical Knockouts
- Located on bottom and rear of unit

### Outline of evaporator module
- A - liquid refrigerant line
- B - suction refrigerant line

### Connection Sizes

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>UNIT REFRIGERANT CONNECTION SIZES O.D. CU</th>
<th>WATER/GLYCOL PIPING CONNECTION SIZES O.D. CU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LIQUID LINE A</td>
<td>SUCTION LINE B</td>
</tr>
<tr>
<td>DMC022WG</td>
<td>3/8&quot;</td>
<td>5/8&quot;</td>
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<tr>
<td>DMC029WG</td>
<td></td>
<td>7/8&quot;</td>
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<tr>
<td>DMC040WG</td>
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</table>
Notes:

⚠ Components are not supplied by Liebert, but are required for proper circuit operation and maintenance.
Notes:

1. Components are not supplied by Liebert but are required for proper circuit operation and maintenance.
GENERAL ARRANGEMENT DIAGRAM
SPLIT SYSTEMS AIR COOLED

Condenser Coil

High Pressure Switch

Schrader Port w/ Valve Core

Scroll Compressor

Hot Gas Bypass Solenoid Valve

3 - Way Head Pressure Relief Valve

Sight Glass

Lee - Temp Receiver

Evaporator Coil

Filter Drier

Expansion Valve

Schrader Port w/ Valve Core (MCD Only)

Sensing Bulb

External Equalizer

Schrader Port w/ Valve Core

Liquid Injection Valve Bulb

Schrader Port w/ Valve Core (PFH Only)

Schrader Port w/ Valve Core

Liquid Injection

Heater Pressure Limiting Switch

Receiver Heater Pressure Limiting Switch

Suction Line

3/8" SAE 45° Male Flare (MCD) or Atmospheric (PFH)

Pressure Relief Valve

Check Valve

Liquid Line

3 Way Head

Liquid Line Solenoid Valve

FIELD PIPING

FACTORY PIPING

DPN004406
Page 1/1

REV : 1
REV DATE : 1/18
LIEBERT PFH

CABINET DIMENSIONAL DATA
CONDENSING UNIT W/ HORIZONTAL AIR DISCHARGE

MODEL NUMBERS | DIMENSIONAL DATA IN. (mm) | MODULE WEIGHT lbs. (kg) net.
--- | --- | ---
60 HZ | 50HZ | A | B | C | |
PFH014A-L | NA | 40 (1016) | 23 1/2 (597) | 18 (457) | 200 (91) |
PFH020A-L | NA | 48 (1219) | 31 (787) | 18 (457) | 241 (109) |
PFH027A-L | NA | 53 (1343) | 36 1/4 (918) | 18 (457) | 351 (159) |
PFH027A-H | NA | 18 (457) | 18 (457) |
PFH037A-L | PFH036A-L |
PFH042A-L | PFH041A-L |
PFH037A-H | PFH036A-H |
PFHZ37A-L | PFHZ36A-L |
PFH042A-H | PFH041A-H |
PFHZ42A-L | PFHZ41A-L |
PFH067A-L | PFH066A-L |
CABINET DIMENSIONAL DATA & PRIMARY CONNECTION LOCATIONS

2 & 3 TON INDOOR CONDENSING MODELS

<table>
<thead>
<tr>
<th>Model #</th>
<th>Dimensions in. (mm)</th>
<th>Unit Net Wt. lbs. (kg)</th>
<th>Refrigeration Connection Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>MC*24A</td>
<td>1-7/16 (37)</td>
<td>11-7/16 (290)</td>
<td>1/2 (13)</td>
</tr>
<tr>
<td>MC*35A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC*40A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC*39A</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

7/8" (22.2mm) Dia. Electrical Entrance for Line Voltage Connection.
7/8" (22.2mm) Dia. Electrical Entrance for Low Voltage Connection.
LIEBERT MINI-MATE2

