Liebert®

DataCool™

Heat Removal

# A COOL SOLUTION FOR X-TREME DENSITY COMPUTER AND COMMUNICATIONS FACILITIES


*A Flexible, Scalable And Space-Saving*

*Supplemental Cooling System That*

*Targets Hot Spots Where They Occur*

EMERSON™
Network Power

# MORE HEAT MEANS MORE CHANCES FOR FAILURES

**In today's data centers and communications facilities, you often have to take the good with the bad. Smaller, faster, more powerful equipment is being packed into smaller and smaller spaces. Racks full of 1U size servers are a very efficient, profitable use of space. On the other hand, the heat produced by this high density of equipment can severely tax cooling systems that were perfectly adequate a year or two ago. The result can be thermal overloads and unplanned system shutdowns.**



## New Thinking Delivers A New Solution

- Up until now, total room cooling solutions for data centers — such as precision air conditioning systems — have been more than adequate. But now that single racks can produce significant amounts of heat, there is a need for supplemental cooling to augment the existing room environmental system. And the problem is further intensified because the heat is not evenly distributed within the room...creating hot spots at various locations.
- The key to this challenge was to develop a system that removes heat with a minimal impact on floorspace and has the flexibility to be installed or added to as heat loads increase.

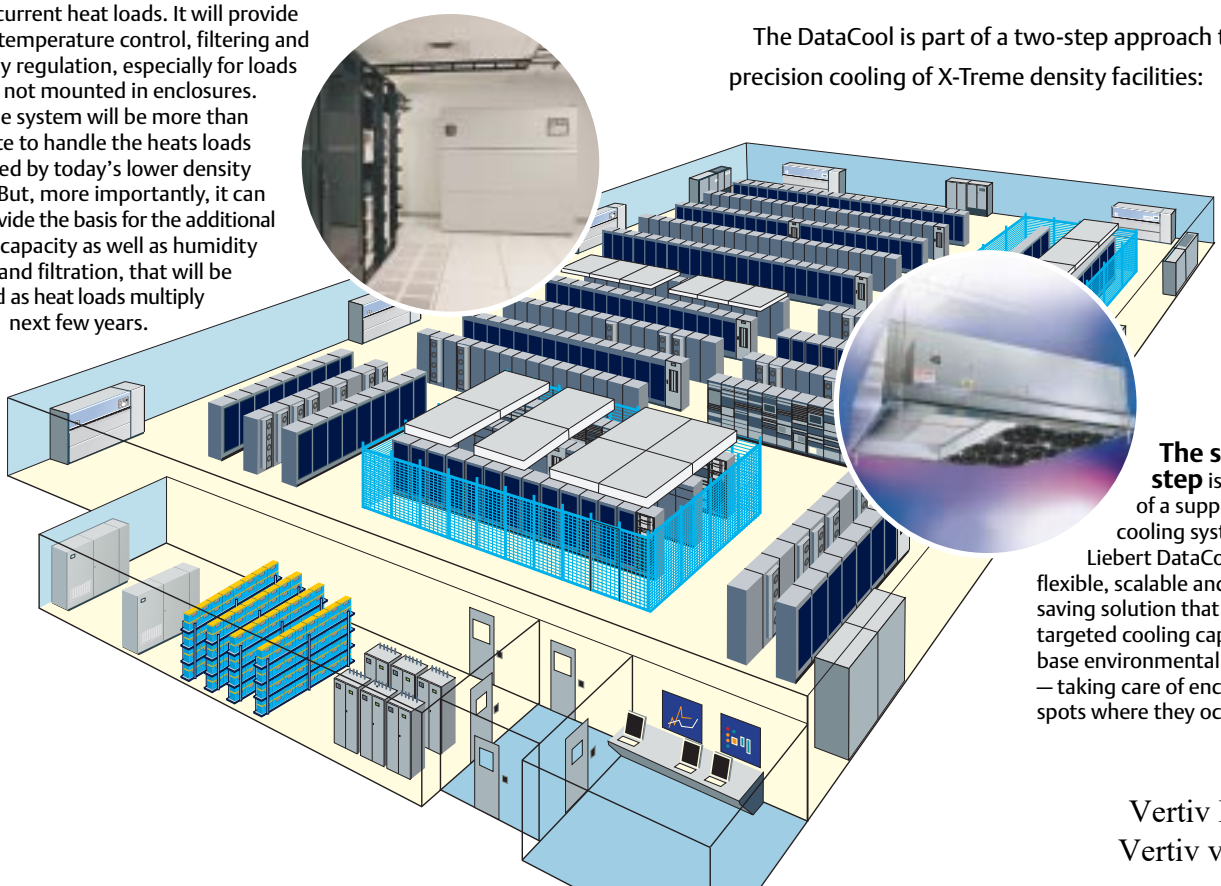
## The Liebert DataCool™

To meet this need, Liebert has developed a solution that removes the heat where it's produced. It's called DataCool™ — a system designed specifically for high density equipment cooling requirements. It can provide cooling capacity for up to 500 watts per square foot heat load areas.

**The first step** is the use of a new or existing, high-capacity precision air conditioning equipment system, such as the Liebert Deluxe System/3, to handle current heat loads. It will provide precise temperature control, filtering and humidity regulation, especially for loads that are not mounted in enclosures. This base system will be more than adequate to handle the heats loads generated by today's lower density rooms. But, more importantly, it can also provide the basis for the additional cooling capacity as well as humidity control and filtration, that will be required as heat loads multiply over the next few years.

## A New Approach To High Density Cooling

The DataCool is part of a two-step approach to precision cooling of X-Treme density facilities:



