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LIEBERT PDX
AIR-COOLED SYSTEM

Job Name	VA TOGUS MAINE
Model	PX011UA1AD / MCS028E1AD
Quantity	1 / 1
Date	8/14/2023
Invoice #	
Purchaser	
P.O. #	
Tag #	
Submitted By	Matt Campbell

LIEBERT PDX
ENGINEERING SPECIFICATION SHEET
Air Cooled Systems

Project Name: VA TOGUS MAINE
Date: August 14, 2023
Reference No.: PRELIMINARY SUBMITTAL
Submitted By: MATTHEW CAMPBELL

Indoor Model Number: PX011UA1AD Qty: 1
Outdoor Model Number: MCS028E1AD Qty: 1

INDOOR UNIT ELECTRICAL SUPPLY REQUIREMENTS for 460 VAC:
- 460 Volt, 3 Phase, 60 Hertz, Short Circuit Current Rating (SCCR): 65,000 amps
- FLA: 18.8
- WSA: 22.7
- OPD: 25.0

INDOOR UNIT ELECTRICAL SUPPLY REQUIREMENTS for 208 VAC:
- 208 Volt, 3 Phase, 60 Hertz, Short Circuit Current Rating (SCCR): 65,000 amps
- FLA: 39.9
- WSA: 48.6
- OPD: 60.0

OUTDOOR UNIT ELECTRICAL SUPPLY REQUIREMENTS for 460 VAC:
- 460 Volt, 3 Phase, 60 Hertz, Short Circuit Current Rating (SCCR): 65,000 amps
- FLA: 1.4
- WSA: 1.8
- OPD: 15

OUTDOOR UNIT ELECTRICAL SUPPLY REQUIREMENTS for ~~460 VAC~~: 208
- 208/230 Volt, 3 Phase, 60 Hertz, Short Circuit Current Rating (SCCR): 65,000 amps
- FLA: 3.0
- WSA: 3.8
- OPD: 15

NET COOLING CAPACITY DATA
- 75 °F DB
- 45% RH
- Net Total Cooling Capacity: 44.2 KBTUH
- Net Sensible Cooling Capacity: 38.8 KBTUH

Air Flow Configuration:
- Up flow
- Front Air Return

Color:
- RAL 7021, Black Gray Matte

Cooling System Type:
- Air-Cooled

Refrigerant and Circuits:
- R-410A Refrigerant, Field Supplied
- Single Refrigerant Circuit

Compressor:
- Digital Scroll
- Thermal Expansion Valve
- Crankcase Heater

Fan And Motor:
- EC Fan
- Fan Motor HP: 1.28
- Air Volume: 1,800 CFM
- External Static Pressure: 0.2 Inches of Water

Electric Reheat:
- 2-Stage Electric Reheat, 20.4 KBTUH (6 kW)

Humidifier:
- Infrared Humidifier
- Capacity: 7.7 lb/h (3.5 kg/h)

Filter:
- Filter Rating: MERV 8 per ASHRAE 52.2-2007
- Filter Clog Alarm

Control, Sensors, and Monitoring:
- Liebert iCOM Control with High-Definition Display
    - Integrated Controls and High-Definition Color User Interface
    - Display Language is English
    - Audible and Visual Alarms
- iCOM based communication
    - Base Comms & Connectivity includes one Ethernet port and one RS-485 port on iCOM controller, dedicated to supporting BACnet IP, Modbus TCP/IP, BACnet 485, Modbus 485 and SNMP v1/v2c/v3
- Supply Air Sensor
- Internal Temperature/Humidity Sensors for return air sensing.
- Common Alarm Contact

Optional Equipment:
- Dual-float condensate pump
- One Remote Shut Down Contact

- Three Alarm Contacts
- Smoke Sensor
- LT410 Point Leak-Detection Sensor, quantity 1 per unit

Plenum:

- 18” Grilled Discharge Plenum, with (2) grilles per plenum.

Condensate Pump:
The dual-float condensate pump is complete with integral primary and secondary float switches, pump, motor assembly and reservoir. The secondary float sends a signal to the local alarm and shut down the unit upon high water condition. Condensate pump is factory-mounted internal to the unit.

Locking Disconnect Switch:
A manual fused disconnect switch is mounted in the electrical panel and be capable of disrupting the flow of power to the unit operation from the outside of the unit. The electric panel compartment is accessible only with the switch in the Off position. The electric panel is conveniently located behind the Liebert iCOM™ display door for quick access. Main fuses are located within disconnect.

Short Circuit Current Rating (SCCR):
All 60 Hz units are manufactured with components necessary to provide a 65,000 Amp RMS Short Circuit Current Rating for the entire unit.

Cabinet Description:
The exterior panels are 20-gauge galvanized steel and powder coated with RAL 7021 Black Gray Matte color paint to protect against corrosion. The exterior panels are insulated with 1/2" to 1" (12.7 to 25.4mm) 1-1/2 lb (0.68 kg) insulation. Front and side panels are captive, 1/4 turn fasteners. The cabinet is designed so that all components are serviceable and removable using the front and right sides of the unit. The front door can be opened for service without shutting off the system.

System Type:
Air-Cooled
Single refrigeration circuit including a liquid line filter drier, a refrigerant sight glass with moisture indicator, an externally equalized expansion valve, pressure safety switches, and a liquid line solenoid valve.

Refrigerant:
The system is designed for use with R410A refrigerant, which meets the U.S. Clean Air Act for phaseout of HCFC refrigerants.

Compressor:
Digital Scroll
The compressor is scroll-type with variable capacity operation from 20-100%, commonly known as a Digital Scroll. The compressor solenoid valve will unload the compressor to provide variable capacity operation. The controller engages and disengages the compressor on a 15 second control cycle. Includes a suction gas cooled motor, vibration isolators, internal thermal overloads, automatic reset high pressure switch, rotalock service valves, low pressure transducer, Crankcase heater, internal centrifugal oil pump and an operating speed of 3500 RPM at 60Hz. The Crankcase heater and a discharge check valve is provided for additional system protection from refrigerant migration during Off cycles.

Coil Description:
The direct expansion tilted-slab cooling coil is constructed of copper tubes and hydrophilic coated aluminum fins. The hydrophilic coating significantly improves the speed of condensate drainage from the fins and provides superior water carryover resistance. One stainless steel condensate drain pan is provided.

Fan and Motor:
EC Fan
The unit is equipped with one plug fan: direct driven with backward curved blades and Electronically Commutated DC motor; commonly referred to as EC plug fan. The fan speed is variable and automatically regulated by the Liebert iCOM™ control through all modes of operation. The fan has a dedicated motor, fault monitoring circuitry and speed controller which provides a level of redundancy. Impeller is made of aluminum and factory balanced. This design uses less energy than standard centrifugal blowers by lowering motor kW. The EC Plug Fan uses 10-30% less energy on average than standard AC motor. The EC Plug Fan is located within the unit.

Air Flow Configuration:
Up flow with Front Air Return. The supply air exits from the top of the unit. The return air enters through the front of the unit.

Filter:
Filter Rating: MERV 8 per ASHRAE 52.2
Includes a Filter Clog Alarm

Liebert iCOM:
The Liebert iCOM unit control is factory-set for Intelligent Control which uses 'fuzzy logic' and 'expert systems' methods. Proportional and Tunable PID are user selectable options. Internal unit component control includes the following: System Auto Restart, Sequential Load Activation, Hot Water Flush Cycles (if hot water coil is present), and Predictive Humidity Control. The control system and electronic circuitry is provided with self-diagnostics to aid in troubleshooting. The microcontroller board is diagnosed and reported as pass/not pass. Control inputs are indicated as on or off at the front monitor panel. Control outputs are able to be turned On or Off from the front monitor panel without using jumpers or a service terminal.

The display and housing are viewable while the unit panels are open or closed. The display is organized into three main sections: User Menus, Service Menus and Advanced Menus. The system displays user menus for: active alarms, event log, graphic data, unit view/status overview (including the monitoring of room conditions, operational status in % of each function, date and time), total run hours, various sensors, display setup, and service contacts. A password is required to make system changes within the service or advanced menus.

The Liebert iCOM control can activate an audible and visual alarm in event of any of the following conditions: High/Low Temperature, High/Low Humidity, Change Filters, Loss of Air Flow or Power, and four separate Custom Alarms.

Unit-to-Unit communication with another Liebert PDX/PCW unit included as standard using a private ethernet network between iCOM controllers. Optional network switch required for unit-to-unit communication between three or more PDX/PCW.

iCOM – High-Definition Color Display:
The standard user interface is the 7” High-Definition Color Display which presents system information and allows all parameters to be viewed and adjusted. It features a capacitive touchscreen for navigation ease and LED color indicating operational status.

Supply Air Sensor:
A factory installed and commissioned supply air sensor ships with the unit for sensor location in the field by others. The sensor is terminated on the Liebert iCOM unit controller terminal strip and the associated cable wiring is coiled within the unit for shipment. It is the responsibility of others to uncoil and locate the sensor in accordance with acceptable best practices and any local codes.

Temperature & Humidity Sensors:
Internal Temperature/Humidity Sensors
Factory installed, and commissioned return air temperature/humidity sensors are mounted inside the unit and are factory wired to the Liebert iCOM unit controller. Sensors are used for unit control and monitoring.

Common Alarm Contact:
The common alarm contacts provide the customer with a set of normally open contacts for remote indication of unit alarms.

Base-Comms for BMS Connectivity:
The Liebert iCOM controller provides one Ethernet Port and one RS-485 Port dedicated for BMS Connectivity. Provides ground fault isolated RS-485 Modbus, BACnet IP & Modbus IP network connectivity to Building Management Systems for unit monitoring and management. Also, provides ground fault isolated 10/100 baseT Ethernet connectivity for unit monitoring and management. The supported management interfaces include SNMP for Network Management Systems, HTTP for web page viewing, SMTP for email, and SMS for mobile messaging. The iCOM controller can support dual IP on one network and one 485 protocol simultaneously.

Smoke Sensor:
The smoke sensor samples the return air, shuts down the unit upon activation and sends visual and audible alarms. Dry contacts are available for a remote customer alarm. This smoke sensor is not intended to function as or replace any room smoke detection system that may be required by local or national codes.

Liebert Liqui-Tect® 410 Point Leak Detection Sensor:
The solid-state water sensor has no moving parts and is hermetically sealed to keep out dust and dirt. The Liebert Liqui-tect 410 (LT410) provides a single-point detection of leaks. The point detection sensor has two gold-plated sensing probes to prevent corrosion resistance and to provide accurate readings. The LT410 constantly monitors points for leaks, internal faults and power failures and warn of any abnormal conditions. Mounting brackets allow for sensor height adjustment and leveling. The LT410 provides two independent outputs to signal both a local alarm panel and a remote building management system or external equipment. Ships loose for field installation.

Liebert MC Condenser Detailed Description:

Standard Features:
- Microchannel aluminum coil(s)
- Integrated fan motor/blade/guard assembly
- Electronic control of fan speed
- Fused, locking and lockable electrical disconnect switch
- Variable fan speed motor
- Short Circuit Current Rating of 65,000 Amps, rms
- Factory wired and mounted NEMA 3R box containing main electrical panel.

Cabinet:
- Bright aluminum exterior panels
- Bright aluminum NEMA 3R box containing electrical panel
- Bright aluminum 36” legs

Control/Communication/Fan:
- Variable speed EC fan
- Premium electronic control & communication board
- CANbus connection terminals for communication with iCOM

Refrigerant & Circuits:
- R-410A set points
- Single refrigerant circuit

Optional Features:
- E-Coated Coils with UV Topcoat

VERTIV. Liebert Rating System (LRS) 3.6.0.10w 4.4.3.18e

Project Name:	**TOGUS MAINE VA**	Office Name:	**Vertiv, Seattle Office**
Customer Name:		Phone Number:	**+1 206 763 5000**
Sales Rep. Name:	**MATTHEW CAMPBELL**		

PDX Model PX011UA1*D~MCS028E1; Air Cooled

Manufacturer:	**Liebert North America**	Altitude:	**0 ft**
Unit Power Supply:	**460/3/60**	ESP:	**0.20 InH2O**
Refrigerant:	**R410A**	Width:	**34.5 in**
Internal Filter Class:	**Merv 8 Std. - 2 inch (51 mm)**	Depth:	**32.3 in**
Spec.sheet output date:	**30-Jun-23**	Height:	**77.6 in**
Return Airflow (std. motor):	**1800 ACFM**	Weight:	**600 lb**

Condenser(s)

Manufacturer:	**Liebert North America**
Model:	**MCS028E1**
Condenser Type:	**MCH Condenser**
Design Ambient:	**105 °F**
Power Option:	**460/3/60**

Compressor(s)

Manufacturer:	**Copeland**
Model:	**ZPD42K5E-60Hz**
Compressor Type:	**Digital**
Power Supply:	**460/3/60**

Evaporator(s)

Manufacturer:	**Liebert North America**
Model:	**RTPX011UEvapx1**
Fin Type:	**Lanced**
Number of Rows:	**3**
Fin Density:	**12 fpi**
Face Area:	**9.46 ft²**
Surface Area:	**540 ft²**

Miscellaneous

Humidifier Type:	**Infrared**
Model:	**IR_7.7lb_4.8kW**
Bypass airflow:	**0 %**

Cooling Fan(s)

Model:	**EC-355**
Description:	**U - DX Cooling Only**
Air Supply:	**Top**
Power Supply:	**460/3/60**
Quantity of Motors:	**1**

System: [Digital Loading: 100%, SC: 10 °F, SH: 12 °F] [ESP:0.2]

Ent DB (°F)	Ent WB (°F)	Ent RH (%)	Ent DP (°F)	Return Air Vol (ACFM)	Supply Air Vol (ACFM)	Air Face Vel (ft/min)	Unit Air Vol (SCFM)	Amb DB (°F)	NTCC (kBtu/hr)	NSCC (kBtu/hr)	THR (kBtu/hr)	Cond. Airflow (ACFM)	Lvg DB (°F)	Lvg WB (°F)	Tot Comp Pwr (kW)	Sys Power Input (kW)	Sys SCOP (W/W)	Sys NSenCOP (W/W)	Fan kW (kW)	Airflow Calibration (V)
75	61.1	45	52.3	1800	1730	191	1758	95	44.2	38.8	57	4649	54.9	52.2	3.11	4.27	2.67	2.67	0.52	8.07

System

Compressor Power (kW)	Sat. Discharge Temp. (°F)	Sat. Suction Temp. (°F)
3.11	111.2	45.1

Notes

1. Capacities shown have been reduced by fan motor(s) heat (net).
2. System Power Input includes Compressor(s), Blower Motor(s), Condenser(s), and Control Power.
3. Coil airflow has not been reduced by a bypass.
4. Capacity Tolerance is 5%.
5. ACFM/ACMH is the unit actual air flow rate when measured at the specific return or supply temperature and barometric conditions that define a unique air density.
6. SCFM/SCMH is the unit air flow rate when converted to standard air density of 0.075 lb/ft3 at sea level.
7. NTCC, Net Total Cooling Capacity
8. NSCC, Net Sensible Cooling Capacity

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Certified in accordance with the AHRI Datacom Cooling Certification Program at AHRI Standard 1360 (I-P) and ASHRAE Standard 127-2007 Standard Rating Conditions. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

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VERTIV. Liebert Rating System (LRS) 3.6.0.10w 4.4.3.18e

Project Name:	**VA TOGUS**	Office Name:	**Vertiv, Seattle Office**
Customer Name:		Phone Number:	**+1 206 763 5000**
Sales Rep. Name:	**MATTHEW CAMPBELL**		

PDX Model PX011UA1*D~MCS028E1; Air Cooled

Manufacturer:	**Liebert North America**	Altitude:	**0 ft**
Unit Power Supply:	**208/3/60**	ESP:	**0.20 InH2O**
Refrigerant:	**R410A**	Width:	**34.5 in**
Internal Filter Class:	**Merv 8 Std. - 2 inch (51 mm)**	Depth:	**32.3 in**
Spec.sheet output date:	**03-Apr-23**	Height:	**77.6 in**
Return Airflow (std. motor):	**1800 ACFM**	Weight:	**600 lb**

Condenser(s)

Manufacturer:	**Liebert North America**
Model:	**MCS028E1**
Condenser Type:	**MCH Condenser**
Design Ambient:	**105 °F**
Power Option:	**208-230/3/60**

Compressor(s)

Manufacturer:	**Copeland**
Model:	**ZPD42K5E-60Hz**
Compressor Type:	**Digital**
Power Supply:	**208/3/60**

Evaporator(s)

Manufacturer:	**Liebert North America**
Model:	**RTPX011UEvapx1**
Fin Type:	**Lanced**
Number of Rows:	**3**
Fin Density:	**12 fpi**
Face Area:	**9.46 ft²**
Surface Area:	**540 ft²**

Miscellaneous

Humidifier Type:	**No Humidifier**
Bypass airflow:	**0 %**

Cooling Fan(s)

Model:	**EC-355**
Description:	**U - DX Cooling Only**
Air Supply:	**Top**
Power Supply:	**208/3/60**
Quantity of Motors:	**1**

System: [Digital Loading: 100%, SC: 10 °F, SH: 12 °F] [ESP:0.2]

Ent DB (°F)	Ent WB (°F)	Ent RH (%)	Ent DP (°F)	Return Air Vol (ACFM)	Supply Air Vol (ACFM)	Air Face Vel (ft/min)	Unit Air Vol (SCFM)	Amb DB (°F)	NTCC (kBtu/hr)	NSCC (kBtu/hr)	THR (kBtu/hr)	Cond. Airflow (ACFM)	Lvg DB (°F)	Lvg WB (°F)	Tot Comp Pwr (kW)	Sys Power Input (kW)	Sys SCOP (W/W)	Sys NSenCOP (W/W)	Fan kW (kW)	Airflow Calibration (V)
75	61.1	45	52.3	1800	1730	191	1758	95	44.2	38.8	57	4649	54.9	52.2	3.11	4.27	2.67	2.67	0.52	8.07

System

Compressor Power (kW)	Sat. Discharge Temp. (°F)	Sat. Suction Temp. (°F)
3.11	111.2	45.1

Notes

1. Capacities shown have been reduced by fan motor(s) heat (net).
2. System Power Input includes Compressor(s), Blower Motor(s), Condenser(s), and Control Power.
3. Coil airflow has not been reduced by a bypass.
4. Capacity Tolerance is 5%.
5. ACFM/ACMH is the unit actual air flow rate when measured at the specific return or supply temperature and barometric conditions that define a unique air density.
6. SCFM/SCMH is the unit air flow rate when converted to standard air density of 0.075 lb/ft3 at sea level.
7. NTCC, Net Total Cooling Capacity
8. NSCC, Net Sensible Cooling Capacity

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Datacom Cooling
AHRI Standard 1360

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LIEBERT PDX

STANDARD FEATURES
AIR COOLED

DX COOLING COIL The evaporator coil is constructed of copper tubes and hydrophilic coated aluminum fins. A stainless steel condensate drain pan is provided.