CABINET DIMENSIONAL DATA & PRIMARY CONNECTION LOCATIONS

2 & 3 TON WATER/GLYCOL COOLED INDOOR CONDENSING MODULE

DIMENSIONAL DATA

<table>
<thead>
<tr>
<th>Model #</th>
<th>Unit Net Weight</th>
<th>Refrigerant Connection Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lbs. (kg)</td>
<td>O.D. Cu</td>
</tr>
<tr>
<td></td>
<td>60 Hz</td>
<td>50 Hz</td>
</tr>
<tr>
<td>MC*26W</td>
<td>N/A</td>
<td>175 (79)</td>
</tr>
<tr>
<td>MC*38W</td>
<td>MC*37W</td>
<td>220 (100)</td>
</tr>
<tr>
<td>MC*44W</td>
<td>MC*43W</td>
<td></td>
</tr>
</tbody>
</table>

7/8" (22.2mm) OD CU Water/Glycol Inlet Connection.

7/8" (22.2mm) OD CU Water/Glycol Outlet Connection.

7/8" (22mm) Dia. Electrical Entrance for High Voltage Connection.

7/8" (22mm) Dia. Electrical Entrance for Low Voltage Connection.
Appendix C: Guide Specifications

The following are the guide specifications for the Liebert® DataMate.
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1.0 General

1.1 SUMMARY
These specifications describe requirements for a Thermal Management system. The system shall be
designed to control temperature and humidity conditions in rooms containing electronic equipment,
with good insulation and vapor barrier.

The manufacturer shall design and furnish all equipment to be fully compatible with heat
dissipation requirements of the room.

1.2 DESIGN REQUIREMENTS
The Thermal Management system shall be a Liebert DataMate factory assembled unit. The
refrigeration system shall be split, with the compressor located in a remote or close-coupled
condensing unit. The evaporator section shall be specifically designed for floor or wall-mounted
installation and serviceable from the front of the system. Condensing units shall be designed for
outdoor or indoor mounting, below the raised floor, above-dropped-ceiling, or in room installation.
Refer to Section 2.3 for condensing unit guide specifications.

Standard 60 Hz units shall be CSA-certified to the harmonized U.S. and Canadian product safety
standard, “CSA C22.2 No 236/UL 1995 for Heating and Cooling Equipment” and are marked with
the CSA c-us logo.

The system shall be AHRI Certified™, the trusted mark of performance assurance for heating,
ventilation, air conditioning and commercial refrigeration equipment, using AHRI Standard 1360.

1.3 SUBMITTALS
Submittals shall be provided with the proposal and shall include: Single-Line Diagrams;
Dimensional, Electrical, and Capacity data: Piping and Electrical Connection Drawings.

1.4 QUALITY ASSURANCE
The specified system shall be factory tested before shipment. Testing shall include, but shall not be
limited to: Quality Control Checks, “Hi-pot” Test (two times rated voltage plus 1000 volts, per NRTL
agency requirements), and Metering Calibration Tests. The system shall be designed and
manufactured according to world class quality standards. The manufacturer shall be ISO 9001
certified.

1.5 ACCEPTABLE ALTERNATIVES
Acceptable alternatives shall be permitted with engineer's prior approval only. Contractor to submit
a detailed summary form listing all variations to include size deviations, electrical load differences,
functional and component changes and savings to end user.
2.0 Product

2.1 STANDARD FEATURES/ALL SYSTEMS

2.1.1 Evaporator Cabinet and Frame Construction
The cabinet and chassis shall be constructed of heavy gauge, painted furniture steel. The cabinet shall be designed for easy installation and service access from the front only.

2.1.2 Air Distribution
The air distribution system shall be constructed with a quiet, direct-drive fan assembly equipped with multiple double-inlet blowers, self-aligning sleeve bearings, and lifetime lubrication. Fan motor(s) shall be permanent-split capacitor, high efficiency type, equipped with two speeds for airflow modulation. Dehumidification shall utilize the lower fan speed.

Air filter shall be a cleanable polypropylene monofilament type over expanded aluminum with aluminum frame with a MERV4 rating based on ASHRAE 52.2-007. It shall be easily removable from the front of the system by means of quarter-turn fasteners and shall not require system shutdown for service.