**The second step** is the addition of a supplemental cooling system, like The Liebert DataCool. It is a flexible, scalable and space-saving solution that adds targeted cooling capacity to the base environmental equipment — taking care of enclosure hot spots where they occur.

# Features That Make The Difference

# DataCool™



**Minimizes Floorspace Requirements**
System modules are mounted overhead — they take up no additional floor space within a data center or equipment room.

**The Liebert DataCool has been engineered from the ground up as a supplemental cooling system designed to solve the specific problem of uneven, high heat loads in specific areas of a room. It incorporates a number of unique product and operating features that make it effective and efficient.**

**Cools At The Source Of Heat**
The DataCool system can be configured and placed to cool high density applications with zones of up to 500 watts per square foot.

**Advanced Monitoring And Control**
The DataCool is monitored and controlled by a microprocessor-based system, which also supports remote monitoring by providing operating information in industry standard protocol.

**Coolant Distribution Unit Prevents Condensation**
To assure that the proper flow of fluid is delivered at the proper temperature and pressure and to isolate the fluid from the main building loop, the DataCool utilizes a coolant distribution unit. This system includes a specially designed fluid temperature management system that keeps fluid temperature above the room's dew point to prevent condensation on the coils.

**Fluid Management System**
This patented system detects a flow disturbance caused by leakage and immediately drains the fluid in the circulation loop.

**Expandable As Your Needs Grow**
The DataCool is designed for flexibility as you add or move equipment. Fans can be added or repositioned to upgrade cooling capabilities.

# THE DATACOOL SYSTEM AND HOW IT WORKS

**Liebert's DataCool utilizes a coolant distribution unit (CDU) in a closed system to distribute fluid through highly efficient fan coils. These coils are essentially heat exchangers equipped with adjustable fans that direct the cooling where required and allow flexibility for changing equipment placement or room configurations.**

**Using multiple fluid circulation loops, each driven by a CDU, fan coils for one circulation loop are interleaved with fan coils from another loop. This enables the system to withstand a failure within one loop — and still maintain cooling with a minimum capacity loss.**

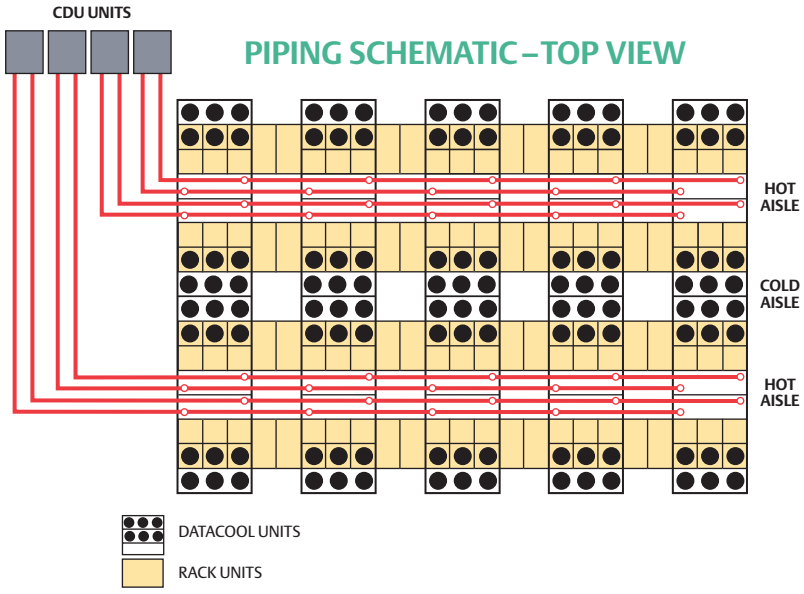
**The CDU is a fault-tolerant system with remote monitoring and alarm capabilities. The unit controls fluid flow and acts as an interface with your building's chilled water system through a heat exchanger. It also senses temperature and relative humidity inside the critical space and holds the fluid temperature in the DataCool's units above the room's dew point to prevent condensation on the coils.**