REFRIGERATION SYSTEM Single refrigeration circuit shall include a liquid line filter drier, a refrigerant sight glass with moisture indicator, an expansion valve, pressure safety switch, and a liquid line solenoid valve.

DIGITAL SCROLL COMPRESSOR The compressor is an R-410A scroll-type with variable capacity operation from 20-100%. Compressor solenoid valve unloads the compressor to provide variable capacity operation. The compressor has a suction gas cooled motor, EPDM vibration isolators, internal thermal overloads, automatic reset high pressure switch with lockout after three failure occurrences, RotoLock service valves, low pressure transducer and crankcase heater.

ELECTRONICALLY COMMUTATED (EC) FAN is plug type, integral direct driven fan with backward curved blades and Electronically Commutated DC motor; commonly referred to as an EC fan. The fan speed shall be variable and automatically regulated by the Liebert iCOM® control through all modes of operation. The impeller shall be made of aluminum and dynamically balanced. The fan shall be located to draw air through the coil to ensure even air distribution and maximum coil performance.

CABINET The exterior panels are 20 gauge steel and powder coated with RAL7021 black gray matte color paint to protect against corrosion. Exterior panels are insulated with ½" (sides) or 1"(front and rear), 1-1/2 lb insulation. Front and side panels have captive, 1/4 turn fasteners to allow quick panel removal. The cabinet is designed so that all components are serviceable and removable using the front and right sides of the unit.

FILTER - The filter shall be deep-pleated, 2 in (51mm) thick with a MERV8 rating efficiency based on ASHRAE 52.2-2007.

LIEBERT iCOM CONTROL SYSTEM The Liebert PDX is controlled by the iCOM Control System. A 7-inch, high definition, capacitive, color touchscreen presents system information and allows parameters to be viewed and adjusted. The controls shall be menu driven and shall display user menus for active alarms, event log, graphic data, unit view/status overview (including the monitoring of room conditions, operational status in percentage of each function, date and time), total run hours, various sensors, display setup and service contacts. It features a 3-level password protection system. Unit–to-Unit communication capability with other Liebert PDX units is included as standard.

BASE-COMMS FOR BMS CONNECTIVITY The Liebert iCOM controller provides one Ethernet Port and one RS-485 Port dedicated for BMS connectivity. Provides ground fault isolated RS-485 Modbus, BACnet IP & Modbus IP network connectivity to Building Management Systems for unit monitoring and management. Also, provides ground fault isolated 10/100 baseT Ethernet connectivity for unit monitoring and management. The supported management interfaces include: SNMP v1/v2c/v3 for Network Management Systems, HTTP for web page viewing, SMTP for e-mail, and SMS for mobile messaging. The iCOM controller can support dual IP on one network and one 485 protocol simultaneously.

UNIT DISCONNECT SWITCH A "Locking-Type" fused disconnect switch is available. The "Locking-Type" consists of a main unit switch operational from the outside of the unit. Access to the high voltage electric panel can be obtained only with the switch in the "off" position. The disconnect has main fuses within the disconnect.

65,000 AMP SHORT CIRCUIT CURRENT RATING (SCCR) The 60Hz electrical panel provides 65kA SCCR.

REMOTE SHUTDOWN TERMINAL The remote shutdown terminal shall provide the customer with a location to remotely shut down the unit, complying with the National Fire Code.

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LIEBERT PDX

STANDARD FEATURES
AIR COOLED

COMMON ALARM CONTACT The common alarm contacts shall provide the customer with a set of normally open contacts for remote indication of unit alarms. Four alarm contacts shall be provided for units without a condensate pump. Three alarm contacts shall be provided for units with a condensate pump.

SUPPLY AIR SENSOR The supply air temperature sensor shall provide real-time, direct feedback to the downflow raised floor cooling unit to provide a consistent supply air temperature by adjusting the compressor capacity or the chilled water valve accordingly to maintain set point. The supply air temperature sensor will provide real-time, monitoring of discharge air temperature on all other units.

INFRARED HUMIDIFIER High intensity infrared quartz lamps over a stainless steel humidifier pan. An automatic water supply system maintains water level in the pan and a timed flush system greatly reduces mineral precipitation, and is field adjustable to change the cycle time. A 1" (25mm) air-gap within the water supply piping assembly shall prevent backflow of the humidifier supply water.

ELECTRIC REHEAT Electric low watt density 304/304 stainless steel fin tubular electric reheat elements provide reheat to control room dry bulb temperature.

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LIEBERT PDX

OPTIONAL FEATURES
AIR COOLED

(Refer to specification sheet for options supplied)

STEAM GENERATING HUMIDIFIER is factory-installed in the cooling unit and is operated by the Liebert iCOM control system. It is complete with disposable cylinder, all supply and drain valves, steam distributor and electronic controls. The need to change the canister is indicated on the Liebert iCOM display. The humidifier is designed to operate with water conductivity from 330-670 (60Hz) microS/cm. System automatically fills and drains as well as maintains the required water level based on conductivity. A 1" (25mm) air-gap within the humidifier assembly shall prevent backflow of the humidifier supply water.

SCR REHEAT is a 6kw electric reheat element controlled by a variable output Silicon Controlled Rectifier (SCR) control. The SCR reheat option provides precise temperature control. PX011 models only.

DUAL-FLOAT CONDENSATE PUMP has a capacity of 5 GPM (18.9 l/min) at 40ft (12.2 m) head. Pump is complete with integral primary and secondary float switches, pump, motor assembly and reservoir. The secondary float shall send a signal to the local alarm and shut down the unit upon high water condition. The condensate pump shall be factory-installed on upflow units and field-installed on downflow units.

DIGITAL SCROLL COMPRESSOR SOUND JACKET The compressor sound jacket shall reduce the level of sound emitted from the compressor. It shall consist of a 3/8 inch closed cell polymeric 4.5 - 8.5 lb/ft^3 density jacket that encloses the compressor.

STANDARD SCROLL COMPRESSOR The compressor is an R-410A scroll-type with a suction gas-cooled motor, EPDM vibration isolators, internal thermal overloads, automatic reset high pressure switch with lockout after three failures, Rotolock service valves, and low pressure transducer. The crankcase heater and a discharge check valve shall be provided for additional system protection from refrigerant migration during off cycles.

DUAL COOL consists of an additional free-cooling chilled water/glycol coil and is constructed of copper tubes and hydrophilic coated aluminum fins. A 2-way or 3-way modulating valve controls the chilled water flow passing through the cooling coil. The free cooling coil is strategically located in the return air stream of an air-cooled unit to either precool or totally cool the air before entering the refrigeration coil. Liebert iCOM controls the activation/deactivation and modulation of the cooling sources allowing the system to function as a modulating chilled water/glycol system, as a compressorized system, or combination of both. Standard pressure rating is 150 psig (1034 kPa). Optional pressure rating is 400 psig (2758 kPa). This is a 4-pipe system.

ELECTRONIC EXPANSION VALVE shall be of stepper-motor type. The EEV shall maintain consistent superheat of the refrigerant vapor at the outlet of the evaporator coil over the unit's operating range. The valve shall be controlled by a separate electronic controller. Superheat shall be determined through the suction pressure-temperature method.

FILTER - The filter shall be deep-pleated, 2 in (51mm) thick with a MERV11 rating efficiency based on ASHRAE 52.2-2007.

DOUBLE SKIN PANELS The exterior panels shall be internally lined with 20 gauge galvanized steel, sandwiching the insulation between the panels for easy cleaning.

SMOKE SENSOR - The Smoke Sensor samples the return air and shuts down the unit upon activation and sends visual and audible alarms. Dry contacts are available for a remote customer alarm. This smoke sensor is not intended to function as or replace any room smoke detection system that may be required by local or national codes.

OPTIONAL FEATURES
AIR COOLED

HIGH TEMPERATURE SENSOR - The High Temperature Sensor is mounted in the electric panel with the sensing element in the return air flow. The high temperature sensor shall immediately shut down the system when high temperatures are detected.

COMPRESSOR OVERLOAD SENSOR A pair of N/O contacts shall be factory-installed and wired to each compressor to indicate Compressor Overload.

REMOTE TEMPERATURE AND HUMIDITY SENSORS Are provided in a vented case for mounting in the room to be conditioned. Includes 30 ft. (9m), 60 ft. (18m), 90 ft. (27m), 120 ft. (36m), or 150 ft. (45m) of cable supplied for connecting sensors to unit.

REHEAT/ HUMIDIFIER LOCKOUT – The option includes the relays necessary to disable the reheat and humidifier from an external customer supplied 24 Volt AC signal while on emergency power.

LOW VOLTAGE TERMINAL PACKAGE One (1) extra N/O common alarm contacts shall be provided. Two (2) extra remote shutdown terminals shall be provided. One (1) pair of N/O contacts shall be factory-installed and wired to indicate Main Fan Overload. One (1) pair of N/O contacts shall be provided for Liqui-tect signal shut down. (Liqui-tect not included).

REMOTE HUMIDITY CONTACT allows the unit's humidity controller to control a humidifier outside the unit. Power to operate the remote humidifier does not come from the Liebert PDX unit.

FLOOR STAND Is constructed of galvanized steel and available in heights from 6" to 24" (150mm to 610mm) with vibration isolation pads provided on the adjustable legs.

RETURN AIR FLOOR STAND ASSEMBLY The upflow unit with rear return air configuration shall be supplied with a skirted-floor stand assembly. The floor stand assembly shall be constructed of galvanized steel with powder coated panels and supplied with air filter. The floor stand assembly shall be 24-1/8 in (613mm) high and have adjustable legs with vibration isolation pads. It provides a rear return duct flange and removable panel for filter access.

UPFLOW UNIT PLENUM(S) are available in various configurations for upflow units: ducted air discharge with solid panels or 2 way, 3 way, or 4 way air discharge with grilles. Each plenum is constructed of 20 gauge steel with 1" (25.4mm), 1 1/2 lb. (.68kg) insulation and is powder-coated with RAL7021 black gray matte color paint to protect against corrosion. The ducted air discharge plenum is available in 18 in. (457mm), 24 in. (610mm), 30 in. (762mm), 36 in. (914mm), 42 in. (1067mm), or 48 in. (1219mm), and the air discharge with grilles plenum is 18 in. (457mm) high.

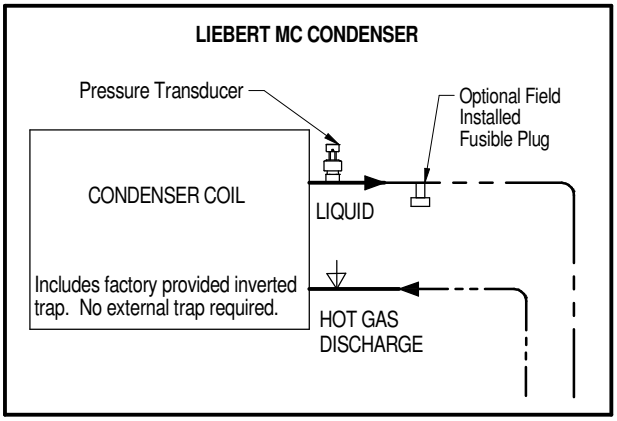
DOWNFLOW UNIT PLENUM(S) are available in various heights. Each plenum is constructed of 20 gauge steel with 1" (25mm), 1-1/2lb (0.68kg) insulation and is powder-coated with RAL7021 black gray matte color paint to protect against corrosion. The ducted air return plenum is available in 18" (457mm), 24" (610mm), 30" (762mm), 36" (914mm), 42" (1067mm), or 48" (1219mm).

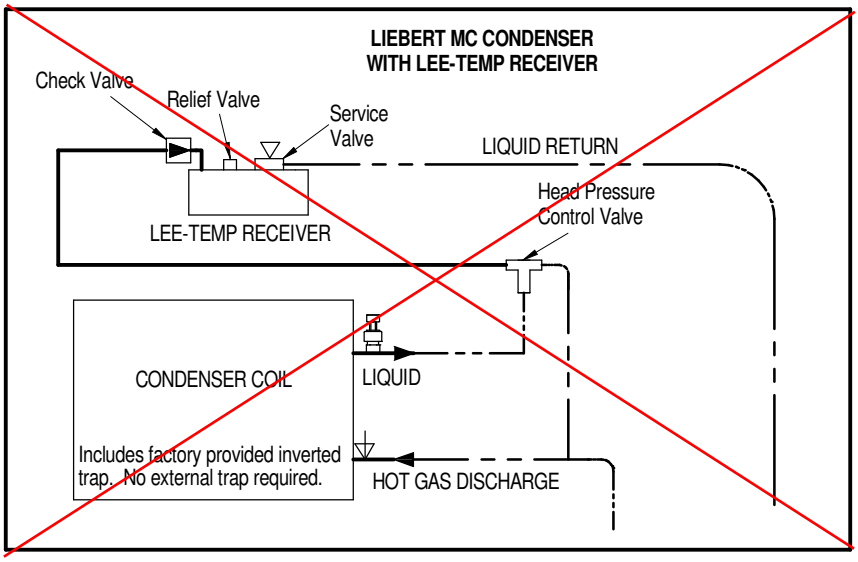
LIQUI-TECT SENSOR - The water sensor is a hermetically sealed solid state device with no moving parts. When the sensor detects the presence of moisture, the alarm system is activated.

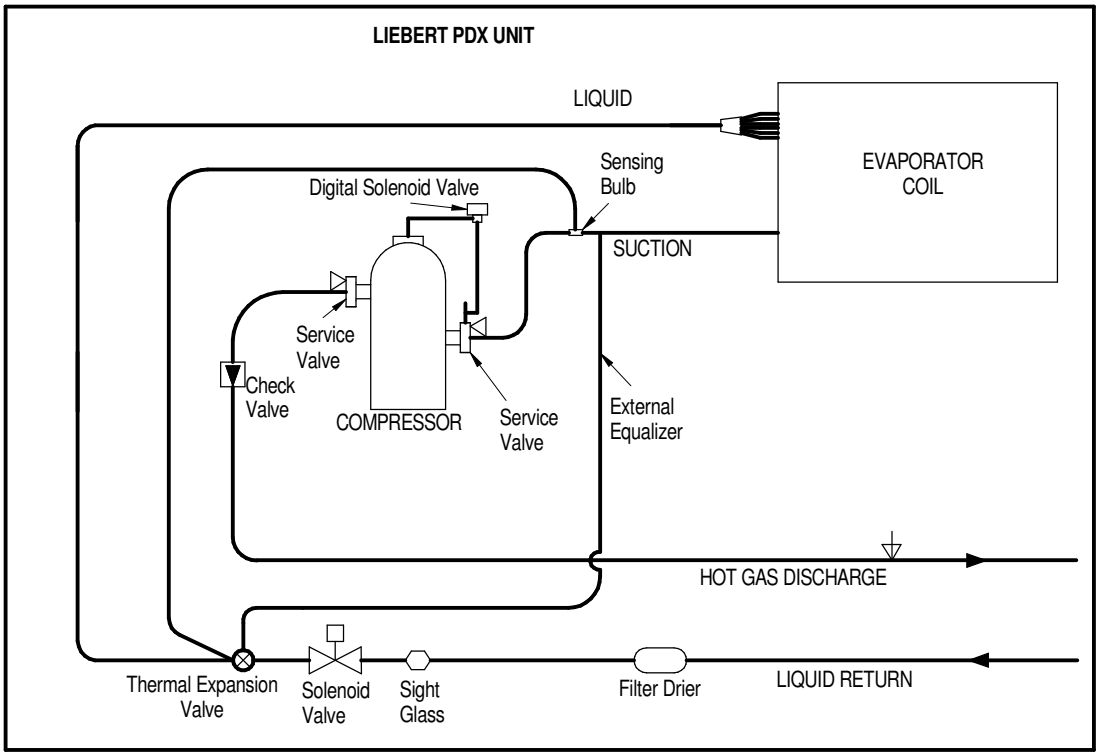
VERTIV.

