Liebert® CRV DX 10kW

**GUIDE SPECIFICATIONS**

# GENERAL

## Summary

These specifications describe requirements for an environmental control system. The system shall be designed to maintain temperature and relative humidity conditions within the row(s) of racks.

## Design Requirements

The environmental control system shall be a Liebert CRV factory assembled unit. It shall be floor mounted, optimized for maximum cooling capacity in a minimum footprint. The unit shall be UL and AHRI certified.

It shall be specifically designed for service from the front and rear of the unit. The system shall be designed to ensure even air distribution to the entire face area of the coil. Thanks to optional adjustable air supply diffusers, the unit shall be able to mount between the racks or at the end of the row. The unit shall modulate cooling capacity and airflow based on requirements.

CRD100/101 (DX version)

Each system shall be capable of handling up to 1883 SCFM (3200 CMH) with a horizontal airflow pattern. It shall have a net sensible cooling capacity rated no less than 10 kW, based on the entering air condition of 85°F (29.4°C) dry bulb, 32% Relative Humidity, and 95°F (35°C) condensing temperature. These units are to be supplied with 208-230 Volt, 1 phase, 60 Hz power supply of CRD100, with 208-230 Volt, 3 phase, 60Hz of CRD101.

## Submittals

Submittals shall be provided with the proposal and shall include: Dimensional/installation, refrigerant – hydraulic and electrical connections data, refrigerant, and hydraulic circuit’s drawings.

## Warranty

The system shall be provided with a warranty against defects in material and quality.

## Quality Assurance

The specified system shall be factory-tested before shipment and designed to meet UL requirements. The system shall be designed and manufactured according to world-class quality standards. The manufacturer shall be ISO 9001 certified.

# PRODUCT

## COOLING CIRCUITS

The unit shall be equipped with one refrigeration circuit, incorporating DC brushless compressor, evaporator, electronic expansion valve, sight glass, and filter dryer.

The compressor is an R410A double rotor DC inverter-driven type with variable capacity operation from 20%-100%. The compressor has a suction gas-cooled motor, and the system has an automatic reset high-pressure switch, low pressure, and high-pressure transducer, crankcase heater.

The evaporator coil is manufactured from copper tubes and hydrophilic painted aluminum fins, with a galvanized steel condensate drain pan. The evaporator coil has 0.544m2 face area and three rows. The hydrophilic coating provides superior water carryover resistance.

The electronic expansion valve (EEV) is designed for modulating control of the refrigerant mass flow with precision. The EEV simultaneously collects temperature, and pressure signals regulate the refrigerant flow accurately. The wide operating envelope of EEV also lowers down the condensing pressure, thereby resulting in significant energy savings

## Fan section

The unit is equipped with four axial inverter fans, commonly referred to as EC plug fans. The fan speed is variable and automatically regulated by the controller through all modes of operation. The fans pull air through the coil and are located on the front side of the unit.

## Cabinet and Frame

The exterior 1.0mm thick steel panels are custom powder coated to protect against corrosion. The side panels are equipped with 13mm thick insulation. The unit is mounted with leveling feet. The perforated inlet and outlet panels have 74% open area.

## Air Filtration

The unit is equipped with two air filters rated MERV8/G4, located within the cabinet, and accessible from the rear of the unit. A filter clog alarm is available as an option.

## Refrigerant

The unit is suitable for operation with R410A refrigerant.

## Supply Air Baffle System

A field-adjustable, modular supply air baffle system shall be located in the discharge air stream on the front of the cabinet to direct air toward the equipment racks and balance airflow requirements within the row. The modular baffle segments shall be easily reconfigurable to redirect airflow (left, right, or both sides) as cooling requirements change. Controlling the airflow prevents hot spots and maintains high return air temperatures by not blowing cold air over racks or out the ends of aisles. By focusing the cold air where it is needed, and meeting the servers' requirements, the need for excessive air flow and energy consumption is eliminated.