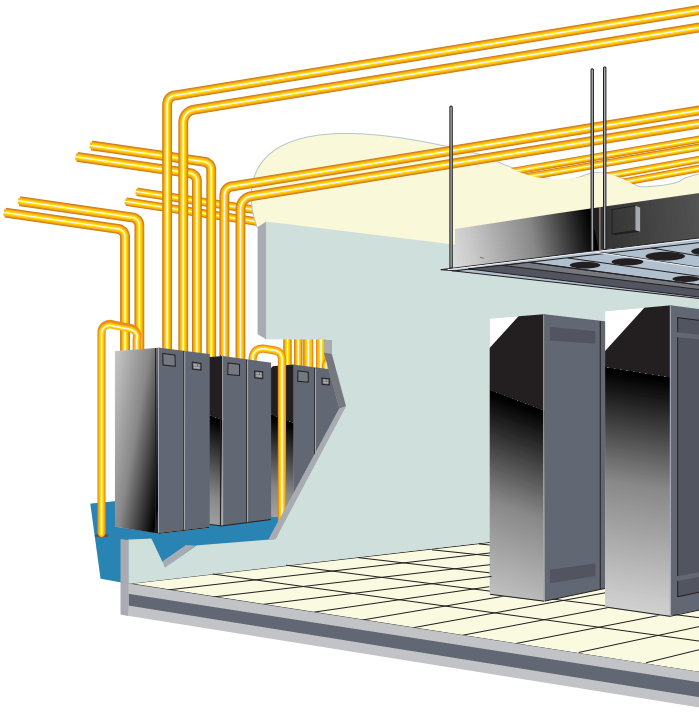
## Built For Reliability

The system is designed with built-in redundancy. A dual pump in the CDU will keep the fluid flowing. If a fan in the cooling unit shuts down, the others keep running. Should other specific out-of-spec conditions occur, including loss of flow, low/high fluid temperature and leak detected, sensors will send a message to your monitoring system.

## Designed For Flexibility

In anticipation of future heat loads, the system is engineered so that you can also install the required fluid piping at minimal cost in advance of adding DataCool units.