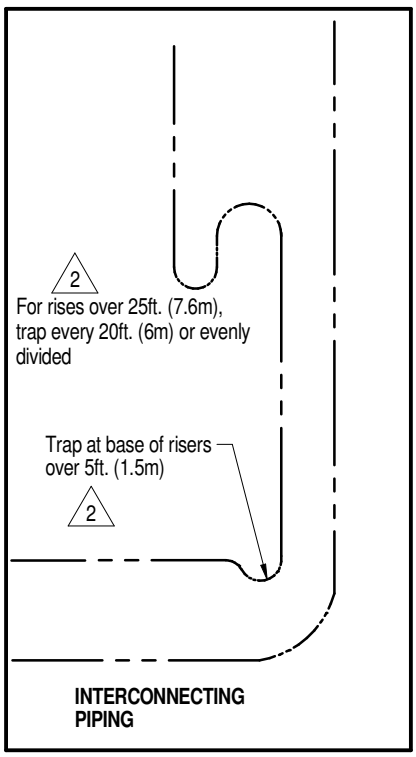
LIEBERT PDX

PIPING SCHEMATIC
AIR COOLED MODELS WITH TXV









FACTORY REFRIGERANT PIPING

FIELD PIPING

SERVICE / SCHRADER (ACCESS) CONNECTION NO VALVE CORE

SERVICE / SCHRADER (ACCESS) CONNECTION WITH VALVE CORE

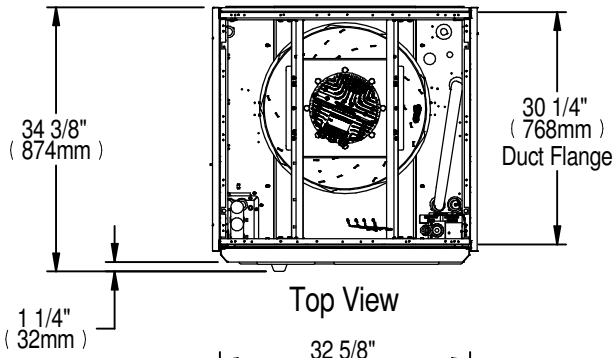
Notes:

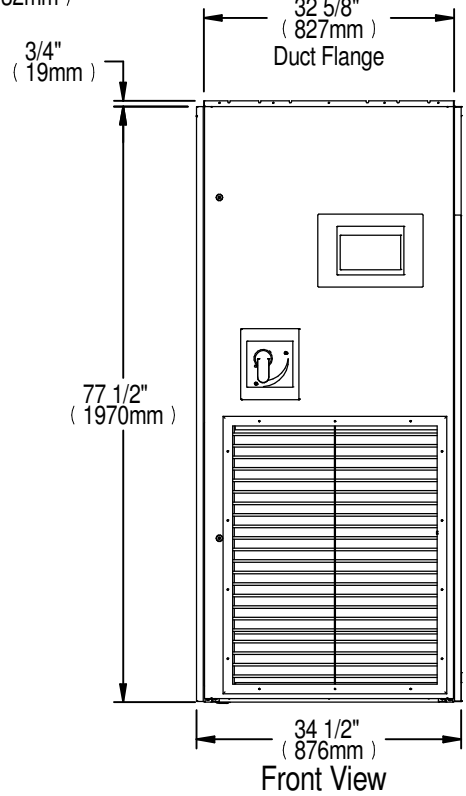
1. Schematic representation shown. Do not use for specific connection locations.
2. Components are not supplied by Liebert but are required for proper circuit operation and maintenance.
3. Traps must be installed and horizontal lines pitched to ensure proper oil return and to reduce liquid floodback to compressor. Pitch horizontal hot gas piping at a minimum of 1/2" per 10 feet (42mm per 10m) so that gravity will aid in moving oil in the direction of the refrigeration flow.
4. Do not isolate any refrigerant circuits from over pressurization protection.

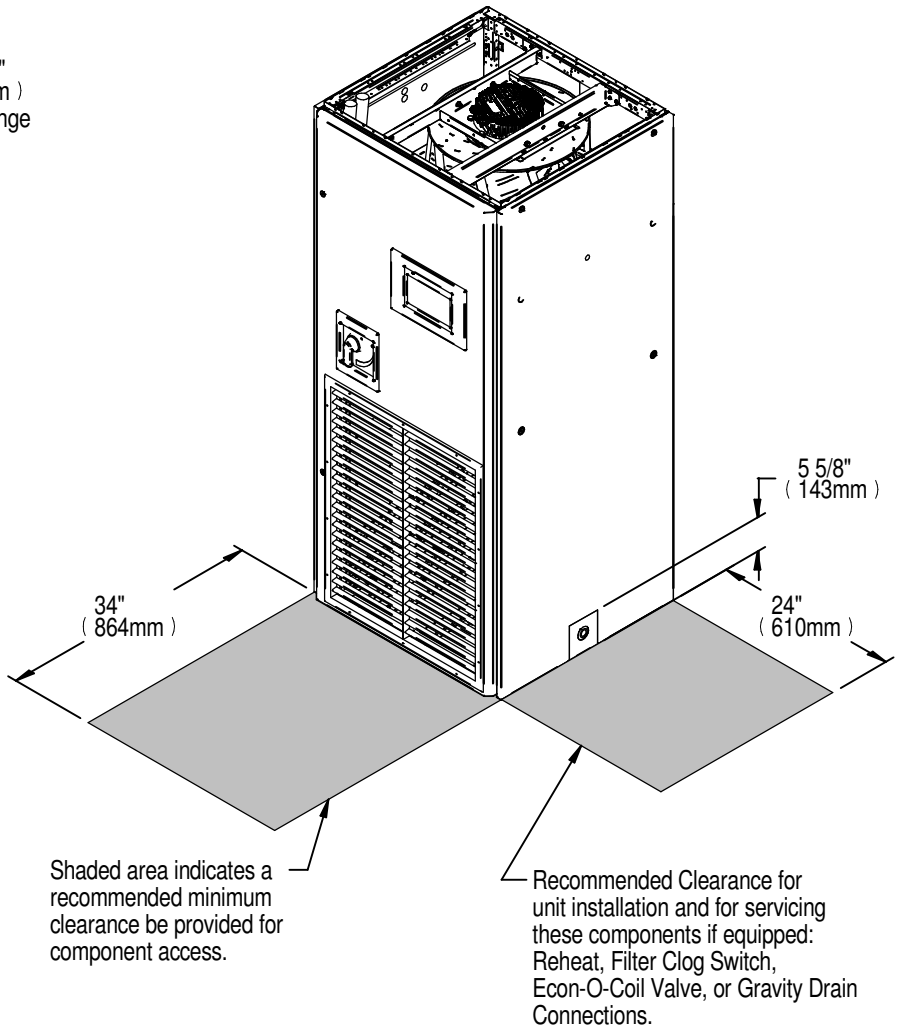
VERTIV.

LIEBERT PDX & PCW

CABINET DIMENSIONAL DATA
UPFLOW MODELS







DRY WEIGHT lb (kg) APPROXIMATE			
Liebert PDX Model No.	**PX011**	~~**PX018-023**~~	~~**PX029**~~
Air Cooled	600 (272)	~~670 (304)~~	~~700 (317)~~
~~Air Cooled w/dual cool~~	~~700 (317)~~	~~750 (340)~~	~~790 (358)~~
~~Water/Glycol~~	~~620 (281)~~	~~690 (313)~~	~~720 (327)~~
~~GLYCOOL™ or Water/Glycol w/dual cool~~	~~720 (327)~~	~~770 (349)~~	~~810 (367)~~
~~**Liebert PCW Model No.**~~	~~**PW011**~~	~~**PW017**~~	~~**PW029**~~
~~Chilled Water~~	~~575 (260)~~	~~600 (272)~~	~~650 (294)~~

Note: Unit with front return shown. Bottom return with rear return floorstand is also available (24" height rear return floorstand is required for use with bottom return unit).

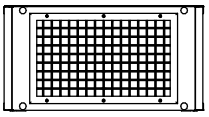
VERTIV.

LIEBERT PDX & PCW

PLENUM DIMENSIONAL DATA
UPFLOW DISCHARGE GRILLE

FRONT VIEWS - CHECK ONE (1):

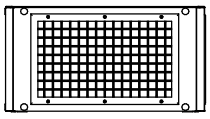
☐ WITH GRILLE



☐ WITHOUT GRILLE

REAR VIEWS - CHECK ONE (1):

☐ WITH GRILLE



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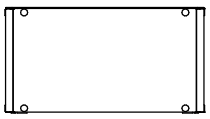
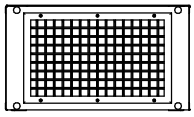
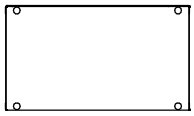


LEFT SIDE VIEWS - CHECK ONE (1):

☐ WITH GRILLE

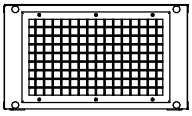


☐ WITHOUT GRILLE

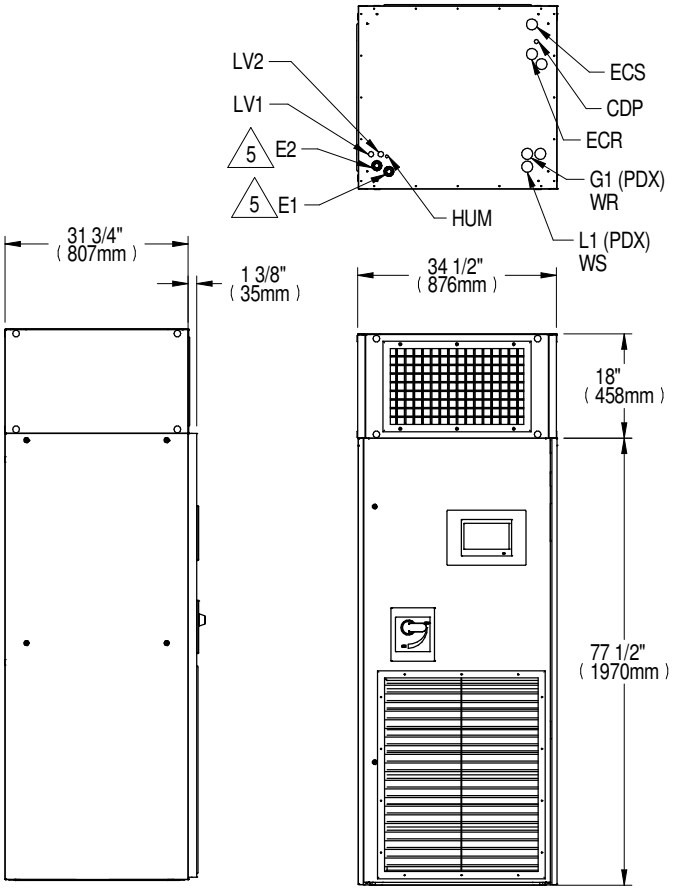


RIGHT SIDE VIEWS - CHECK ONE (1):

☐ WITH GRILLE



☐ WITHOUT GRILLE



SIDE VIEW - UNIT WITH PLENUM FRONT VIEW - UNIT WITH PLENUM

POINT	DESCRIPTION	X in. (mm)	Y in. (mm)	KNOCKOUT SIZE, in. (mm)
L1	LIQUID LINE SYSTEM 1	5-1/8 (130)	25-5/8 (651)	2 (51)
G1	HOT GAS DISCHARGE 1			
CDP	CONDENSATE DRAIN WITH PUMP	3-1/2 (89)	6-1/8 (155)	3/4 (19)
HUM	HUMIDIFIER SUPPLY LINE	29-1/2 (748)	26 (662)	1/2 (13)
~~WS~~	~~SUPPLY-CW/WATER/GLYCOL~~	~~5-1/8 (130)~~	~~25-5/8 (651)~~	~~2 (51)~~
~~WR~~	~~RETURN-CW/WATER/GLYCOL/GLYCOOL™~~			
~~ECS~~	~~ECON-O-COIL SUPPLY~~ 4 ~~/ GLYCOOL™ SUPPLY~~	~~4-1/4 (109)~~	~~3-1/8 (80)~~	
~~ECR~~	~~ECON-O-COIL RETURN~~ 4		~~8-1/4 (210)~~	
E1	ELECTRICAL CONN. (HIGH VOLT)	29-1/8 (739)	28-5/8 (728)	7/8 (23), 1-3/8 (35), 1-3/4 (44) 5
E2	ELECTRICAL CONN. (HIGH VOLT)	31-1/4 (793)	27-5/8 (702)	
LV1	ELECTRICAL CONN. (LOW VOLT)	32-1/4 (818)	25-5/8 (652)	1 (25)
LV2	ELECTRICAL CONN. (LOW VOLT)	30-1/2 (775)		

Notes:
1. Two grilles minimum per plenum required.
   The nominal grille size is 24" (609mm) x 14" (355mm).
2. All Plenums are shipped flat (non-assembled) and must be assembled on site.
3. Upflow bottom return units are available with required rear return floorstand with filter.

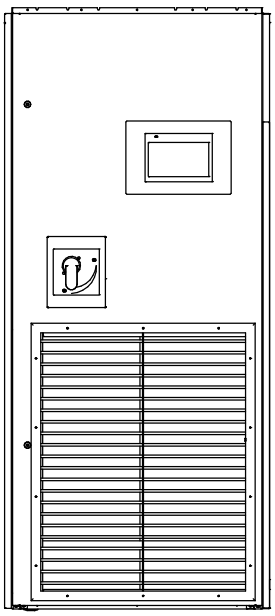
4. Units supplied with Dual Cooling systems only (4 pipe system).

5. Concentric knockouts to be used based on field supplied conduit diameter.

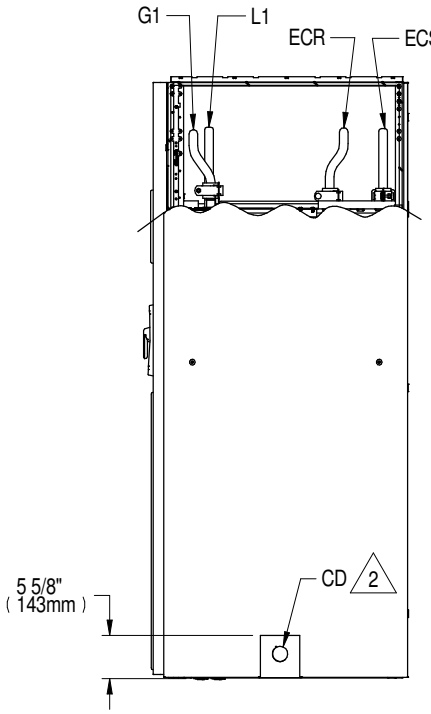
VERTIV.

LIEBERT PDX

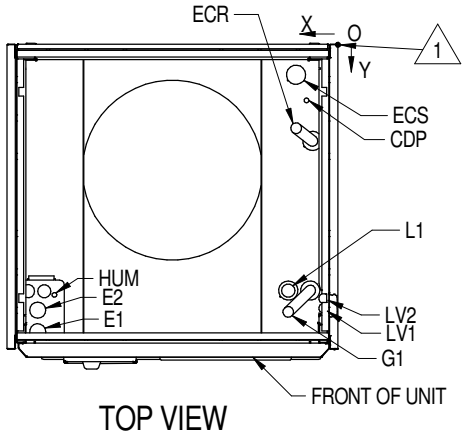
PRIMARY CONNECTION LOCATIONS
UPFLOW AIR COOLED MODELS



FRONT VIEW



RIGHT SIDE VIEW



TOP VIEW

POINT	DESCRIPTION	X in. (mm)	Y in. (mm)	Z in. (mm)	CONNECTION SIZE in.		
					PX011	PX018, PX023	PX029
L1	LIQUID LINE SYSTEM	5-1/8 (130)	25-5/8 (651)	N/A	3/8	1/2	5/8
G1	HOT GAS DISCHARGE		27-7/8 (708)		1/2	5/8	7/8
CD	CONDENSATE DRAIN 2	N/A	16-5/8 (422)	3-1/8 (89)	3/4 NPT FEMALE		
CDP	CONDENSATE DRAIN WITH PUMP	3-1/4 (83)	5-7/8 (149)	N/A	1/2		
HUM	HUMIDIFIER SUPPLY LINE	29-1/2 (749)	26 (660)		1/4		
~~ECS~~	~~ECON-O-COIL SUPPLY~~ 3	~~4-1/4 (108)~~	~~3-1/4 (83)~~		~~7/8~~	~~1-1/8~~	
~~ECR~~	~~ECON-O-COIL RETURN~~ 3		~~8-1/4(210)~~				
E1	ELECTRICAL CONN. (HIGH VOLT)	31-1/4 (794)	30 (762)		7/8, 1-3/8, 1-3/4 6		
E2	ELECTRICAL CONN. (HIGH VOLT)		27-3/4 (705)				
LV1	ELECTRICAL CONN. (LOW VOLT)	1-1/2 (38)	27-1/2 (699)		1		
LV2	ELECTRICAL CONN. (LOW VOLT)		26-1/2 (673)				

Notes:

1. Drawing not to scale. All dimensions from rear corner of unit including panels and have a tolerance of ± 1/2" (13mm).
2. Field pitch Condensate drain line a minimum of 1/8" (3mm) per 12" (305mm) All units contain a factory installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials The drain line must comply with local codes.
3. Supplied on Dual Cooling Systems only.
4. Unit with front return shown. Bottom return with rear return floorstand also available.
5. All refrigerant & water piping connections are O.D. Copper except as noted.
6. Concentric knockouts to be used based on field supplied conduit diameter.