## Serviceability

The cabinet shall be designed so all components are easily accessible for service and maintenance through either the front or rear of the unit. Units that are not fully accessible from front and rear or not serviceable in place shall be unacceptable.

## Unit Controls

### Microprocessor Controller

Liebert CRV models are controlled by the iCOM Edge controller. The controller board is microprocessor-based. It can be programmed to control the function of every device within the unit via I/O.

The controller allows setting and monitoring of the room parameters. The unit utilizes multiple temperature sensors placed at the rack inlet to ensure management and control of temperature by the rack. Each unit should be connected up to 10 Sensors.

The controller allows setting and monitoring of the following space parameters:

* Air inlet Temperature
* Air supply Temperature (remote sensors at rack inlet)
* Return Temperature set-point
* Supply Temperature set-point
* Return Temperature band
* Supply Temperature band
* Humidity (inlet)
* Humidity set-point
* Humidity band
* Rack Min, Max, and Average temperature

The example of available warnings / alarms:

* High supply temperature
* Low supply temperature
* High return temperature
* Air lost
* High return humidity
* Low return humidity
* High exhaust temperature
* High exhaust lock
* Low exhaust temperature
* Low exhaust lock
* High-pressure alarm
* High-pressure lock
* Low-pressure alarm
* Low-pressure lock
* Low-pressure sensor lock
* Water alarm
* Fan alarm
* Reheat alarm
* Humidity alarm
* Filters alarm
* Filters maintain
* Remote alarm
* etc

The following features are incorporated in the controller:

* Status Report of the latest 500 event-messages of the unit
* Input for remote on-off and volt-free contacts for simple remote monitoring of low and high priority alarms: high/low temperature, high/low refrigerant pressure, fan/control failure, compressor/control failure and others are available
* Automatic restart is provided after a power failure

### Display:

LCD Display is 800 × 480 dot colorful touch screen, symbolic representation of unit functions, diagnostics feature. A buzzer provides an audible indication in case of the ‘Warning’ or ‘Alarm’ event.

### Remote Shutdown Terminal

It provides the customer with a location to remotely shut down the unit.

### Common Alarm Contact

It provides the customer with a set of normally open (n/o) contacts for remote indication of unit alarms.

## Monitoring

The unit shall also include a Monitoring Card, it provides an RJ45 port, a Micro-USB port, an RS-485 port and a Liebert sensor-network port.

Use the Web UI to monitor intelligent equipment and the environment through the Web server function provided by the Monitoring card.

Use the network management system (NMS) to monitor intelligent equipment and the environment through the SNMP agent function provided by the Monitoring card.

Use the other equipment and 3rd-party systems to monitor intelligent equipment and the environment through the BACnet IP/BACnet MSTP/Modbus TCP/Modbus RTU/SNMP/YDN23 protocols provided by the Monitoring card.

## Condenser (DX Air cooled version only)

The condenser should be constructed from sturdy aluminum structure body, copper tube, and aluminum fins heat exchanger, axial fan and fan speed controller designed & set for use with R410A refrigerant. The condenser should work from 5°F (-15 °C) to 113°F (+45 °C) ambient temperature, 29.2°F (-34 °C) to 113°F (+45 °C) with Low Ambient Kit. The circuit breaker shall be IP20. The entire unit shall be IPX4 type of protection. The motorized fan shall be IP44, protection class B.

## Additional Features as Standard

### Condensate Pump

A factory installed condensate pump shall be available as an option. It shall have a capacity of 5.8 L/min at 4m head. It shall be a DC brushless pump, having idling protection and overload protection functions.

### Liquid Line Solenoid Kit

Liquid Line Solenoid Kit is a solenoid valve used to prevent refrigerant from condensing into liquid line in condenser and pipe of outdoor when the unit is turned off at the condition of low ambient temperature.

### Remote Temperature Sensor

1 piece of Remote Temperature Sensor is a standard accessory compatible with CRD10 units. Each unit can connect with up to a maximum of 10 pieces of remote temperature sensor.

### Ramp

CRD units shall be removed from the pallet easily with two pieces of ramp, which are as standard accessories in the package.