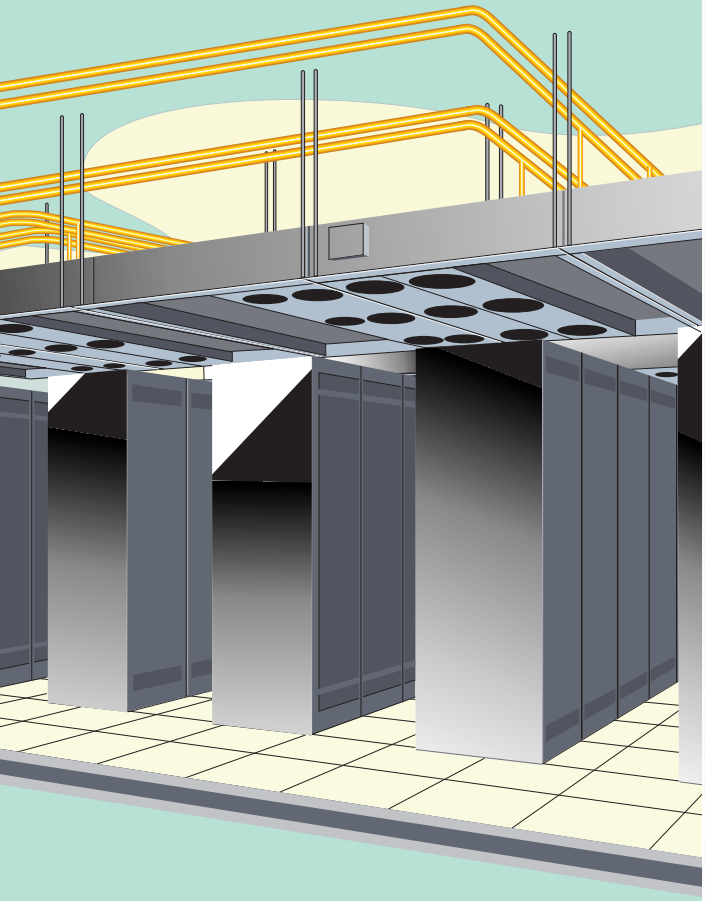



# Coolant Distribution Unit: The Heart of the DataCool System

**The key to the performance and space saving of the Liebert DataCool is the coolant distribution unit (CDU). It is the brains behind this amazingly efficient system.**

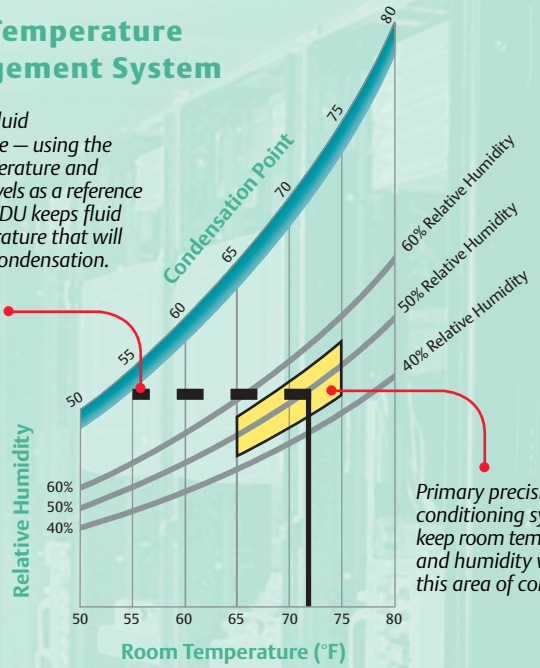
The CDU houses the heat exchanger between the system fluid and building chilled water, the control valve, the dual redundant pumps and the system controls.

In the Liebert tradition of quality, the CDU is designed for maximum efficiency and reliability. One CDU can support 5 DataCool units and would typically be housed in the facility mechanical room.



## Fluid Temperature Management System

*Minimum fluid temperature — using the room temperature and humidity levels as a reference point, the CDU keeps fluid at a temperature that will not cause condensation.*

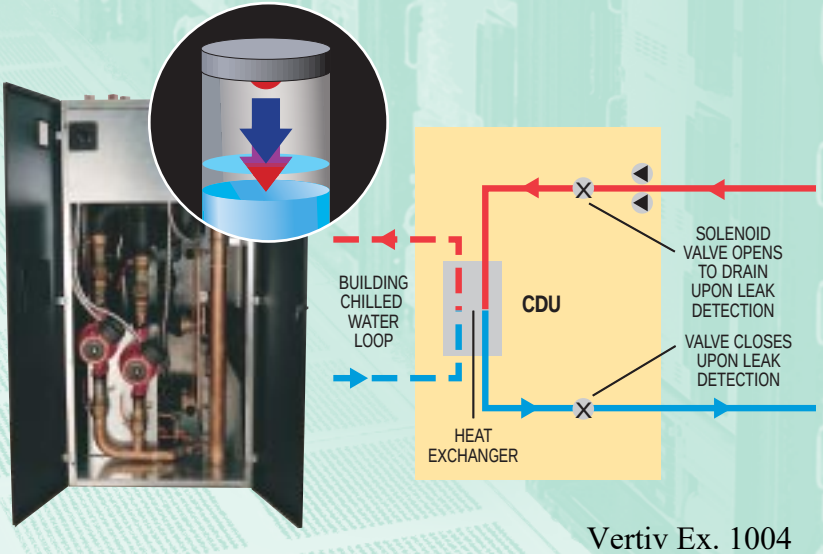



*Primary precision air conditioning systems keep room temperature and humidity within this area of control.*

The CDU precisely controls the fluid temperature according to the room conditions, preventing the forming of condensation on the coils.