ELECTRICAL FIELD CONNECTIONS
UPFLOW & DOWNFLOW MODELS

1. **High Voltage Entrance.** Supplied on top and bottom of electric box. Knockout size Ø1.75in (44.5mm).
2. **Low Voltage Entrance.** Ø1.375 in. (34.9mm) hole located on bottom of Electric Box.
3. **Three phase Electric Service and earth ground.** Field supplied.
4. **Three phase connection.** Electric service connection terminals on disconnect.
5. **Factory installed disconnect switch.** Fused disconnect switch provided on units.
6. **Earth ground connection.** Connection terminals for field supplied earth grounding wire.
7. **Earth ground bar.** Connection terminals with factory ground from each high voltage component for field supplied earth grounding wire.
8. **Control and monitoring section** of electric box.
9. **Remote unit shutdown.** Replace existing jumper between terminals 37 & 38 with normally closed switch having a minimum 75VA, 24VAC rating. Use field supplied Class 1 wiring. Two additional contact pairs available as an option (labeled as 37B & 38B, 37C & 38C). Replace existing jumper for appropriate pair as done for 37 & 38.
10. **Remote Alarm Device (RAD) Connections.** Alarm connections may be factory wired or field wired. See schematic, RAD1-4, for factory wired alarms. For field wired alarms, use Class 1 wiring to connect normally open contacts between terminals 24 & 50, 24 & 51, 24 & 55, or 24 & 56. Suitable for 24VAC.
11. **Smoke detector alarm connections.** Field supplied Class 1 wiring to 1 Amp, 24VAC maximum remote alarm circuits. Factory wired contacts from optional smoke detector are #91-Common, #92-NO, and #93-NC. Optional smoke detector trouble (SDT) connections #80 & # 81.
12. **Common alarm connection.** Field supplied Class 1 wiring to common alarm terminals 75 & 76 (and optional 94 & 95, and 96 & 97), which are factory connected to normally open contacts, 1 Amp, 24VAC maximum on common alarm relay (R3).
13. **Heat rejection connection.** Field supplied Class 1 wiring to heat rejection interlock terminals 70 & 71 which are factory connected to normally open compressor side switch (self contained units only) or to GLYCOOL relay K11 (GLYCOOL units only). On Dual Cool units only, connect auxilliary cooling source terminals 72 & 73 to relay K11. See indoor and outdoor electric schematic for more information.
14. ~~**Reheat and Humidifier Lockout.** Optional emergency power lockout of reheat and/or humidifier: Connections #82 & #83 are provided for remote 24VAC source and Class 1 wiring by others.~~
15. ~~**Main Fan Auxiliary Switch.** Optional main fan auxiliary side switch. Terminals located on customer connection terminal block for remote indication that the evaporator fan motor/unit is on. Field to connect 24V maximum, Class 1 wiring to connections #84 & #85.~~
16. **Optional Condensate Alarm (Dual Float Condensate Pump only).** Relay terminals located on customer connection terminal block for remote indication. Field supplied Class 1 wiring to connections #88 & #89.
17. **Optional Remote Liquitect Indicator.** Optional remote liquitect indicator for unit shutdown. Terminals located on customer connection terminal block. Field to connect 24V maximum, Class 1 wiring to connections #58 & #59.
18. ~~**Optional Analog Inputs #3 & #4.** Customer connection to terminals 41, 42, 43, 44 for analog inputs.~~
19. ~~**Spare Terminals for Optional Devices**. Customer connection when optional device is supplied. See unit schematic.~~

ELECTRICAL FIELD CONNECTIONS
UPFLOW & DOWNFLOW MODELS

20. CANbus Connector. Terminal block with terminals 49-1 (CAN-H) and 49-3 (CAN-L) + SH (shield connection). The terminals are used to connect the CANbus communication cable (provided by others) from the indoor unit to the Liebert MC Condenser.

21. CANbus Cable. CANbus cable provided by others to connect to the outdoor condenser and optional PRE unit. No special considerations are required when the total external cable connection between the indoor unit and outdoor unit(s) is less than 450FT (137M). For total external cable connections greater than 450FT (137M). For external cable connections greater than 450FT (137M), but less than 800FT (243M) a CANbus isolator is required (Contact Factory). Cable must have the following specifications:

- Braided shield or foil shield with drain wire
- Shield must be wired to ground at indoor unit
- 22-18AWG stranded tinned copper
- Twisted pair (minimum 4 twists per foot)
- Low Capacitance (15pF/FT or less)
- Must be rated to meet local codes and conditions
- EXAMPLES BELDEN 89207 (PLENUM RATED), OR ALPHA WIRE 6454 CATEGORY 5, 5E, OR HIGHER

22. Do not run in same conduit, raceway, or chase as high voltage wiring.

23. For CANbus network lengths greater than 450FT (137M) call Factory.

OPTIONAL COMMUNICATION CONNECTIONS

24. Unit-To-Unit – Plug 64 is reserved for U2U communication.

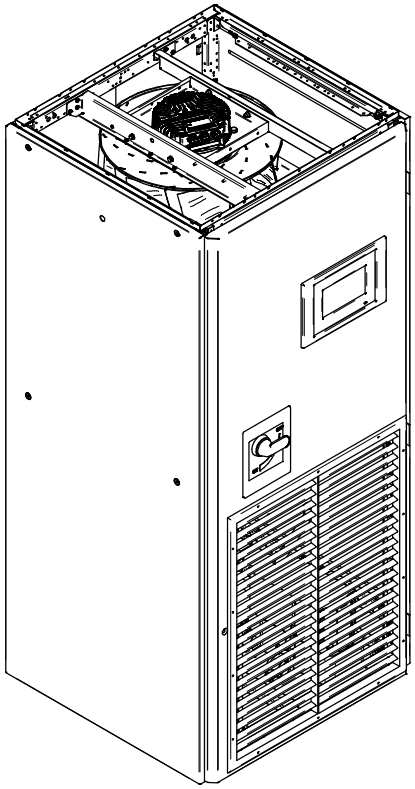
25. Site and BMS – Plug 74 and terminal block 3 are reserved for Site and BMS connections. Plug 74 is an eight pin RJ45 for a Cat 5 cable. Terminal block 3 is a two position screw terminal block for use with twisted pair wires. Only one of these connections can be used at a time.

NOTE: Refer to specification sheet for total unit full load amps, wire size amps, and max overcurrent protective device size.

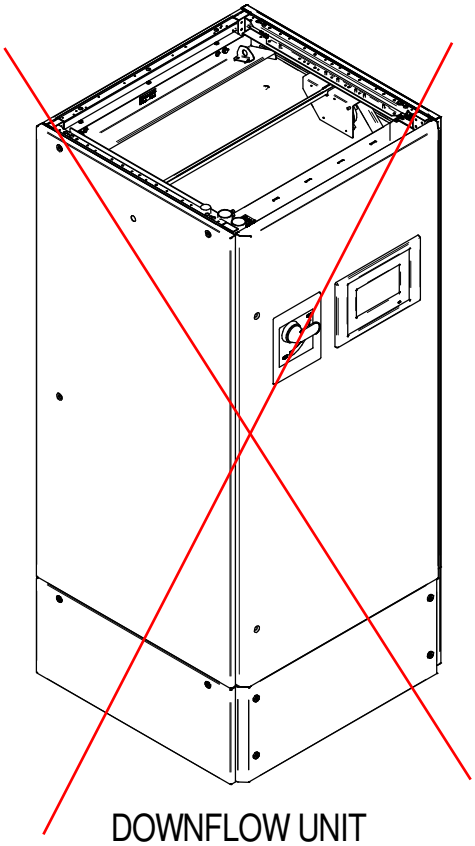
VERTIV.

LIEBERT PDX & PCW

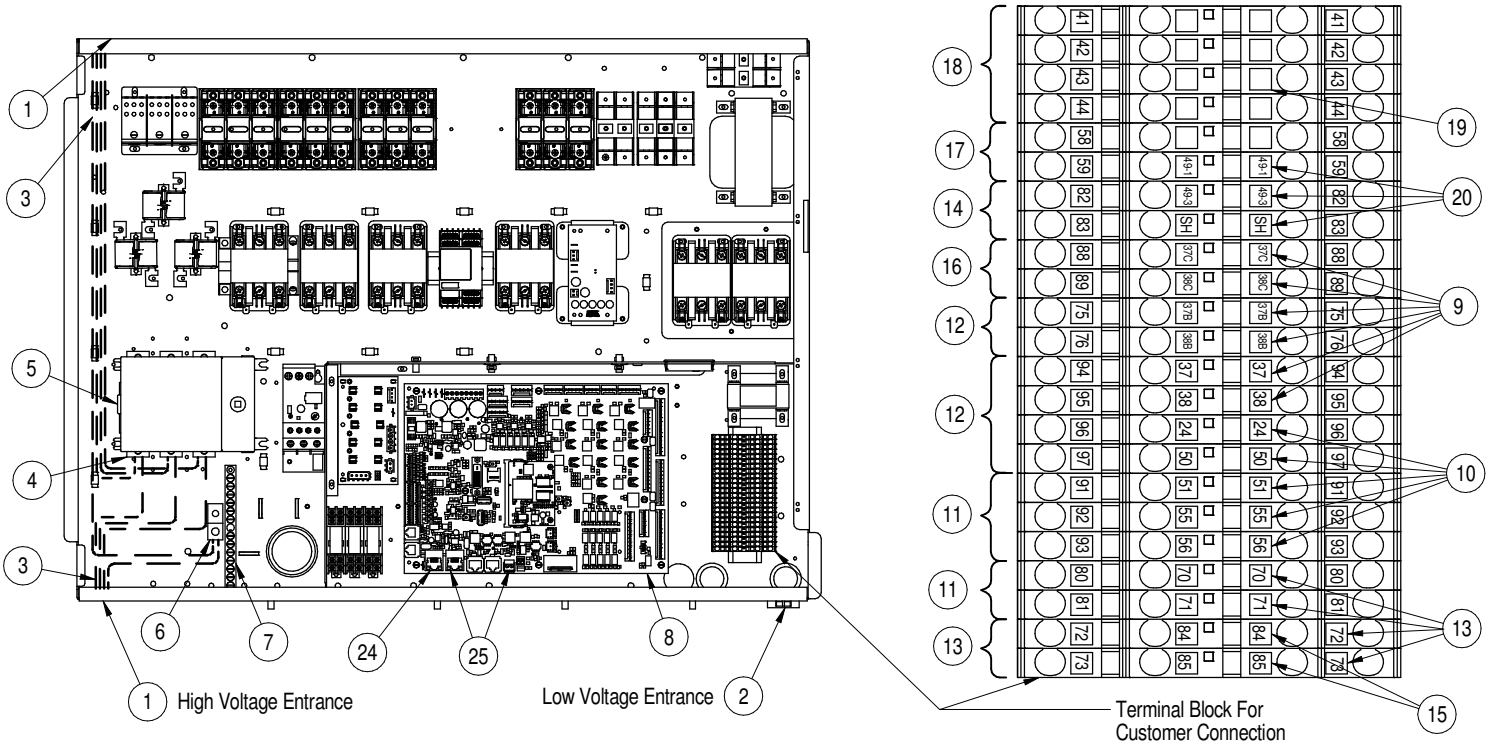
ELECTRICAL FIELD CONNECTIONS
UPFLOW & DOWNFLOW MODELS



UPFLOW UNIT



DOWNFLOW UNIT

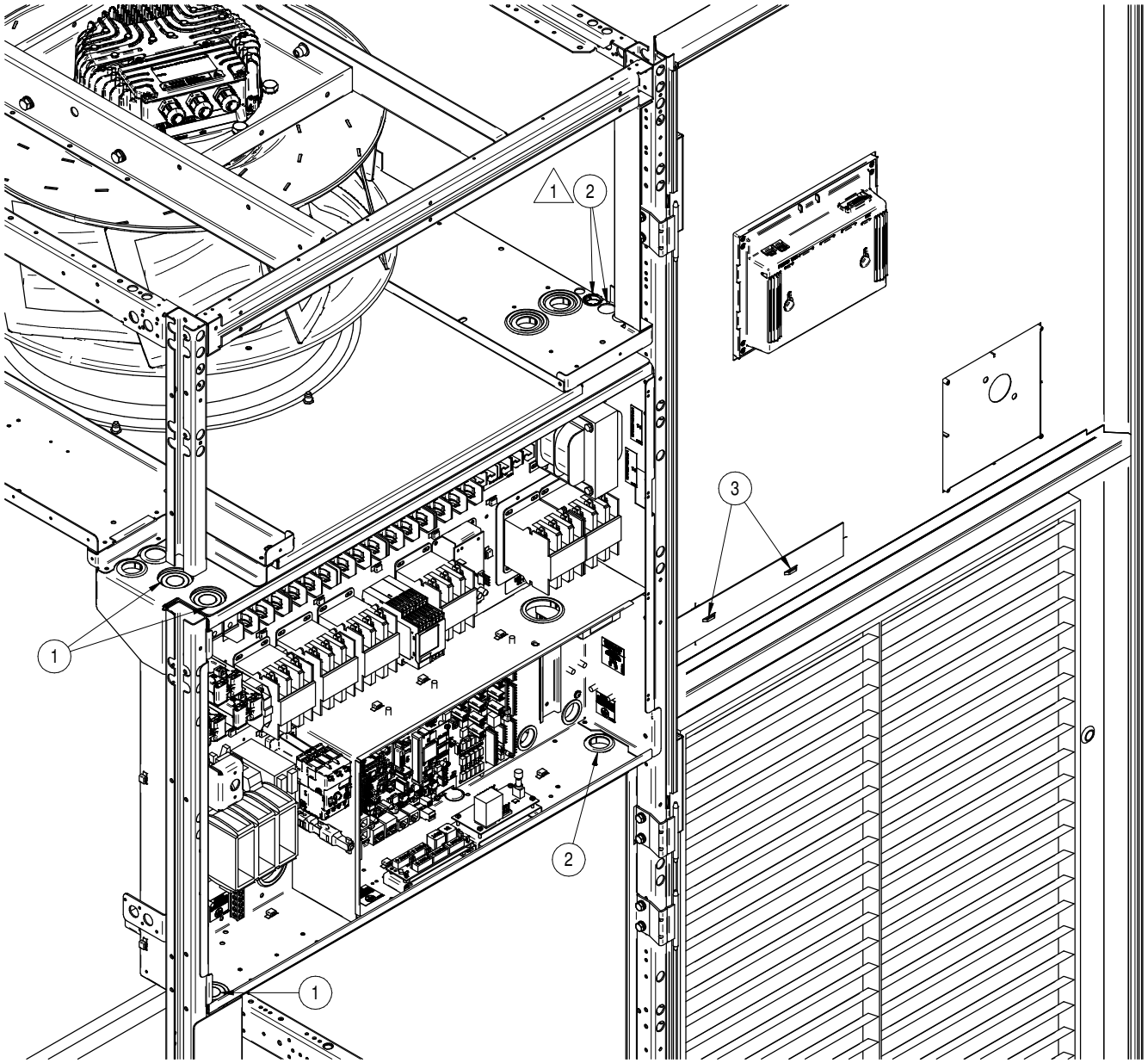


VERTIV.

LIEBERT PDX & PCW

ELECTRICAL FIELD CONNECTIONS

UPFLOW MODELS



(1) Opening for field wiring. Suggested entry point for HV field wiring to unit.

(2) Opening for field wiring. Suggested entry point for LV field wiring to unit.

(3.) Wire tie anchors. Use to secure customer wiring.

Notes:

1. Wire needs to be routed outside Electric Box to Low Voltage knockout on bottom of Electric Box.

VERTIV.

LIEBERT® iCOM™

PRODUCT INFORMATION
UNIT MOUNTED DISPLAY

The Liebert® iCOM™ display is a 7-inch capacitive, color-touchscreen display in an ergonomic, aesthetically pleasing housing. The display and housing will be viewable while the unit accent panels are open or closed. The display can be easily detached to view while the panel is open.

Menu Layout- The menus will be broken out into two main menu screens: User screen and Service screen. The User screen contains the menus to access parameters required for basic unit control and setup. The Service screen is designed for service personal and provides access to advanced control setup features and diagnostic information.

Password Protection- The display will contain two unique passwords to protect against unauthorized changes. An auto hide/show feature allows the user to see applicable information based on the login used. These four-digit passwords may be customized according to User preference.

Unit Backup and Restore- The user shall have the ability to create safety copies of important control parameters. The display has the ability for the user to automatically backup unit configuration settings to internal memory or USB storage drive. Configuration settings may be transferred to another unit for a more streamlined unit startup.

Parameter Search- The display has search fields for efficient navigation and parameter lookup.

Parameter Download- The Liebert® iCOM™ shall enable the user to download a report that lists parameter names, factory default settings, and the user programmed settings in .csv format for remote reference.

Parameter Directory- The Liebert® iCOM™ shall provide a directory that lists all parameters in the control. The list shall provide Line ID numbers, parameter labels, and current parameter values.

PRODUCT INFORMATION
UNIT MOUNTED DISPLAY

Context Sensitive Help- The display will have an onboard help database. The database will provide context sensitive help to assist with setup and navigation of the menus.

Display Setup- The user has the ability to configure the display information based on the specific user's preference. Language, units of measure, screen contrast, home screen layout, back light timer and the hide/show of certain readouts will be configurable through the display.

Additional Readouts- The display has the ability for the user to configure custom widgets on the main screen. Widget options will include items such as fan speed, call for cooling, call for free cooling, maintenance status, call for hot water reheat, call for electric reheat, call for dehumidification, call for humidification, airflow, static pressure, fluid flow rate and cooling capacity.

Status LEDs- The display will provide the user with the unit's operating status using an integrated LED. The LED will indicate if the unit has an active alarm; if the unit has an active alarm that has been acknowledged; or if the unit is on, off, or in a standby status.

Unit Alarms – All unit alarms are annunciated through both audio and visual cues, clearly displayed on the screen, automatically recorded in the event log, and communicated to monitoring plug connections.

Event Log – The display will automatically store the last 400 unit-only events (messages, warnings, and alarms).

Service Contact Information – The display has the ability to store the local service or sales contact information.

Upgradeable –Display and Control Board software upgrades are performed through a USB connection.

Unit-to-Unit (U2U) Communication – Communication via private Ethernet network allows for advanced control functionality (Teamwork modes, sharing sensor data, Standby Rotation, Lead-Lag, and Cascade operation).

Temperature Control- Precision temperature control is maintained while maximizing efficiency based on a user entered setpoint and tolerance.

Various Control Types- Proportional, PI (proportional-integral), or Intelligent control types can be selected for supply or return temperature. These control types have been developed to maximize component life and maintain precise environmental control.

Timers/Sleep Mode- The menus shall allow various customer settings for turning the unit On or Off.

Sensor Calibration- The menus shall allow unit sensors to be calibrated with external sensors.

Maintenance/Wellness Settings- The menus shall allow reporting of potential component problems before they occur.

PRODUCT INFORMATION
UNIT MOUNTED DISPLAY

Options Setup- The menus shall provide operation settings for the installed components.

Auto Restart- The unit will return to its previous operating status after loss of power. Units can be stagger started to minimize system current draw.

Auxiliary Boards- The menus shall allow setup of optional expansion boards.

Various Sensors: The menus shall allow setup and display of optional custom sensors. The control shall include four customer accessible analog inputs for field-supplied sensors. The analog inputs shall accept a 4 to 20mA signal. The user shall be able to change the input to 0 to 5VDC or 0 to 10VDC. The gains for each analog input shall be programmable from the front display. The analog inputs shall be able to be monitored from the front display.