2.1.3 Microprocessor Control System
The control system shall be microprocessor-based, factory-wired into the system and tested prior to shipment. The wall-mounted control enclosure shall include a 2-line by 16-character LCD providing continuous display of operating status and alarm condition. An 8-key membrane keypad for setpoint/program control, fan speed selection and unit On/Off shall be located below the display. The control display shall be field-wired to the control board using 4-conductor field-supplied thermostat wire.

Temperature and humidity sensors shall be located in the wall box, which shall be capable of being located up to 300 ft (91.4m) from the evaporator unit.

2.1.3.1 Monitoring
The LCD shall provide On/Off indication, operating mode indication (cooling, heating, humidifying, dehumidifying), fan speed indication and current day, time, temperature and humidity (if applicable) indication. The monitoring system shall be capable of relaying unit operating parameters and alarms to the Liebert iCOM CMS and/or the Liebert SiteScan® monitoring systems.

2.1.3.2 Control Setpoint Parameters

- Temperature Setpoint: 65-85°F (18 to 29°C)
- Temperature Sensitivity: 1 to 9.9°F (1 to 5°C)
- Humidity Setpoint: 20-80% RH
- Humidity Sensitivity: 1 to 30% RH

The microprocessor can be set within these ranges; however, the unit may not be able to control to extreme combinations of temperature and humidity.
2.1.3.3 Unit Controls

2.1.3.3.1 Compressor Short-Cycle Control
The control system shall prevent compressor short-cycling by a 3-minute timer from compressor stop to the next start.

2.1.3.3.2 Common Alarm and Remote On/Off
A common alarm relay shall provide a contact closure to a remote alarm device. Two (2) terminals shall also be provided for remote On/Off control. Individual alarms shall be “enabled” or “disabled” from reporting to the common alarm.

2.1.3.3.3 Setback Control
The control shall be user-configurable to use a manual setpoint control or a programmable, time-based setback control. The setback control will be based on a 5 day/2 day programmed weekly schedule with capability of accepting 2 events per program day.

2.1.3.3.4 Temperature Calibration
The control shall include the capabilities to calibrate the temperature and humidity sensors and adjust the sensor response delay time from 10 to 90 seconds. The control shall be capable of displaying temperature values in °F or °C.

2.1.3.3.5 System Auto Restart
For startup after power failure, the system shall provide automatic restart with a programmable (up to 9.9 minutes in 6-second increments) time delay. Programming can be performed either at the wall-mounted controller or from the central, site-monitoring system.

2.1.4 Alarms

2.1.4.1 Unit Alarms
The control system shall monitor unit operation and activate an audible and visual alarm in the event of the following factory preset alarm conditions.

- High Temperature (max 90°F, 32.2°C)
- Low Temperature (min 35°F, 1.7°C)
- High Humidity (max 85% RH)
- Low Humidity (min 15% RH)
- High Water Alarm - Lockout Unit Operation
- High Head Pressure
- Loss of Power
- Compressor Short Cycle

2.1.4.2 Custom Alarms (2x)

- Humidifier Problem
- Water Detected
- Custom Alarm (1)
- Custom Alarm (2)

User-customized text can be entered for the two (2) custom alarms
2.1.4.3 **Alarm Controls**

Each alarm (unit and custom) shall be individually enabled or disabled (except for high head pressure and high water in condensate pan) and can be programmed for a time delay of 0 to 255 seconds of continuous alarm condition to be recognized as an alarm. Each alarm shall also be enabled or disabled to activate the common alarm (except high head pressure and high water in condensate pan).

2.1.4.4 **Audible Alarm**

The audible alarm shall annunciate at the LCD wall box any alarm that is enabled by the operator.

2.1.4.5 **Common Alarm**

A programmable common alarm shall be provided to interface user selected alarms with a remote alarm device.

