

Precision Cooling  
For Business-Critical Continuity™

## Liebert®: The Right Cooling For IT Environments



## New Challenges To IT System Uptime

**Many IT professionals are finding that dedicated precision cooling is the right solution to provide the ideal environment for sensitive electronics. Dedicated cooling offers the year-round operation, tight temperature and humidity control and air volumes required for optimal performance of IT equipment.**

As IT systems increase in power density, they generate more heat. Building air conditioning systems used for removing heat in IT spaces may no longer be optimal for today's hotter equipment.

Many existing IT spaces have little or no ventilation and insufficient cooling. As a result, lack of sufficient cooling has become a constraint to IT equipment upgrades and expansion.

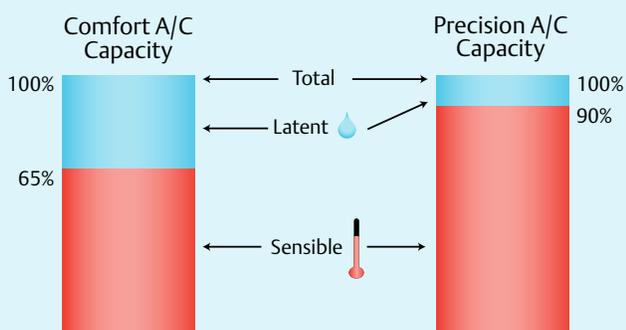
### The Need For Reliable Cooling

Designed for continuous, year-round operation, precision cooling controls temperature and humidity within the tight ranges recommended for IT equipment. This helps to ensure the highest performance of equipment and extends its lifespan.

Precision cooling is cost-competitive against building air conditioning and has a fast payback. Through the use of new technology such as Digital Scroll compressors and high level electronic control systems, precision cooling also does more with less energy than standard building air conditioning.

### The Shortcomings Of Standard Building Air Conditioning

Standard building air conditioning equipment is designed to cool people, spending considerable energy on removing moisture as it removes heat. This can result in air that is too dry for IT equipment, raising the risk of static electricity. Furthermore, building systems are more expensive to operate, requiring more capacity to remove the same amount of dry heat from an IT environment. Precision systems move 40% more air to eliminate hot spots and provide better cooling for IT equipment racks.



### Computers generate heat, but not humidity.

That's why about 95% of a Liebert precision cooling system's energy and capacity are designed to remove the dry heat that electronic equipment produces. Building systems are designed to keep people comfortable and are only capable of using about 60% of their cooling capacity to remove heat generated by computers. The other 40% is used to remove moisture, commonly found in office spaces, but not server or network rooms. This can lower humidity too much in IT equipment rooms, causing static problems and even electronic failures.



## Comparing The Costs Of Cooling Your IT Environment

**While the initial cost of a building air conditioning system may be less than a precision system, comparing the cost of operation reveals a much different story:**

- Comfort cooling systems require the air conditioning equipment and a separate humidifier unit. Liebert precision cooling systems contain both in one unit.
- Precision systems utilize the latest energy saving technology to offer higher efficiency than comfort systems.
- Precision systems are built with heavy-duty components not found in comfort system and are designed to facilitate maintenance when required.
- Precision cooling offers a range of models designed to take up a minimum amount of floor space in data centers and equipment rooms.
- Precision cooling systems are designed for 24 x 7 operation to minimize downtime. Comfort systems are only engineered to operate during business hours.

### Get Quick Payback With Precision Cooling

A precision cooling system produces tangible financial benefits. When a 10-ton precision system was compared with a 15-ton comfort system providing the same level of IT cooling, the precision system saved over \$11,000 in annual costs — providing a 12-month payback for the additional purchase cost of the precision system.

	Annual Cost of Sensible Cooling	Annual Cost to Humidify	Total Annual Cost
<b>Comfort System</b> (15-ton unit)	\$16,902	\$7,688	\$24,590
<b>Precision System</b> (10-ton unit)	\$11,322	\$1,283	\$12,605
<b>Savings</b>	<b>\$5,580</b>	<b>\$6,405</b>	<b>\$11,986</b>

#### Comparison Assumptions for Precision Cooling to Comfort Cooling:

- 500 square foot data center with 32kW of equipment.
- 72° F and 50 percent RH room conditions.
- \$0.10/kW-hr.
- Comfort system costs \$1,878 per sensible ton/year to operate.
- Comfort system removes 1.4kW of latent heat per ton of sensible cooling.
- Precision system costs \$1,258 per sensible ton/year to operate.
- Precision system removes .35kW of latent heat per ton of sensible cooling.



### Case Study

Sequent is a consulting and outsourcing firm located in Columbus, Ohio, helping more than 500 organizations improve corporate performance through the integration of people, strategies, process management and technology.

An increase in the demand for outsourced human resources support placed Sequent at the doorstep of opportunity for achieving significant business growth.

### Critical Needs

Design and implement a new data center that could efficiently meet current requirements while easily scaling to support projected growth. Increase cooling system capacity and performance to ensure even temperatures.

### Solution

A Liebert Challenger 3000 Floor-Mount Precision cooling unit now provides complete environmental control, including temperature, humidity and air filtration. It's a self contained system that fits into seven square feet of corner space which reduced the amount of floor space needed to be kept open. The Liebert Challenger is supported by a ceiling-mounted Liebert Mini-Mate unit to create a redundant precision cooling solution that can handle any failovers.