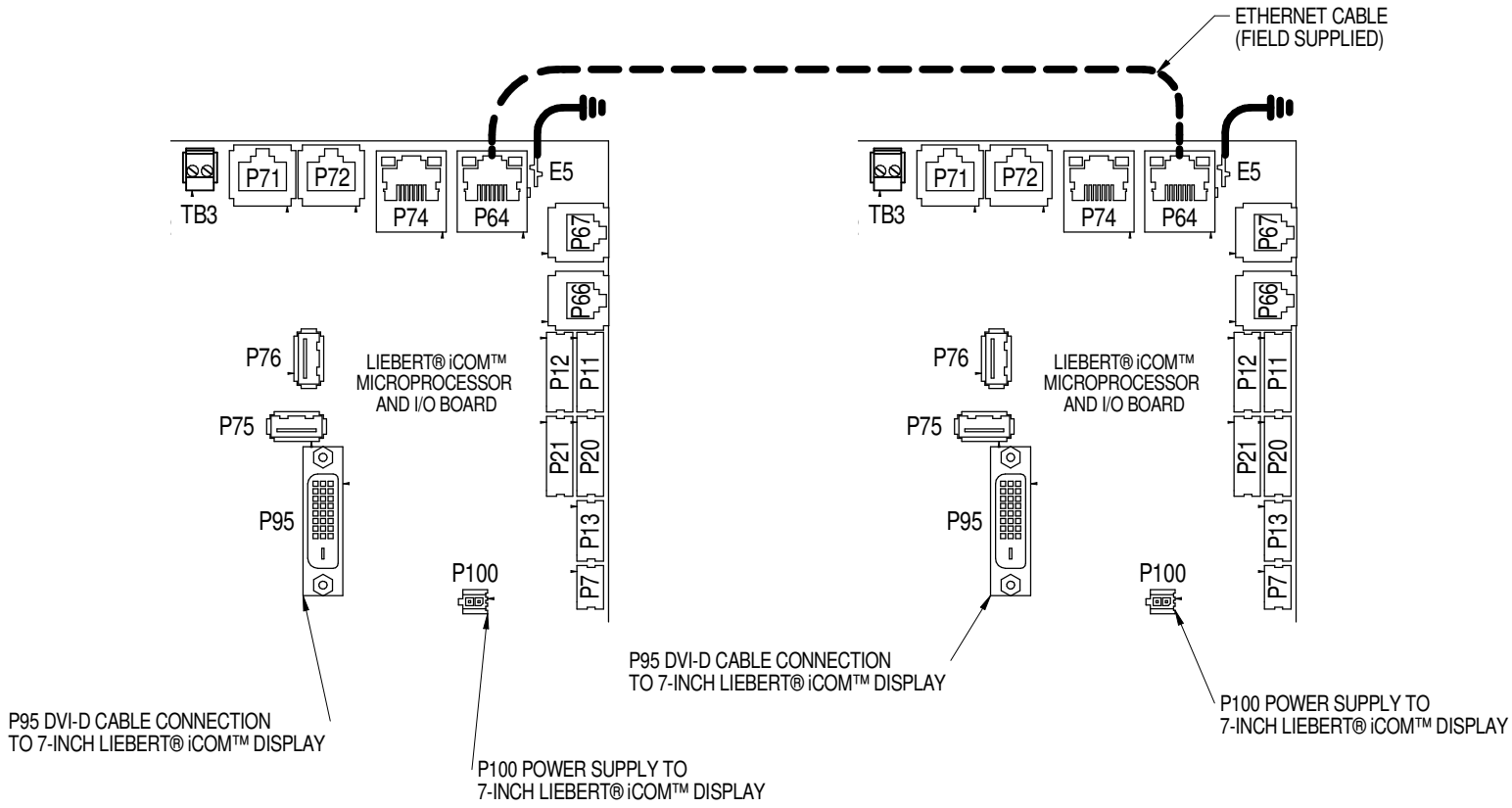
Diagnostics/Service Mode- The Liebert® iCOM™ control shall be provided with self-diagnostics to aid in troubleshooting. The microcontroller board shall be diagnosed and reported as pass/not pass. Control inputs shall be indicated as On or Off at the front display. Control outputs shall be able to be turned On or Off from the front display without using jumpers or a service terminal. Each control output shall be indicated by an LED on a circuit board.

VERTIV.

LIEBERT® iCOM™

UNIT TO UNIT NETWORK CONNECTIONS

LIEBERT® CW, LIEBERT® CWA, LIEBERT® DS, LIEBERT® DSE, LIEBERT® PDX, LIEBERT® PCW



NOTE* For dual-unit network configurations only

LIEBERT® LIQUI-TECT™ 410 POINT LEAK DETECTION SENSOR

Product Specification/Installation Guide

The Liebert® Liqui-Tect™ 410 (LT410) provides single-point detection of leaks. The point-detection sensor has two gold-plated sensing probes to prevent corrosion and to provide accurate readings. The LT410 constantly monitors for leaks, internal faults, and power failures and warns of any abnormal conditions. Mounting brackets allow for sensor height adjustment and leveling.

The LT410 is the ideal solution for sensing leaks under a raised computer floor or air conditioning drip pans. Two independent outputs provide added flexibility with the capacity to signal both a local alarm panel, Liebert cooling unit and a remote building management system or external equipment, such as motorized water shutoff valves.

LT410 APPLICATIONS

The LT410 is ideally suited for:

- Glycol and chilled water cooling,
- Humidification supply water piping,
- Condensate pumps and drains,
- Unit and ceiling auxillary drip pans,
- Overhead piping troughs.

LOCATIONS/PLACEMENT

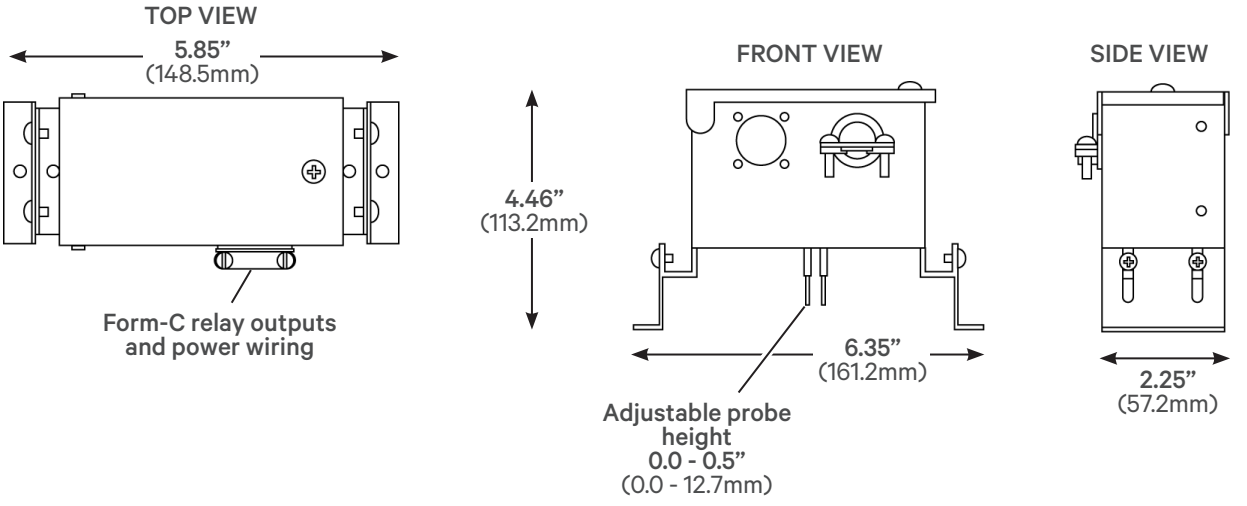
The LT410 is an excellent choice for:

- Large scale network control centers,
- Data centers,
- Server rooms and closets,
- Unattended, remote shelters,
- Mechanical equipment rooms,
- Sensitive areas with overhead piping,
- Industrial process control rooms.

COMPONENTS OF THE LIQUI-TECT™ 410 MODULE

The LT410 consists of a metal enclosure with a hinged top door that provides access to the internal wiring termination. It includes side access through a box connector for installation of the power and contact wiring. The mounting brackets attach to the enclosure with adjustable slots to allow custom setting of the height of the sensing probes.

DIMENSIONS - TOP, FRONT AND SIDE



SPECIFICATIONS

Power Requirements	24 VAC 100 mA, 50/60 Hz, 3 VA (max.)
Dimensions, W x D x H	6.35 in. x 2.25 in. x 4.46 in. (161.2 mm x 57.2 mm x 113.2 mm)
Weight (assembled)	2.0 lb. (0.9 kg)
Metal Enclosure	NEMA 1, IP 30

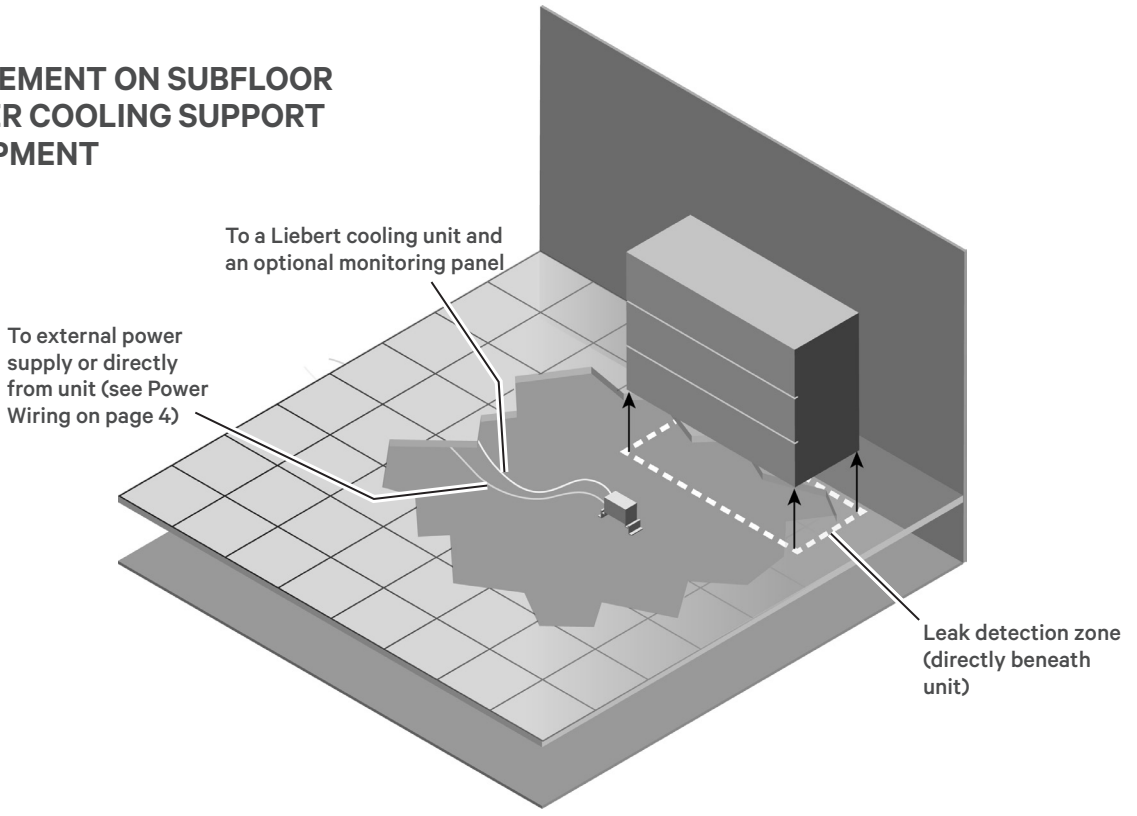
ENVIRONMENTAL CONDITIONS

Operating Temperature	50°F to 104°F (10°C to 40°C)
Operating Humidity	10% to 95% relative humidity (non-condensing)
Operating Altitude	0 to 10,000 ft. (0 to 3,048 m)
Output Relay Contact Rating	2 Form-C; 3 A rating at 24 VAC

AGENCY LISTINGS

UL	UL916
C-UL	C22.2, No. 205-M1983
CE	Yes
FCC Compliance	47 CFR, Part 15

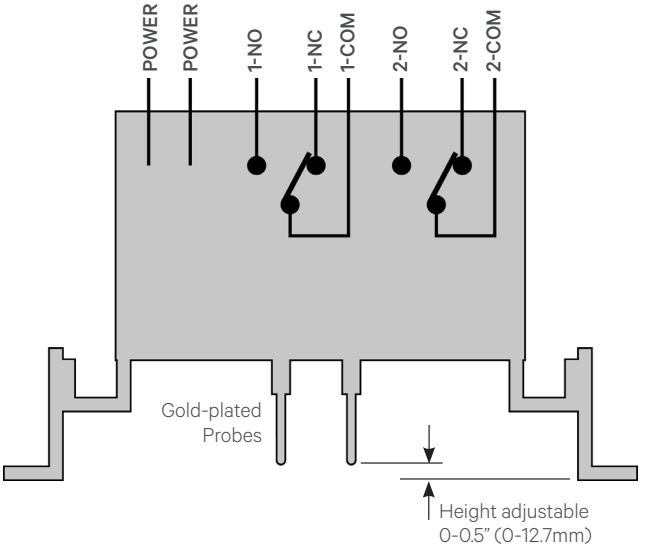
PLACEMENT ON SUBFLOOR UNDER COOLING SUPPORT EQUIPMENT



WIRING INTERCONNECTIONS

Circuits are shown in powered, non-alarm state.

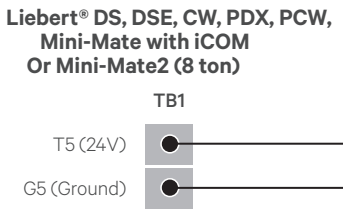
NOTE: All power and alarm connections must be Class 2 circuits.

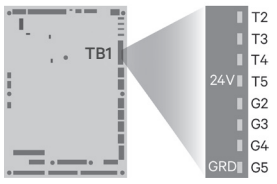


Red Wires	Orange Wires	Yellow Wires
24 V, AC/DC @ 0.10A, 50-60 Hz, DC Class 2 Circuit Only	Alarm Contact Rating 24 VAC @ 3A Class 2 Circuit Only	Alarm Contact Rating 24 VAC @ 3A Class 2 Circuit Only

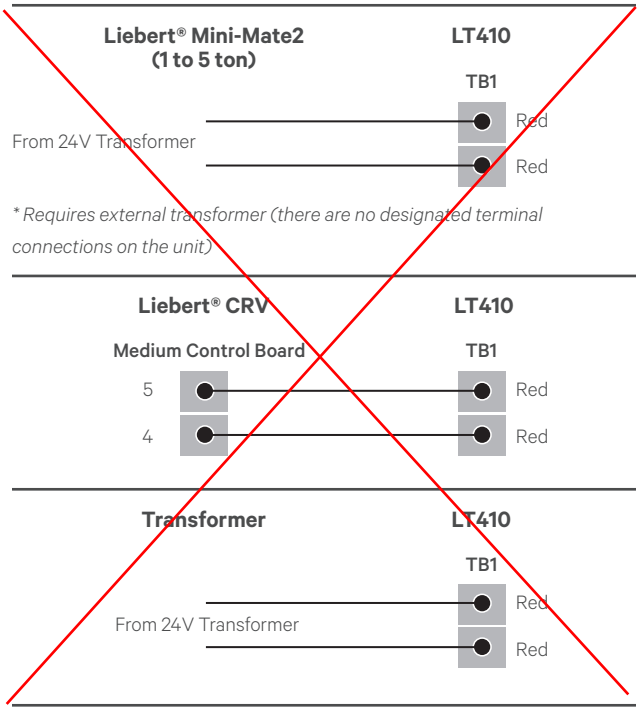
POWER WIRING

The LT410 is rated for 24 VAC, 50/60 Hz, and 0.10 A.





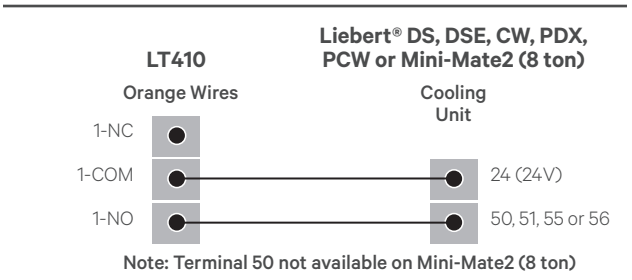
Location of T5 (24V) connection on main controller board of Liebert unit.



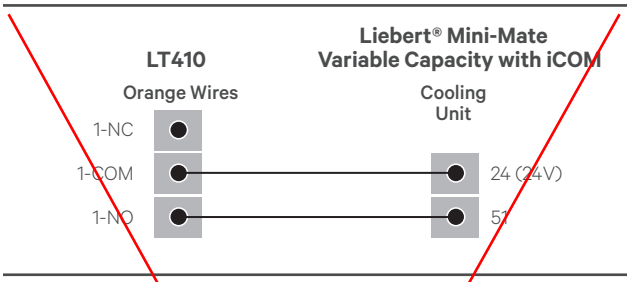
** Requires external transformer (there are no designated terminal connections on the unit)*

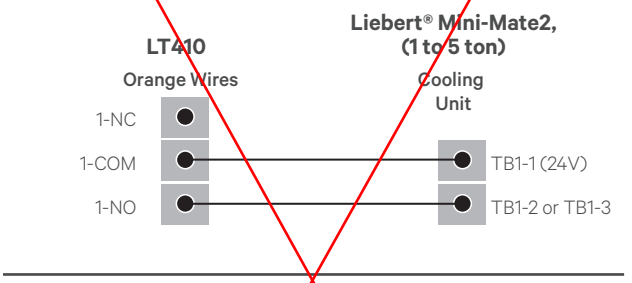
WIRING TO AUXILIARY ALARM PANELS

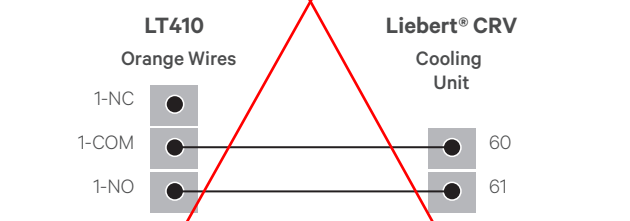
The LT410 has two Form-C dry contact alarm output contacts: one orange wire and two yellow wires. Each contact is rated for 24 VAC at 3 amp.