## Fluid Management System

System integrity is enhanced by use of a fluid management system. This patented system detects a drop in fluid level caused by leakage and will immediately drain fluid in the circulation loop to prevent leakage. At the same time, an alarm will be sent to your monitoring system, warning you of the situation.



# DATACOOL™ UNIT
# SITE PLANNING DIMENSIONS

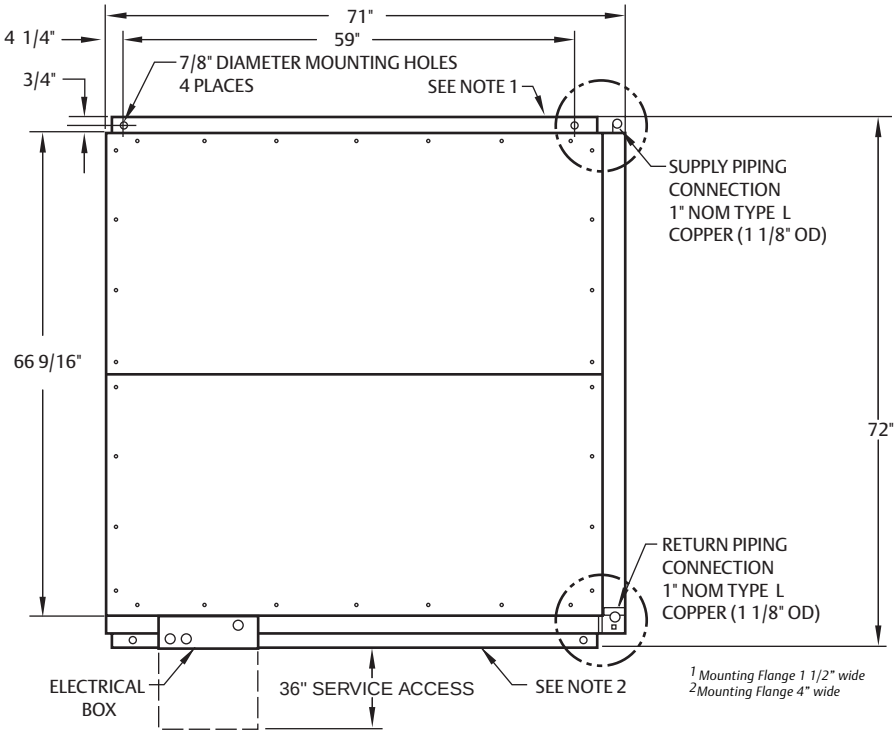
**Rating Conditions**

| | | |
|---|---|---|
| Capacity | 20 kW | |
| Fluid To Load | 55 °F | Supply |
| | 15 gpm | Flow |
| Entering Air Temp. | 85 °F | Typical |
| Weight | 350 lbs. | Installed Filled |