2.1.4.6 **Remote Monitoring and Control—iCOM CMS and BMS**

The Liebert iCOM CMS system shall provide hardware, Web Interface, Administration Portal, and Mobile Apps to remotely view, control, and monitor the Liebert DataMate system. The CMS web card shall be field mounted with communications wiring routed from the Liebert DataMate system to the CMS control board, power provided separate from the Liebert DataMate unit, and Ethernet cable providing network access to the world-wide web or to a BMS if required. The iCOM CMS Mobile App shall provide real-time, read-only data from each Liebert DataMate registered and wired to an iCOM CMS system. Notifications shall be provided via SMS text message or email to each registered User who has been added to the Administration portal and assigned to receive alarm notifications from a unit. BMS protocols available on iCOM CMS shall be BACnet IP, BACnet MSTP, Modbus TCP/IP, Modbus RTU, and SNMP v1, v2.

The iCOM CMS Web Interface shall be used to register systems to the Mobile Cloud, remotely access unit-level display settings via a web URL which shall provide read/write capability to the Liebert DataMate system for setpoints, alarms, sensor calibration and other settings found on the unit level display.

2.1.4.7 **Remote Monitoring - Liebert SiteScan**

All alarms shall be communicated to the Liebert site-monitoring system with the following information: date and time of occurrence, unit number and present temperature and humidity.

2.2 **CHILLED WATER SYSTEM COMPONENTS**

2.2.1 **Chilled Water Control**

The water circuit shall include a 2-way slow-close On/Off solenoid valve. Design pressure shall be 300psi (2068kPa) with a maximum close-off pressure of 60psi (414kPa). Valve shall be spring return.

2.2.2 **Chilled Water Coil**

The cooling coil shall have a minimum of 2.6 ft.² (.24m²) face area, 3 rows deep. It shall be constructed of copper tubes and aluminum fins and be mounted in a galvanized condensate drain pan. The coil shall be designed for a maximum face velocity of ___FPM (m/s) at ___ CFM (CMH). The water circuit shall be designed to distribute water into the entire coil face area. The coil shall be supplied with ___ °F (°C) entering water temperature, with a ___°F (°C) temperature rise. The coil shall be supplied with ___ GPM (l/s) of chilled water and the pressure drop shall not exceed _____ psi (kPa).
2.2 DIRECT EXPANSION SYSTEM COMPONENTS

2.2.1 Direct Expansion Coil

The evaporator section shall include an evaporator coil, thermostatic expansion valve and filter-drier.

The evaporator coil shall have ___ ft.² (m²) face area, ___ rows deep. It shall be constructed of copper tubes and aluminum fins and have a maximum face velocity of ___ FPM (m/s) at _____ CFM (CMH). An externally equalized thermostatic expansion valve shall control refrigerant flow. The coil shall be provided with a galvanized steel drain pan. The evaporator refrigerant piping shall be spun-closed and filled with a nitrogen holding charge. Field relief of the Schrader valves shall indicate a leak-free system. The evaporator unit can be coupled directly with a water/glycol condensing unit or mounted remote to the indoor or outdoor condensing unit. Evaporator and condensing unit shall be field piped using copper lines, brazed, evacuated and field charged with R-407C refrigerant.

2.3 INDOOR AIR-COOLED CENTRIFUGAL FAN CONDENSING UNIT

Condensing unit components shall include condenser coil, scroll compressor, high-pressure switch, Liebert Lee-Temp™ refrigerant receiver, head pressure control valve, hot gas bypass system and liquid line solenoid valve. The hot gas bypass circuit shall be provided to reduce compressor cycling and improve operation under low-load conditions. Units available for [(2-ton)(3-ton)] systems.

All components shall be factory-assembled. The condensing unit refrigerant piping shall be spun-closed and filled with a nitrogen holding charge. Field relief of the Schrader valves shall indicate a leak-free system. Evaporator and condensing unit shall be field piped using copper lines, brazed, evacuated and field charged with R-407C refrigerant. Condensing unit shall be designed for 95°F (35°C) ambient and be capable of operation to -30°F (-34°C). The condensing unit shall be mounted remote to the evaporator.

The condensing coil shall be constructed of copper tubes and aluminum fins. The condenser fan shall be centrifugal type, double inlet, direct drive and shall operate at 1050 rpm (890 rpm @ 50 Hz). The fan and motor shall be mounted on vibration isolators. The condenser fan shall be designed for ___CFM (CMH) at ____” (mm) w.g. external static pressure.