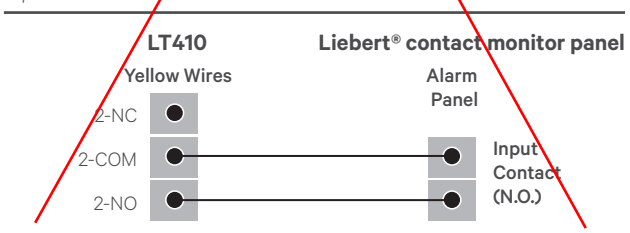
Note: Terminal 50 not available on Mini-Mate2 (8 ton)







NOTE: In Liebert® iCOM™, use the Service Options menu to add that the Liqui-Tect™ is installed.



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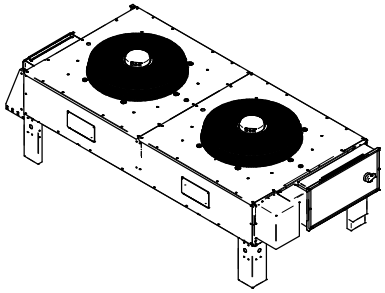
VERTIV.

LIEBERT MC CONDENSER

PREMIUM EFFICIENCY CONTROL
STANDARD & OPTIONAL FEATURES



STANDARD FEATURES

COIL Liebert microchannel coils are all-aluminum construction. Tubes are created by extruding small parallel refrigerant flow paths into aluminum. Full-depth louvered aluminum fins fill spaces between the tubes. Tubes, fins and aluminum headers are oven-brazed to form a complete refrigerant-to-air heat exchange coil. Baffles are used in the headers to separate one coil slab into multiple passes as needed. Coils are factory leak tested at a minimum of 300 PSIG and dehydrated. Copper stub pipes are electric resistance welded to aluminum coils and joints are protected with polyolefin to seal joint from environmental corrosive elements. Hot gas and liquid lines are brazed to the stub pipes with spun closed ends for customer piping connections. Coil pipe assembles are filled and sealed with a nitrogen holding charge for shipment. One coil is used per fan assembly.

FAN/MOTOR ASSEMBLY The fan/motor assembly is complete with external rotor motor, fan blades and fan/finger guard. Fan blades are constructed of stamped aluminum or steel extrusion coated with PP plastic. Fan guards are heavy gauge, close meshed, steel wire, coated with a black corrosion resistant finish. Fan terminal blocks located on the top of the fan guard with IP54 protection class. Fans are factory balanced and tested before shipment.

FAN MOTORS Fan motors are specifically designed for variable speed and have ball bearings. The EC fans provide internal overload protection through the built-in electronics. Each EC fan motor has built-in controller and communication module, linked via RS485 communication wire to each fan and the Premium Control Board. This allows each fan to receive and respond to precise fan speed inputs from the Premium control board.

PREMIUM EFFICIENCY FAN CONTROL The Liebert premium efficiency condenser control system is complete with control board, EC fan motor(s),refrigerant-pressure transducer(s), refrigerant-temperature thermistor(s), ambient-temperature thermistor, and motor overload protection in the factory wired control panel. The control board maintains EC fans on the same circuit to the same speed in order to maintain refrigerant head pressure. The control board receives a run signal from the compressor of the indoor unit via field-supplied low voltage interlock wires and field-supplied CANbus communication wires from the indoor unit iCOM. The control system provides refrigerant head pressure and system starting for outdoor ambient temperature as low as -30°F (-35 °C), provided the total temperature design range (from minimum to maximum) is 125°F (70°C) or less.

HOUSING The condenser housing is constructed of bright aluminum sheet and divided into individual fan sections by full width baffles. Internal structural support members, including coil support frame, are galvanized steel for strength and corrosion resistance. Panel doors are provided on two sides of each coil/fan section to provide for coil cleaning. Aluminum legs are provided with rigging holes for hoisting the unit into position.

COMMUNICATION The Premium Efficiency Control communicates with the iCOM control of the indoor Liebert unit using field supplied CANbus wires. The communication link allows for condenser alarm condition communication to iCOM, communication of other measurable items on the condenser, and fan control features to improve efficiency, sound and wintertime operation based on iCOM programming.

UNIT DISCONNECT SWITCH Locking unit disconnect switch is factory installed and wired in attached condenser control section.

OPTIONAL FEATURES

~~**LIEBERT LEE-TEMP LOW AMBIENT CONTROL** Lee-Temp receiver kits can be added to achieve head pressure control down to minimum ambient temperatures of -30 °F (-34 °C). The premium efficiency fan control when used with the Liebert Lee-Temp receiver kits runs the fan(s) at lower speeds during cold temperatures saving fan energy.~~

~~**575V POWER SUPPLY** The factory installed condenser option will include a secondary enclosure, a 575V-to-480V, 3 phase, step down transformer, secondary fuses for the transformer, and all wiring between the main and secondary electrical enclosures. Site power connections will be made in the main electrical enclosure and the secondary enclosure will be located on the condenser end opposite of the main electrical enclosure.~~

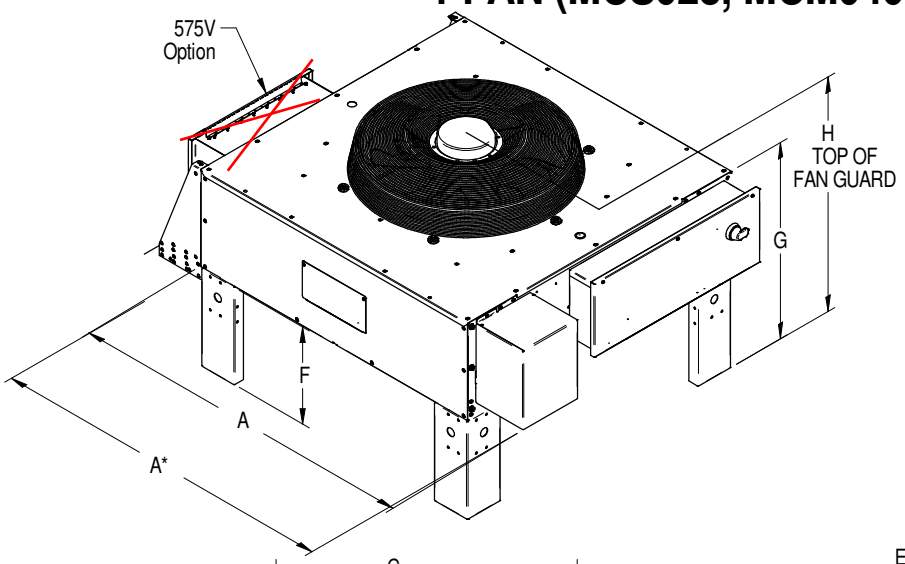
E-COAT COIL PROTECTION The aluminum microchannel coil is epoxy-coated for extended coil life in corrosive environments, such as coastal areas. Factory-applied E-coat using immersion and baking process provides a flexible epoxy-coating to all coil surfaces and ensures complete coil encapsulation. Coil color is black and a factory-applied UV topcoat protects the E-coat from solar UV ray degradation.

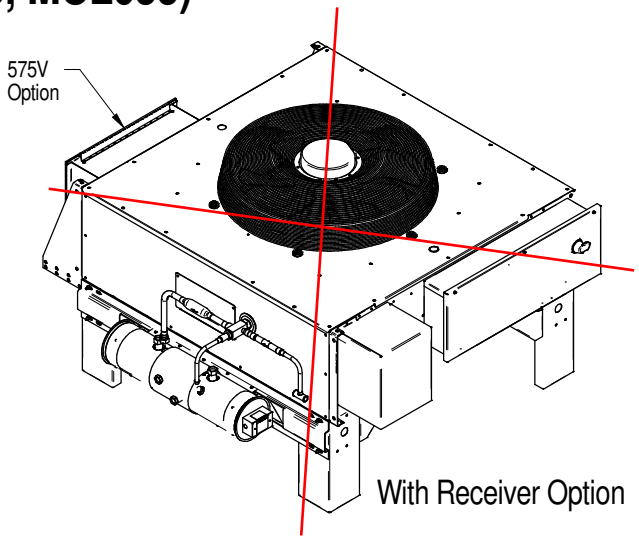
VERTIV.

LIEBERT MC CONDENSER

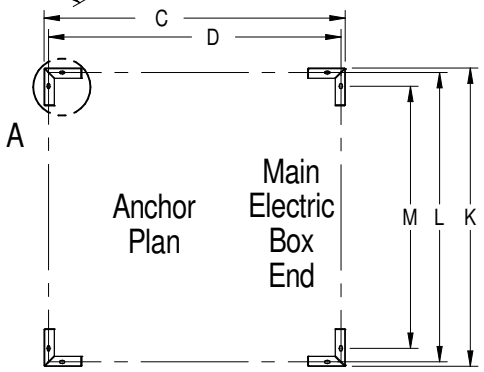
CABINET & ANCHOR DIMENSIONAL DATA

1 FAN (MCS028, MCM040, MCL055)

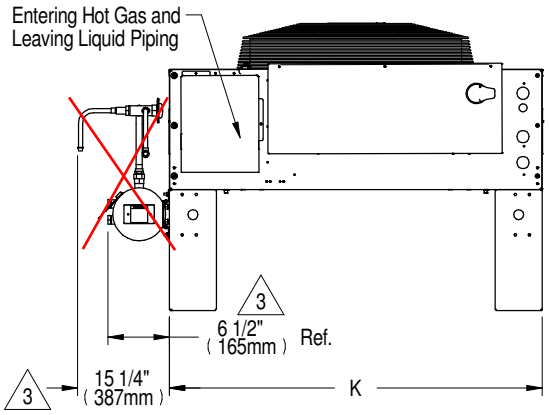




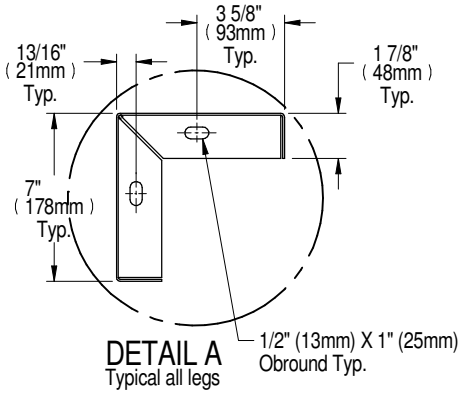
With Receiver Option



Left Side of Unit



Front View (Lee-Temp Shown)



DETAIL A
Typical all legs

LIEBERT MODEL NUMBER	F in. (mm) (LEG HEIGHT DIMENSIONS) △2			
	18 (457)	36 (914)	48 (1219)	60 (1524)
MCS028 ~~MCM040~~				
DIM "G"	31-5/8 (803)	49-5/8 (1260)	61-5/8 (1565)	73-5/8 (1870)
DIM "H"	39-5/8 (1006)	57-5/8 (1464)	69-5/8 (1768)	81-5/8 (2073)
~~MCL055~~				
~~DIM "G"~~	~~35-7/8 (911)~~	~~53-7/8 (1368)~~	~~65-7/8 (1673)~~	~~77-7/8 (1978)~~
~~DIM "H"~~	~~43-5/8 (1108)~~	~~61-5/8 (1565)~~	~~73-5/8 (1870)~~	~~85-5/8 (2175)~~

Note:
1. Liebert recommends a clearance of 36" (915mm) on each side for proper operation and component access.
△2. Cross Bracing required for legs longer than 18" (457.2mm). Quantity varies per model & options selected.
△3. For PDX w/EEV systems & unheated refrigerant receivers, 6-1/2" (165mm) is 9-1/4" (235mm) and 15-1/4" (387) is not applicable.

LIEBERT MODEL NUMBER	A in (mm)	A* in (mm) (575V ONLY)	C in (mm)	D in (mm)	K in (mm)	L in (mm)	M in (mm)
MCS028	50-5/8 (1287)	58-7/8 (1495)	44-1/8 (1120)	42-1/2 (1080)	42-1/2 (1080)	40-7/8 (1038)	35-7/8 (910)
~~MCM040~~	~~57-3/16 (1453)~~	~~65-3/8 (1661)~~	~~48 (1219)~~	~~46-5/16 (1177)~~	~~46 (1168)~~	~~44-3/8 (1127)~~	~~39-5/16 (999)~~
~~MCL055~~	~~68 (1727)~~	~~77 (1956)~~	~~56 (1422)~~	~~54-3/8 (1381)~~	~~55-1/2 (1410)~~	~~53-7/8 (1368)~~	~~48-3/4 (1238)~~

VERTIV.

LIEBERT MC CONDENSER

CONDENSER AND OPTION WEIGHT DATA, lb(kg)

Size		Small (MCS)		Medium (MCM)			
Condenser Model		MCS028	~~MCS056~~	~~MCM040~~	~~MCM080~~		~~MCM160~~
Refrigerant Circuits		1	~~2~~	~~1~~	~~1~~	~~2~~	~~2~~
Condenser Dry Weight	18" Leg	154 (70)	~~270 (122)~~	~~231 (105)~~	~~441 (200)~~	~~441 (200)~~	~~860 (390)~~
	36" Leg	286 (130)	~~419 (190)~~	~~363 (165)~~	~~590 (268)~~	~~590 (268)~~	~~1066 (484)~~
	48" Leg	318 (144)	~~451 (205)~~	~~395 (179)~~	~~622 (282)~~	~~622 (282)~~	~~1114 (505)~~
	60" Leg	349 (158)	~~482 (219)~~	~~426 (193)~~	~~653 (296)~~	~~653 (296)~~	~~1160 (526)~~
Additional Weight for Options							
PDX-EEV Receiver		~~45 (20)~~		~~45 (20)~~	~~45 (20)~~		
Lee-Temp		~~55 (25)~~	~~110 (50)~~	~~55 (25)~~	~~100 (45)~~	~~110 (50)~~	~~220 (100)~~
DSE Receiver DA050/080/085					~~45 (20)~~		~~90 (41)~~
DSE Receiver DA125/150/165					~~92 (42)~~		~~184 (83)~~
575V Transformer		~~55 (25)~~	~~65 (29)~~	~~60 (27)~~	~~70 (32)~~	~~70 (32)~~	~~80 (36)~~
Coated Coil		4 (2)	~~8 (4)~~	~~5 (2)~~	~~10 (5)~~	~~10 (5)~~	~~20 (9)~~
Seismic/Wind Bracing 18" legs		~~40 (18)~~	~~40 (18)~~	~~40 (18)~~	~~40 (18)~~	~~40 (18)~~	~~57 (26)~~

~~Size~~		Large (MCL)					
~~Condenser Model~~		~~MCL055~~	~~MCL110~~		~~MCL165~~	~~MCL220~~	
~~Refrigerant Circuits~~		~~1~~	~~1~~	~~2~~	~~1~~	~~1~~	~~2~~
~~Condenser Dry weight~~	~~18" Leg~~	~~344 (156)~~	~~602 (273)~~	~~602 (273)~~	~~891 (404)~~	~~1186 (538)~~	~~1186 (538)~~
	~~36" Leg~~	~~486 (220)~~	~~766 (347)~~	~~766 (347)~~	~~1136 (515)~~	~~1453 (659)~~	~~1453 (659)~~
	~~48" Leg~~	~~518 (235)~~	~~798 (362)~~	~~798 (362)~~	~~1184 (537)~~	~~1501 (681)~~	~~1501 (681)~~
	~~60" Leg~~	~~549 (249)~~	~~829 (376)~~	~~829 (376)~~	~~1230 (558)~~	~~1547 (702)~~	~~1547 (702)~~
Additional Weight for Options							
~~PDX-EEV Receiver~~		~~45 (20)~~					
~~Lee-Temp~~		~~60 (27)~~	~~115 (52)~~	~~120 (54)~~	~~175 (79)~~	~~215 (98)~~	~~240 (109)~~
~~DSE Receiver DA050/080/085~~			~~45 (20)~~	~~90 (41)~~	~~45 (20)~~	~~45 (20)~~	~~90 (41)~~
~~DSE Receiver DA125/150/165~~			~~94 (43)~~		~~94 (43)~~	~~94 (43)~~	~~188 (85)~~
~~575V Transformer~~		~~67 (30)~~	~~77 (35)~~	~~77 (35)~~	~~118 (54)~~	~~118 (54)~~	~~118 (54)~~
~~Coated Coil~~		~~8 (4)~~	~~16 (7)~~	~~16 (7)~~	~~24 (11)~~	~~32 (15)~~	~~32 (15)~~
~~Seismic/Wind Bracing 18" legs~~		~~40 (18)~~	~~40 (18)~~	~~41 (19)~~	~~57 (26)~~	~~57 (26)~~	~~57 (26)~~