*Ratings with 6 fans running, 60Hz operation, fan trays together*

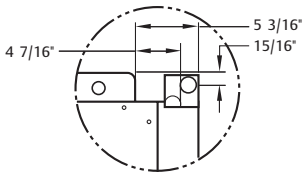
## Fan Configurations

## Top View

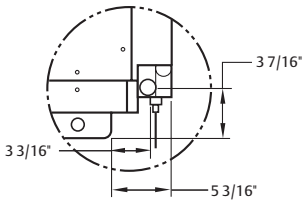



[1] *Mounting Flange 1 1/2" wide*
[2] *Mounting Flange 4" wide*

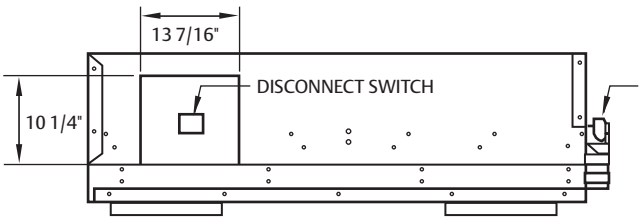
## Detail A

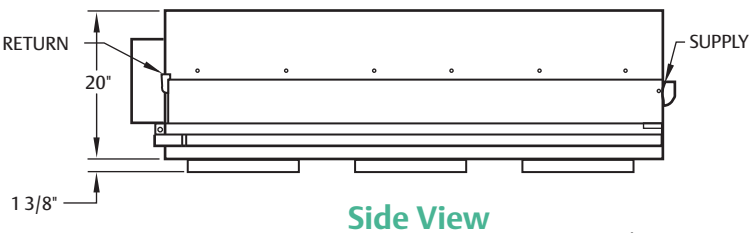



## Detail B



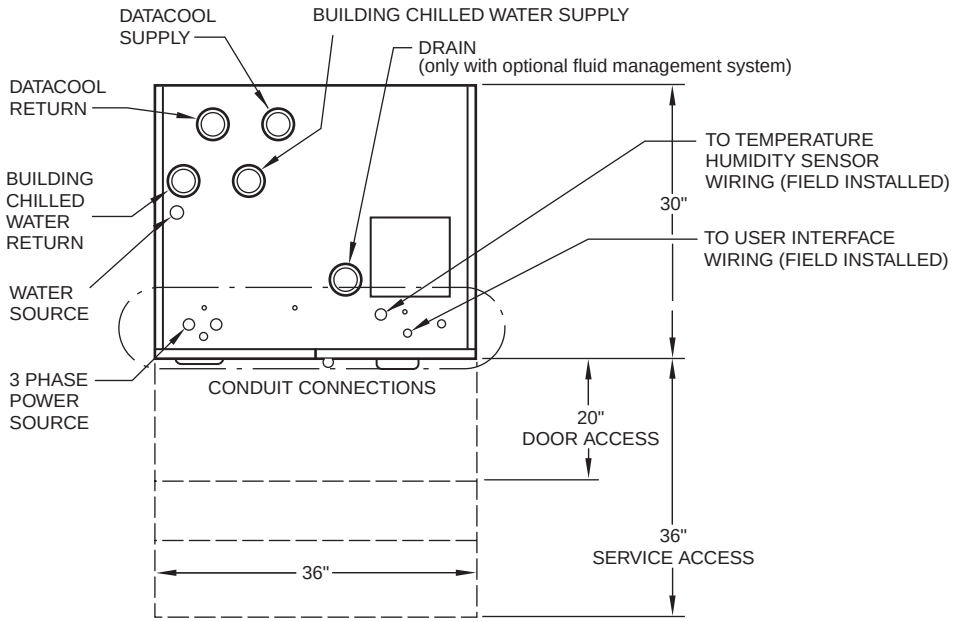

## Front View




## Side View

# Coolant Distribution Unit: Site Planning Dimensions

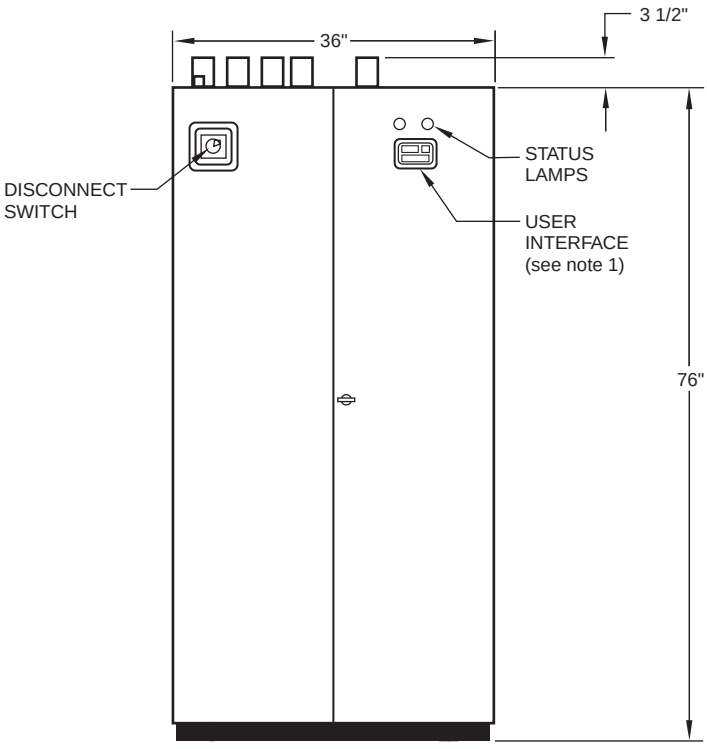


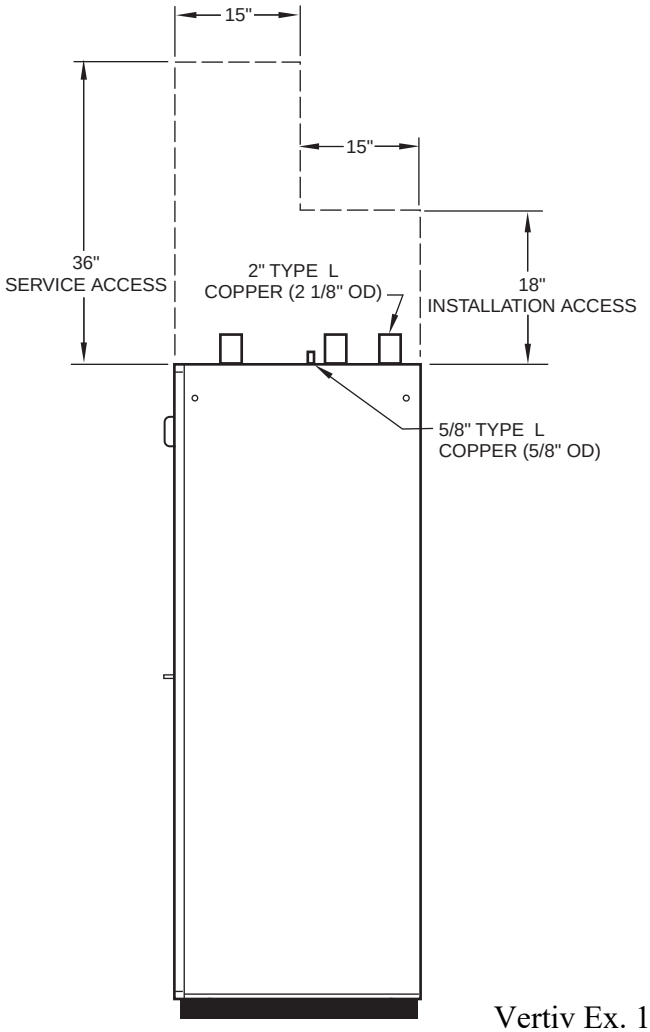

**Rating Conditions**

| | | |
|---|---|---|
| Capacity | 100 kW | |
| Building Chilled Water | 45 °F | Supply |
| | 55 °F | Return |
| | 75 gpm | Flow |
| | 7.0 psi | Pressure Drop |
| Fluid To Load | 55 °F | Supply |
| | 75 gpm | Flow |
| Weight | 1100 lbs. | Installed Filled |

**CDU Electrical Supply** (with 5 DataCool modules)

| Model | Volts | Phase | HZ | Unit FLA | Wire Size Amps | Unit Over-Current Protect. Device Amps |
|---|---|---|---|---|---|---|
| CDU100C-CP00 | 208 | 3 | 60 | 25.6 | 26.7 | 15 |
| CDU100C-AP00 | 460 | 3 | 60 | 12.8 | 13.3 | 15 |




[1] *If the CDU is located outside the conditioned space the user interface must be remotely installed inside the conditioned space.*

# WE HELP YOU GET IT RIGHT — RIGHT FROM THE START.

**DataCool™** | **Heat Removal**

**For over 35 years, Liebert has been providing tailored solutions for protecting the operation of critical electronic systems in a variety of industries. From communications to industrial business networks, we've used our expertise to tailor the right products, site monitoring and global service capabilities into a variety of specific solutions.**

Liebert's years of experience and knowledge of leading edge technologies enables us to truly understand your needs — both in terms of overall reliability and specific areas of equipment protection. Whether it's a new or existing facility, we listen to you and your preferences to help us develop solutions that are right for your application.

We recognize that each situation has its own unique requirements and are better prepared than any other manufacturer to deliver the right level of reliability at the right price. We do this through a combination of knowledge, experience, product selection and service capability.

## Someone Nearby To Help Before And After The Sale

Specifying a high-availability facility support system requires someone who is knowledgeable in all phases of environmental and power protection. Knowing where to turn for ongoing maintenance or service is just as important.

One of the many things that differentiates Liebert from others in our business is local presence. We have the most extensive sales and service network in the world. Liebert's extensive network of technical sales associates, backed by the industry's largest service organization, enables us to respond quickly to customer needs.

ISO 9000 CERTIFIED COMPANY

*Your needs for protecting critical facilities will change many times in the years ahead — Liebert is the one source you can count on for the tailored solutions to meet this challenge.*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