2.3 OUTDOOR AIR-COOLED PROP FAN CONDENSING UNIT

Condensing unit components shall include a condenser coil, a direct-drive propeller-type fan, a scroll compressor, high-pressure switch, Liebert Lee-Temp receiver and head pressure control valve, hot gas bypass system and liquid line solenoid valve. A hot gas bypass system shall be provided to reduce compressor cycling and improve operation under low load conditions.

All components shall be factory-assembled. The condensing unit refrigerant piping shall be spun-closed and filled with a nitrogen holding charge. Field relief of the Schrader valves shall indicate a leak-free system. Evaporator and condensing unit shall be field piped using copper lines, brazed, evacuated and field charged with R-407C refrigerant. Condensing unit shall be designed for 95°F (35°C) ambient and be capable of operation to -30°F (-34.4°C).

The condenser coil shall be constructed of copper tubes and aluminum fins.

(Option) The 2- or 3-ton condensing unit shall be designed to operate at a sound level less than 58dBA.

(Option) The 2- or 3-ton condensing unit shall be designed for design ambient operation of 105°F (40.6°C).

(Option) The condenser coil shall be phenolic-coated for extended coil life in coastal areas.
2.3 **INDOOR CLOSE-COUPLED WATER/GLYCOL CONDENSING UNIT**
The water/glycol-cooled condensing unit shall include a scroll compressor and a water/glycol cooled condenser, and shall be capable of being close-coupled to the evaporator module. The water/glycol cooled condenser shall be designed to balance the heat rejection at ______ °F (°C) entering water/glycol temperature with a flow rate of ___ GPM (l/s) and have a total system pressure drop of _____ ft of water (kPa). An adjustable two-way water regulating valve shall be included. The condenser water/glycol circuit shall be designed for a static operating pressure of 150psi (1034kPa).

All components shall be factory-assembled. The condensing unit refrigerant piping shall be spun-closed and filled with a nitrogen holding charge. Field relief of the Schrader valves shall indicate a leak-free system. Evaporator and condensing unit shall be field piped using copper lines, brazed, evacuated and field charged with R-407C refrigerant. An integral wiring harness for single point power connection shall be provided for field wiring of evaporator and condensing unit together.

2.3 **INDOOR REMOTE WATER/GLYCOL-COOLED CONDENSING UNIT**
The water/glycol condensing unit shall include a scroll compressor, high-pressure switch, coaxial condenser, water-regulating valve, hot gas bypass system and liquid line solenoid valve. A hot gas bypass circuit shall be provided to reduce compressor cycling and improve operation under low-load conditions. The condensing unit refrigerant piping shall be spun-closed and filled with a nitrogen holding charge. Field relief of the Schrader valves shall indicate a leak-free system. Evaporator and condensing unit shall be field piped using copper lines, brazed, evacuated and field charged with R-407C refrigerant. Units available for [(2-ton)(3-ton)] systems.

The water/glycol condensing unit shall be equipped with a coaxial condenser having a total system pressure drop of ______ ft. of water (kPa) and a flow rate of ______ GPM (l/s) with ______ °F (°C) entering water/glycol temperature.

The condenser circuit shall be pre-piped with a [(2-way) (3-way)] regulating valve which is head-pressure actuated.

The condenser water/glycol circuit shall be designed for a static operating pressure of [(150psi (1034kPa)) (350 PSI (2413 kPa))].

2.4 **FACTORY-INSTALLED OPTIONS**
2.4.1 **Electric Reheat**
The electric reheat shall be low-watt density, tubular element and shall include agency approved safety switch to protect the system from overheating. The capacity of the reheat coil shall be ______ BTU/HR. ____ kW, controlled in 1 stage.