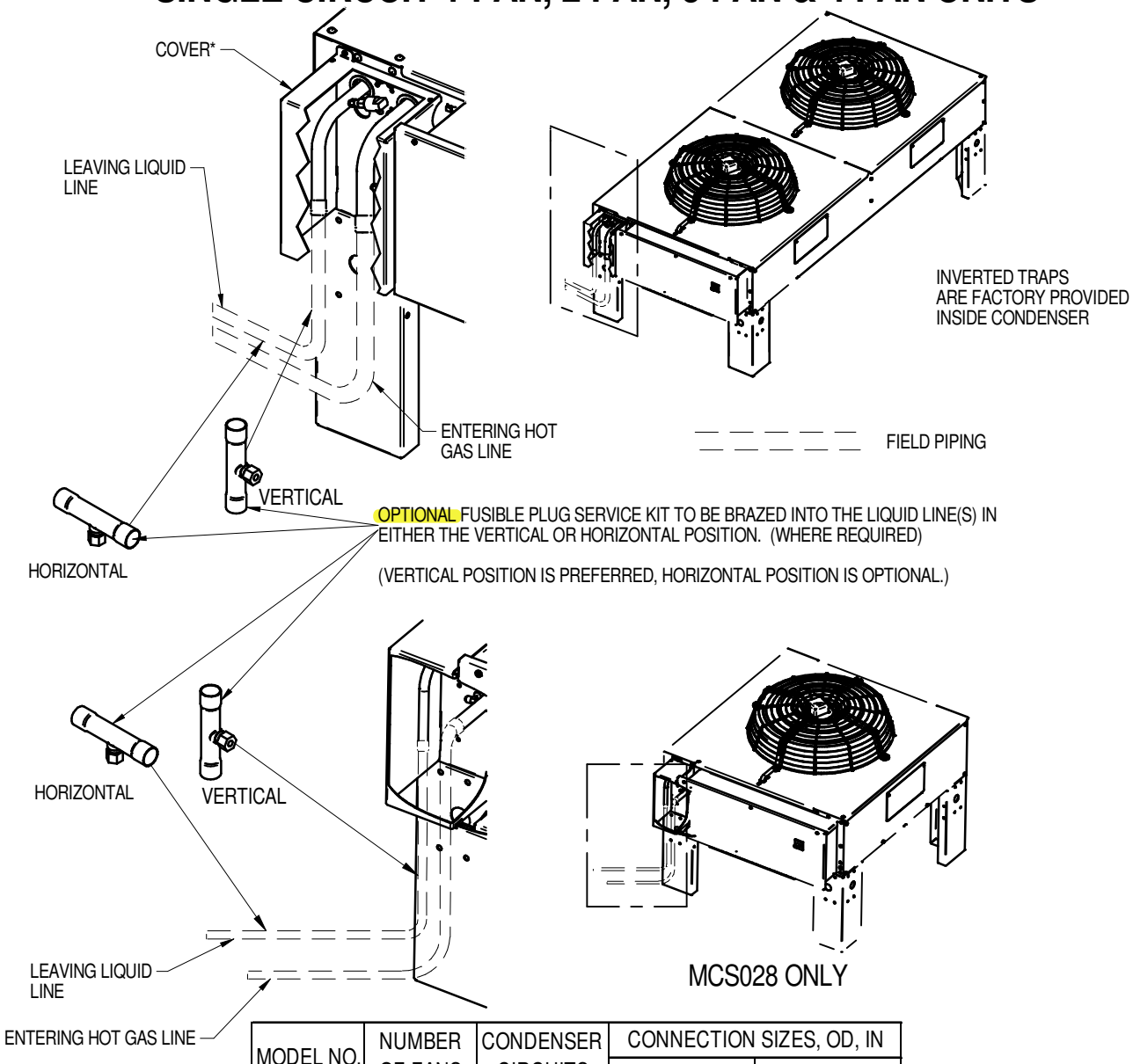
Total weight is the sum of '**Condenser**' + ('**PDX-EEV Receiver**' or '**Lee-Temp**' or '**DSE Receiver 050/080/085**' or '**DSE Receiver 125/150/165**')'+'**Coated Coil**' + '**575V Transformer**'.+ '**Seismic/Wind Bracing**'

VERTIV.

LIEBERT MC CONDENSER

PIPING DIMENSIONAL DATA

SINGLE CIRCUIT 1 FAN, 2 FAN, 3 FAN & 4 FAN UNITS



MODEL NO.	NUMBER OF FANS	CONDENSER CIRCUITS	CONNECTION SIZES, OD, IN	
			HOT GAS LINE	LIQUID LINE
MCS 028	1	1	7/8	5/8
~~MCM 040~~	~~1~~	~~1~~	~~7/8~~	~~5/8~~
~~MCM 080~~	~~2~~	~~1~~	~~1-1/8~~	~~7/8~~
~~MCL 055~~	~~1~~	~~1~~	~~1-1/8~~	~~7/8~~
~~MCL 110~~	~~2~~	~~1~~	~~1-3/8~~	~~1-1/8~~
~~MCL 165~~	~~3~~	~~1~~	~~1-3/8~~	~~1-1/8~~
~~MCL 220~~	4	~~1~~	~~1-5/8~~	~~1-3/8~~

* SHIPPING COVER IS NOT NECESSARY FOR PROPER CONDENSER OPERATION AND MAY BE RECYCLED IF FIELD PIPING INTERFERES WITH PROPER REATTACHMENT.

VERTIV.

LIEBERT AIR COOLED SYSTEMS

RECOMMENDED REFRIGERANT LINE SIZES CU, OD

LIEBERT AIR-COOLED SYSTEMS USING R-410A

System Fluid : R-410A		Any Compressor Type				
Indoor Model	Equivalent Length	50 ft (15m)	100 ft (30m)	150 ft (45m)	300 ft (91m)	450ft (137m)
CR019RA/ CR020RA	Hot Gas Line, in.	3/4	3/4	3/4	7/8 [2]	
	Liquid Line, in.	5/8	5/8	5/8	3/4	
CR035RA	Hot Gas Line, in.	7/8	7/8	7/8	1-1/8 [2]	
	Liquid Line, in.	3/4	3/4	3/4	7/8	
PX011	Hot Gas Line, in.	1/2	5/8 [2]	5/8 [2]	5/8 [2]	
	Liquid Line, in.	3/8	1/2	1/2	1/2	
PX018	Hot Gas Line, in.	5/8	5/8	5/8	3/4 [2]	
	Liquid Line, in.	1/2	1/2	1/2	5/8	
PX023	Hot Gas Line, in.	3/4	3/4	3/4	7/8 [2]	
	Liquid Line, in.	5/8	5/8	5/8	5/8	
PX029	Hot Gas Line, in.	7/8	7/8	7/8	1-1/8 [2]	
	Liquid Line, in.	5/8	5/8	5/8	3/4	
DA050 / DA080/ DA085	Hot Gas Line, in.	1-1/8	1-1/8	1-1/8	1-1/8	1-1/8 [3]
	Liquid Line, in.	7/8	7/8	7/8	7/8	7/8 [3]
DA125	Hot Gas Line, in.	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8 [3]
	Liquid Line, in.	7/8	7/8	7/8	7/8	7/8 [3]
DA150	Hot Gas Line, in.	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8 [3]
	Liquid Line, in.	7/8	1-1/8	1-1/8	1-1/8	1-1/8 [3]
DA165	Hot Gas Line, in.	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8 [3]
	Liquid Line, in.	7/8	1-1/8	1-1/8	1-1/8	1-1/8 [3]
DA250 / DA265	Hot Gas Line, in.	1-5/8	1-5/8	1-5/8 [4]	1-5/8 [4]	
	Liquid Line, in.	1-3/8	1-3/8	1-3/8 [4]	1-3/8 [4]	

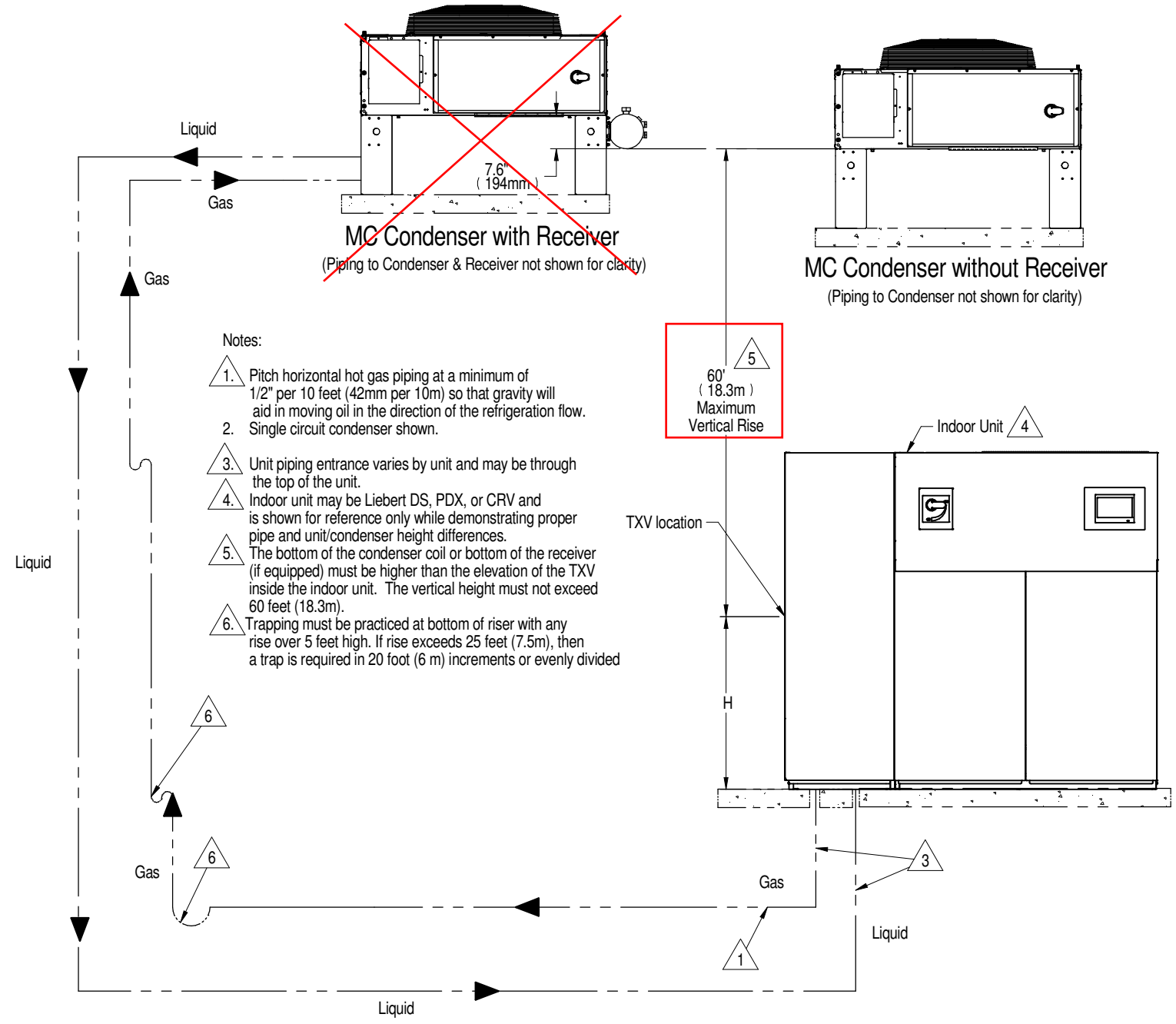
System Fluid: R-410A		Digital Scroll Models				
Indoor Model	Equivalent Length	50 ft (15m)	75 ft (23m)	100 ft (30m)	125 ft (38m)	150 ft (45m)
MT036	Suction Line, in.	7/8	7/8	7/8	7/8	7/8
	Liquid Line, in.	1/2	1/2	1/2	1/2	1/2
MT048	Suction Line, in.	7/8	1-1/8 [2]	1-1/8 [2]	1-1/8 [2]	1-1/8 [2]
	Liquid Line, in.	1/2	1/2	5/8	5/8	5/8
MT060	Suction Line, in.	1-1/8	1-1/8	1-1/8	1-1/8	1-1/8
	Liquid Line, in.	1/2	5/8	5/8	5/8	5/8

Notes:
1. Consult factory for proper line sizing for runs longer than maximum equivalent length shown in table.
2. Must downsize vertical riser one trade size (1-1/8" to 7/8" or 7/8" to 3/4" or 3/4" to 5/8" or 5/8" to 1/2").
3. Consult factory when actual pipe length between condenser/Liebert® EconoPhase and Liebert® DSE unit will exceed 300 ft (91 m).
4. Liebert DA250-265 unit can be extended to max 200ft (61m) linear or 300ft. (91m) equivalent.

VERTIV.

LIEBERT MC CONDENSER

AIR COOLED PIPING SCHEMATIC
CONDENSER ABOVE INDOOR UNIT

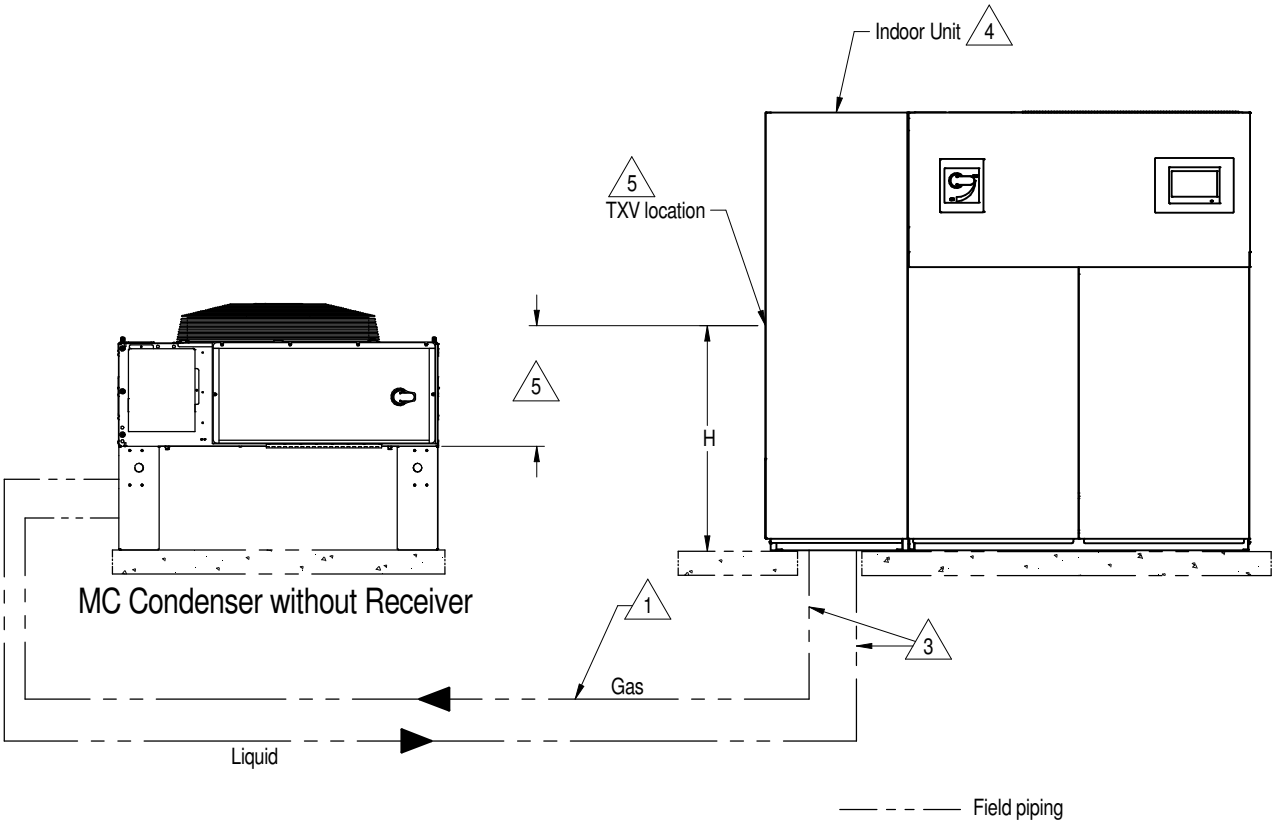


Internal TXV Height	H in. (mm)
~~PDX Downflow~~	~~44 (1118)~~
PDX Upflow	20 (508)
~~DS035-105 Downflow/Upflow~~	~~43 (1092)~~
~~CRV - CR019~~	~~45 (1143)~~
~~CRV - CR020/CR035~~	~~27 (686)~~

VERTIV.

LIEBERT MC CONDENSER

AIR COOLED PIPING SCHEMATIC
CONDENSER AND INDOOR UNIT AT SAME LEVEL



Internal TXV Height	H in. (mm)
~~PDX Downflow~~	~~44 (1118)~~
PDX Upflow	20 (508)
~~DS035-105 Downflow/Upflow~~	~~43 (1092)~~
~~CRV - CR019~~	~~45 (1143)~~
~~CRV - CR020/CR035~~	~~27 (686)~~

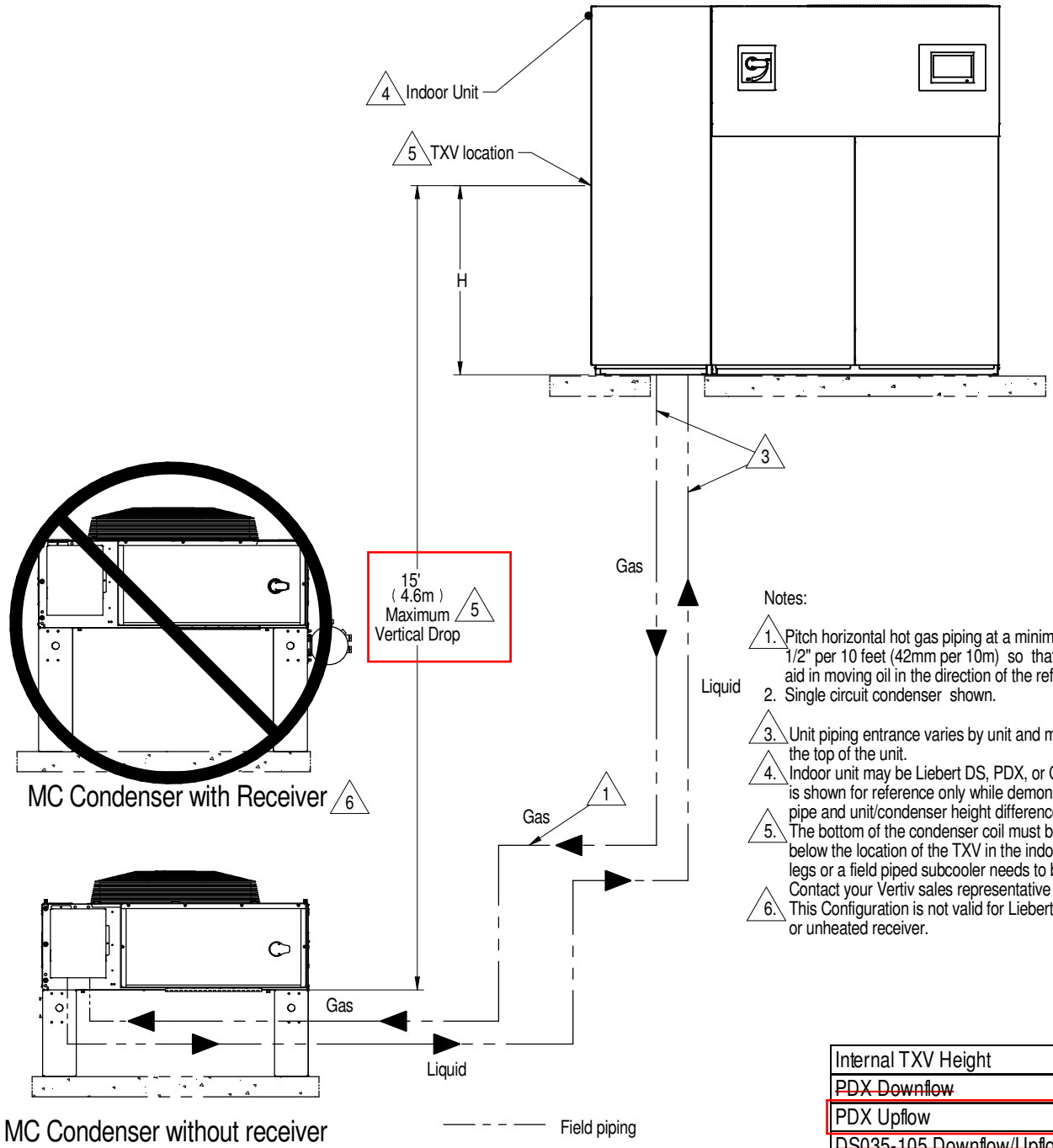
Notes:

1. Pitch horizontal hot gas piping at a minimum of 1/2" per 10 feet (42mm per 10m) so that gravity will aid in moving oil in the direction of the refrigeration flow.
2. Single circuit condenser shown.
3. Unit piping entrance varies by unit and may be through the top of the unit.
4. Indoor unit may be Liebert DS, PDX, or CRV and is shown for reference only.
5. The bottom of the coil must be less than 15' (4.6m) below the elevation of the TXV inside the indoor unit.
   Contact your Vertiv sales representative for additional information.

VERTIV.

LIEBERT MC CONDENSER

AIR COOLED PIPING SCHEMATIC
CONDENSER BELOW INDOOR UNIT



Notes:

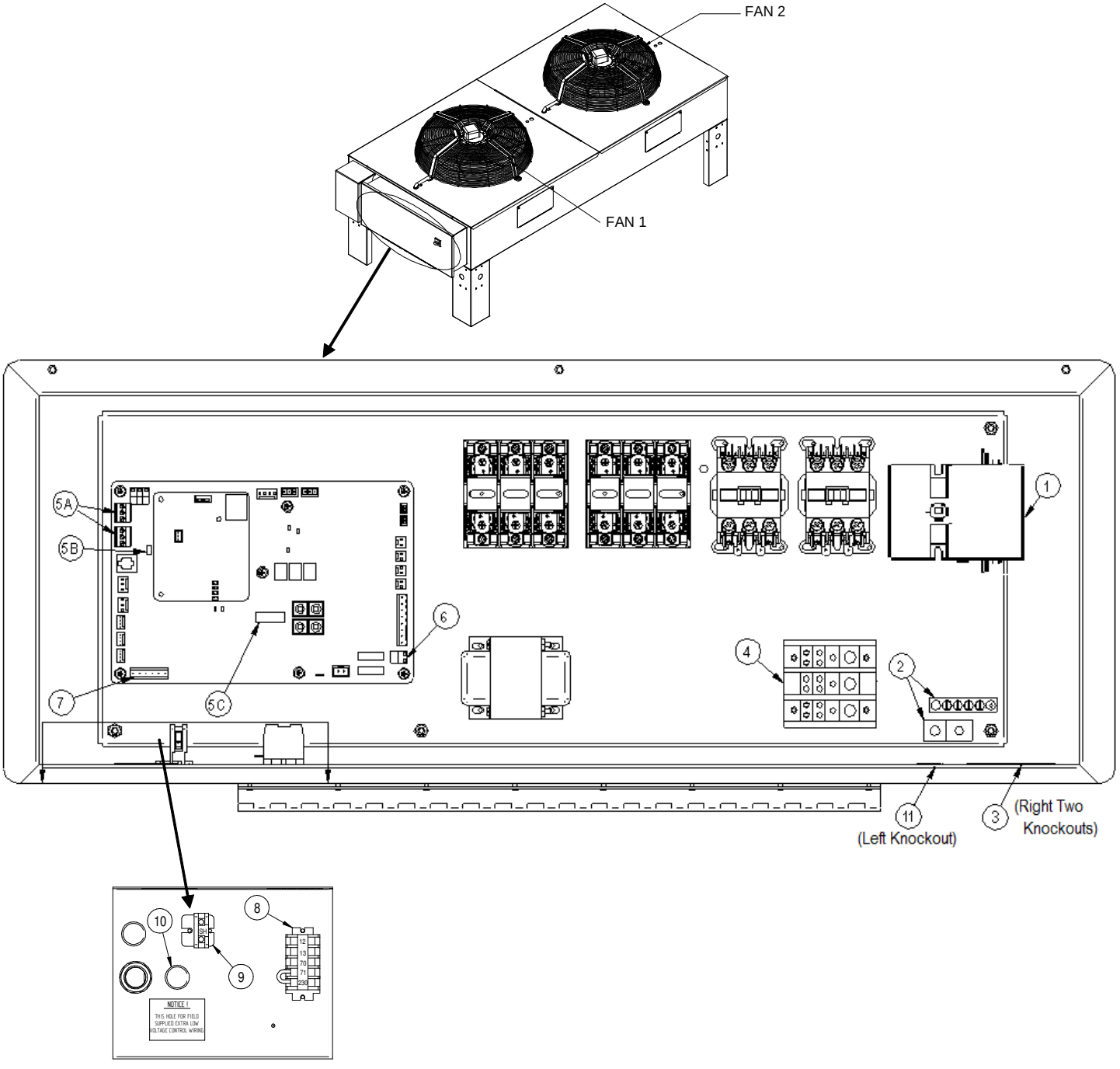
1. Pitch horizontal hot gas piping at a minimum of 1/2" per 10 feet (42mm per 10m) so that gravity will aid in moving oil in the direction of the refrigeration flow.
2. Single circuit condenser shown.
3. Unit piping entrance varies by unit and may be through the top of the unit.
4. Indoor unit may be Liebert DS, PDX, or CRV and is shown for reference only while demonstrating proper pipe and unit/condenser height differences.
5. The bottom of the condenser coil must be less than 15 feet (4.6m) below the location of the TXV in the indoor unit, otherwise extended legs or a field piped subcooler needs to be utilized. Contact your Vertiv sales representative for additional information.
6. This Configuration is not valid for Liebert MC with Lee-Temp or unheated receiver.

Internal TXV Height	H in. (mm)
~~PDX Downflow~~	~~44 (1118)~~
PDX Upflow	20 (508)
~~DS035-105 Downflow/Upflow~~	~~43 (1092)~~
~~CRV - CR019~~	~~45 (1143)~~
~~CRV - CR020/CR035~~	~~27 (686)~~

VERTIV.

LIEBERT MC CONDENSER

ELECTRICAL FIELD CONNECTIONS
PREMIUM EFFICIENCY CONTROL



KEY ELECTRICAL DETAILS:

1) **Three phase electrical service –** Terminals are on top of disconnect switch for one and two fan units. Terminals are on bottom of disconnect switch for three and four fan units. Three phase service not by Liebert. See note 5.
2) **Earth ground –** Field lug terminal for earth ground connection. Ground terminal strip for fan motor ground connection.
3) **Primary high voltage entrance –** Two 7/8" (22.2mm) diameter knockouts located at the bottom of the enclosure.
4) ~~**SPD field connection terminals –** High voltage surge protective device (SPD) terminals. SPD is an optional device.~~

ELECTRICAL FIELD CONNECTIONS
PREMIUM EFFICIENCY CONTROL

5) **CANbus terminal connections –** Field terminals for CANbus cable connection.
- 5A is the CANbus connectors.
  - TB49-1 is the input terminal for CANbus high.
  - TB49-3 is the input terminal for CANbus low.
  - TB50-1 is output terminal for CANbus high.
  - TB50-3 is the output terminal for CANbus low.
  - Each CANbus cable shield is connected to terminal "SH", item 9.
- 5B is the "END OF LINE" jumper.
- 5C is the CANbus "DEVICE ADDRESS DIP SWITCH". CANbus cable not by Liebert. See Note 2. (below)

6) **Remote unit shutdown –** Replace existing jumper between terminals TB38-1 and TB38-2 with field supplied normally closed switch having a minimum 75VA 24VAC rating. Use field supplied Class 1 wiring. (This is an optional feature that may be owner specified.)

7) **Alarm terminal connections –**
   a. Common Alarm Relay indicates when any type of alarm occurs. TB74-1 is common, TB74-2 is normally open, and TB74-3 is normally closed. 1 Amp 24VAC is the maximum load. Use Class 1 field supplied wiring.
   b. Shutdown Alarm Relay indicates when condenser loses power, or when a critical alarm has occurred that shuts down the condenser unit. TB74-4 is common, TB74-5 is normally open, and TB74-6 is normally closed. 1 Amp 24VAC is the maximum load. Use Class 1 field supplied wiring.

8) **Indoor unit interlock and SPD alarm terminals –**
   a. On any call for compressor operation, normally open contact is closed across terminals 70 and 71 for Circuit 1, and normally open contact is closed across terminals 70 and 230 for Circuit 2 from indoor room unit.
   b. ~~During SPD alarm, normally open contact is closed across terminals 12 & 13. SPD is an optional device.~~

9) **CANbus shield terminal –** Terminal for field shield connection of the CANbus field supplied cables. The shield of CANbus field supplied cables must not be connected to ground at the condenser.

10) **Primary low voltage entrance –** One 7/8" (22.2mm) diameter knockout that is free for customer low voltage wiring.

11) ~~**SPD entrance –** One 7/8" (22.2mm) diameter knockout hole located at the bottom of the enclosure. High voltage surge protective device (SPD) is optional.~~

NOTES:

1. Refer to specification sheet for unit voltage rating, full load amp, and wire size amp ratings.
2. The CANbus wiring is field supplied and must be:
   - Braided shield or foil shield with drain wire
   - Shield must be wired to ground at indoor unit
   - 22-18AWG stranded tinned copper
   - Twisted pair (minimum 4 twists per foot)
   - Low Capacitance (15pF/FT or less)
   - Must be rated to meet local codes and conditions
   - EXAMPLES BELDEN 89207 (PLENUM RATED), OR ALPHA WIRE 6454 CATEGORY 5, 5E, OR HIGHER
3. Do not run in same conduit, raceway, or chase as high voltage wiring.
4. For CANbus network lengths greater than 450FT (137M) call Factory.

ELECTRICAL FIELD CONNECTIONS
PREMIUM EFFICIENCY CONTROL

5. All wiring must be sized and selected for insulation case per NEC and other local codes.
6. Do not bend cables to less than four times the diameter of the cable.
7. Do not deform cables when securing in bundles or when hanging them.
8. Avoid running the cables by devices that may introduce noise, such as machines, fluorescent lights, and electronics.
9. Avoid stretching cables.
10. The electrically commutated (EC) motors included in the Liebert MC Condenser are suitable for connection to power supplies with a solidly grounded neutral or high resistance to ground or corner ground.
    a. Acceptable power supplies for 208 to 575V nominal units:
        - 208V wye with solidly grounded neutral and 120V line to ground;
        - 380V wye with solidly grounded neutral and 220V line to ground;
        - 480V wye with solidly grounded neutral and 277V line to ground;
        - 575V wye with solidly grounded neutral and 332V line to ground (uses step-down transformer);
        - Wye with high resistance (or impedance) ground;
        - Delta with corner ground

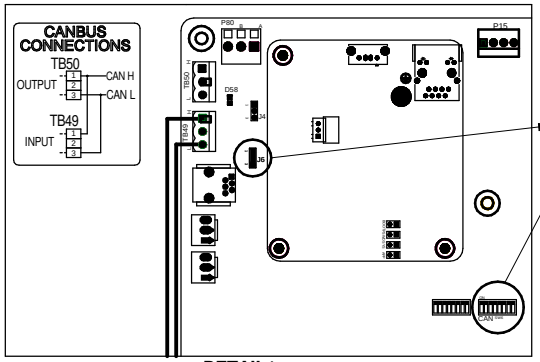
    b. Unacceptable power supplies for 208V to 575V nominal units:
        - Delta without ground or with floating ground;
        - Delta with grounded center tap.

PRELIMINARY SUBMITTAL

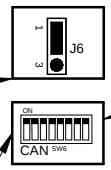
VERTIV.

LIEBERT PDX

CANbus & INTERLOCK CONNECTIONS
BETWEEN PDX UNIT & LIEBERT MC CONDENSER (PREMIUM)



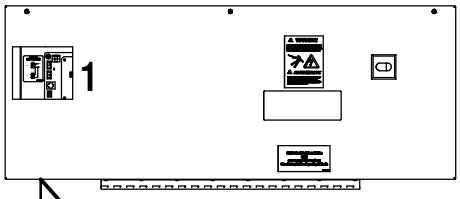
DETAIL1
CAN CABLE CONNECTION (A)

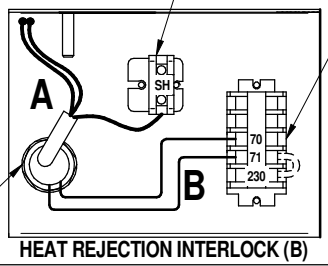


J6 TERMINATION JUMPER MUST BE SET TO PINS 1 AND 2.

CANbus ADDRESSING SWITCH

CONDENSER





SHIELD CONNECTION

FACTORY WIRING BETWEEN MC CONTROL BOARD AND TERMINAL STRIP.

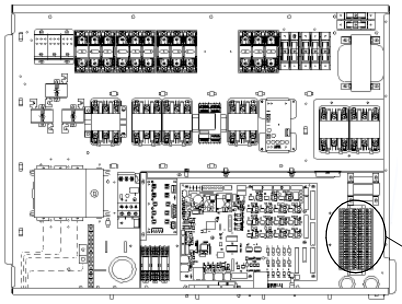
LOW VOLTAGE FIELD ENTRANCE LOCATED ON BOTTOM LEFT OF CONDENSER ENCLOSURE.

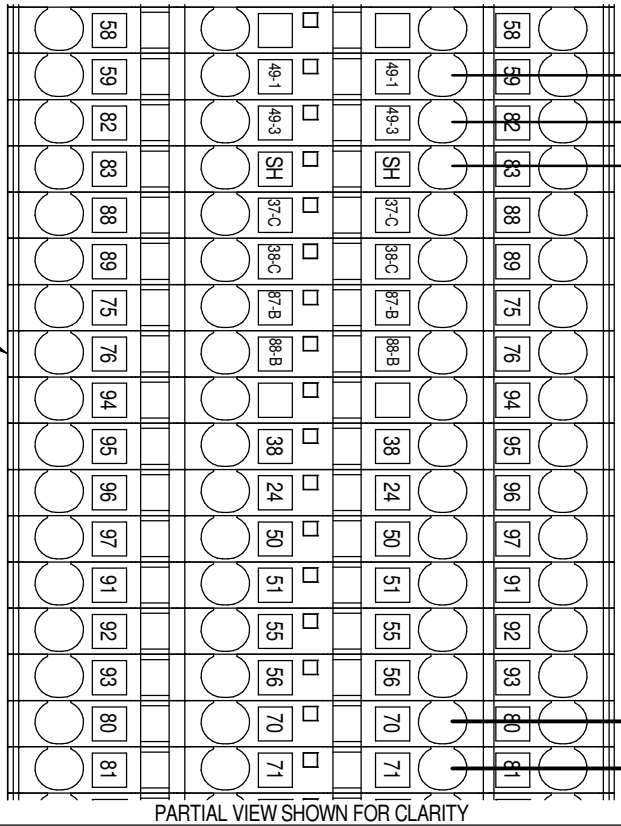
HEAT REJECTION INTERLOCK (B)

A
CANbus CABLE CONNECTION

B
HEAT REJECTION INTERLOCK WIRE

INDOOR UNIT





PARTIAL VIEW SHOWN FOR CLARITY

VERTIV.

LIEBERT PDX

CANbus & INTERLOCK CONNECTIONS
BETWEEN PDX UNIT & LIEBERT MC CONDENSER (PREMIUM)

COMPONENT NOTES:
1. COMPONENT APPEARANCE, ORIENTATION AND POSITIONINGMAY VARY TERMINAL NAMES AND CALLOUTS REMAIN CONSTANT.
2. ALL CIRCUITS TO THESE CONNECTION POINTS ARE CLASS 2.

CAN & CABLE NOTES (A):
1. CABLE MUSTHAVE THE FOLLOWING SPECIFICATIONS:
   - BRAIDED SHIELD OR FOIL SHIELD WITH DRAIN WIRE
   - SHIELD MUST BE WIRED TO GROUND AT INDOOR UNIT
   - 22-18AWG STRANDED TINNED COPPER
   - TWISTED PAIR (MINIMUM 4 TWISTS PER FOOT)
   - LOW CAPACITANCE (15pF/FT OR LESS)
   - MUST BE RATED TO MEET LOCAL CODES AND CONDITIONS.
   - EXAMPLES BELDEN 89207 (PLENUM RATED), OR ALPHA WIRE 6454 CATEGORY 5, 5E, OR HIGHER.
2. DO NOT RUN IN SAME CONDUIT, RACEWAY, OR CHASE AS HIGH VOLTAGE WIRING.
3. FOR CANBUS NETWORK LENGTHS GREATER THAN 450FT(137M), CONTACT FACTORY.

INTERLOCK WIRE NOTES (B):
1. FIELD SUPPLIED WIRE
   - 2 CONDUCTOR 18AWG OR GREATER
   - RATED 600V

2. RUN FIELD SUPPLIED WIRES BETWEEN THE INDOOR UNIT AND THE CONDENSER.