2.4.2 **Steam Generating Humidifier**
The environmental control system shall be equipped with a steam generating humidifier that is controlled by the microprocessor control system. It shall be complete with disposable canister, all supply and drain valves, 1" (25.4mm) air gap on fill line, inlet strainer, steam distributor, and electronic controls. The need to change canister shall be annunciated on the microprocessor wall-box control panel. The humidifier shall have a capacity of 3 lb./hr. (1.4kg/h). An LED light on the humidifier assembly shall indicate cylinder full, overcurrent detection, fill system fault, and end of cylinder life conditions.
2.5 **SHIP-LOOSE ACCESSORIES**

2.5.1 **Remote Sensors**
The unit shall be supplied with remote temperature and humidity sensors. The sensors shall be connected to the unit by a 30 ft. (9m) shielded cable.

2.5.2 **Condensate Pump**
The condensate pump shall have the capacity of _____ GPH (___ l/h) at ___ ft. head (___ kPa). It shall be complete with integral float switch, discharge check valve, pump, motor assembly and reservoir. A secondary float switch shall be provided to permit field wiring to the unit control to shut down the evaporator upon a high water level condition.

2.5.5 **Step-Down Transformer**
A step-down transformer shall be provided for [(Indoor Evaporator) (Close-Coupled Water/Glycol Condensing Unit) (Outdoor Air-Cooled Condensing Unit)] needing 277V input power voltage. The transformer shall be coated with epoxy and contained in an enclosed, non-ventilated electrical box with adaptable mounting brackets, suitable for [(indoor) (outdoor)] mounting.

2.5.6 **Liebert Local Monitoring Systems, Auto-changeover and Leak Detection**
Provide indicated quantities of the following:
- _____ Leak Detection System(s) Model __________________________________
- _____ Remote Monitor(s) Model ________________________________________
- _____ Auto-changeover Control(s) Model ________________________________

2.5.7 **Liebert iCOM CMS Monitoring and Control System**
A Liebert iCOM CMS Monitoring and Control System shall be provided for remote monitoring of the Liebert DataMate unit. The Liebert iCOM CMS shall have the capability to remotely monitor via mobile-device app and to monitor and change (at the user direction) the temperature and humidity setpoints and sensitivities of each unit via a firewall-protected web interface. The application shall provide the user with push-notifications of unit status and alarm information via SMS text or email messages. Single phase power (120 V) and field wiring to Liebert DataMate and world-wide web are required.

2.5.8 **Liebert® SiteScan® Site Monitoring System**
A Liebert SiteScan Site Monitoring System Model ________________ shall be provided for remote monitoring of the Liebert DataMate™ unit and monitoring of other Liebert support equipment. The Liebert SiteScan shall have the capability to monitor and change (at the user direction) the temperature and humidity setpoints and sensitivities of each unit. The printer shall provide the user with chronological alarm information. It shall also be capable of being programmed to print out environmental conditions or operating modes at each unit.

2.5.9 **Drycooler**
The Liebert drycooler shall be a low-profile, direct-drive propeller fan-type air-cooled unit. The drycooler shall be constructed with an aluminum cabinet and a copper-tube aluminum fin coil, and one or more direct drive fans. All electrical connections and controls shall be enclosed in an integral, NEMA 3R rated electrical panel section of the drycooler. The drycooler shall be quiet and corrosion resistant.

The drycooler shall be designed for _____°F (°C) ambient.

2.5.10 **Glycol Pump Package**
The system shall include a centrifugal pump mounted in a weatherproof and vented enclosure. The pump shall be rated for ___ gpm (l/s) at ___ ft. (kPa) of head, and operate on ____ volt, ____ phase, _____ Hz.
3.0 Execution

3.1 INSTALLATION OF AIR CONDITIONING UNITS

3.1.1 General
Install air conditioning units in accordance with manufacturer's installation instructions. Install unit plumb and level, firmly anchored in locations indicated and maintain manufacturer's recommended clearances.

3.1.2 Electrical Wiring
Install and connect electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's electrical connection diagram submittal to electrical contractor.

3.1.3 Piping Connections
Install and connect devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's piping connection diagram submittal to piping contractor.

3.1.4 Supply and Drain Water Piping
Connect water supply and drains to air conditioning unit. Provide pitch and trap as manufacturer's instructions and local codes require.

3.2 FIELD QUALITY CONTROL

Startup air conditioning units in accordance with manufacturer's start up instructions. Test controls and demonstrate compliance with requirements.