Brian Donovan, network administrator, Sequent

“Our business is dependent on our IT systems,” says Donovan. “Without our technology, the rest of our business cannot function. Naturally, it is imperative that our systems are up and running as intended so that we can serve our clients at the level they’ve come to expect from Sequent.”

## Why Precision Cooling Makes A Real Difference

Many of today's data centers started out in small spaces with one or two racks and used an existing building air conditioning system to cool the room. As the cooling load increased, however, the comfort systems were not designed to handle the heat of high density racks or operate 24 hours a day, 7 days a week.

In this situation, servers could actually shutdown because of high heat or processors could dial back their performance because of higher temperatures. If you do not control the environment in the space you may not get the performance you expect from the system you are running.

### Maintaining The Right Humidity Is Critical In A Data Center

In comfort cooling, dehumidification is a key element of keeping it comfortable in the space. In data centers, you want to maintain a certain level of humidity--typically around 50% relative humidity--to maintain the proper operation of your servers and IT equipment. To do that you need a cooling system that does less dehumidification and is really more concerned with controlling sensible heat within the data center.

The leading industry organization on HVAC standards, ASHRAE (American Society of Heating, Refrigeration And Air Conditioning Engineers), recommends stable temperature ranges of 64.4 to 80.6°F for data centers. It also recommends controlling humidity levels within a dew point temperature range of 41.9 to 59% to avoid static electricity, another threat to IT equipment. For instance, humidity levels can get very low in the winter, so year-round humidity management is very important.

### Flexibility

- Provides better humidity control compared to standard building air conditioning.
- Units are much easier to adapt to the more efficient "hot aisle/cold aisle" concept of rack cooling.
- Retain existing space with little or no interruption through use of ceiling, wall or corner installed equipment.
- Large range of system installation and cooling methods.

### Availability

- More cooling per nominal capacity at 93% of the rating vs. standard building air conditioning units at 65% of nominal rating.
- Move 40% more air to eliminate hot spots and better cool IT equipment racks.
- Provides much tighter control of temperature and humidity to prevent performance and equipment degradation.
- Low ambient control provides reliable operation during cooler seasons.
- Much higher compressor reliability.
- Designed for 24/7 operation.

### Lowest Total Cost of Ownership

- Local support to ensure that cooling systems are sized for current needs and growth and that they are installed, serviced and maintained without hassle.
- Units are more energy efficient due to better control and better cooling capacity than standard comfort cooling systems.
- Enhances system availability and IT equipment life.

# Liebert Cooling Solutions Are Configured To Meet The Unique Needs Of IT Spaces

## If these cooling related issues are affecting your data center, you need to consider a dedicated cooling system:

- You have difficulty keeping temperatures in the room at or below 78°F before new equipment is installed.
- You have no way to target additional cooling to racks with densities above 5kW.
- You have no way to monitor power and cooling system performance for trending and no way to be alerted to potential problems.
- High heat is limiting the amount of equipment you can place in racks.
- The cost of running a building air conditioning system for your CW IT space has become too high.

### Small Server Rooms, Network Closets, and Small Data Centers

Liebert Datamate™



Liebert MCR



Liebert XDF



Liebert CRV Row-Based Cooling



Liebert Mini-Mate™2

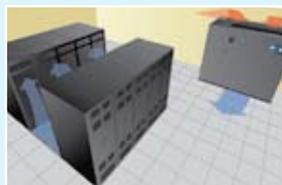


Liebert Challenger with iCOM



### Mid-Large Server Rooms, Data Centers

Liebert DS™



Liebert CW™



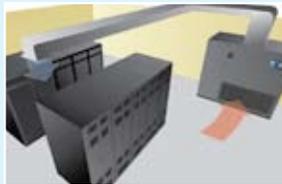
Liebert SmartAisle™



Liebert XD™ Cooling



Liebert DS™ and Liebert CW™ – ducted configurations



## *The Right Cooling Solutions And The Right People To Bring It All Together*

### **Local Support Makes The Real Difference**

In addition to the technological and cost advantages you get with precision cooling, you also will enjoy the support of Emerson Network Power's network of local Liebert Representatives. These power and cooling experts average more than 16 years in the business and can provide an up-front assessment of your cooling needs. They also have important relationships with mechanical engineers and contractors who can help you with installation, startup and maintenance of your cooling system. Your local Liebert Representative will follow the project from start to finish.

We also excel in service after the sale. Liebert Services provides both scheduled preventive maintenance and rapid-response emergency service whenever and wherever it is needed. Liebert Services has the industry's largest coverage with hundreds of Certified Factory Trained Engineers from coast-to-coast. Additionally, the Liebert High Availability Response Center supports customers 24x7 with a staff of knowledgeable people who understand the technology and equipment.



## *No One Knows More About IT Cooling Than Emerson Network Power*

For over 40 years, Liebert brand products from Emerson Network Power have set the standard for critical data center cooling. Our name can be found on hundreds of thousands of products that are protecting mission-critical systems throughout the world. This experience goes into every cooling product we make for every application.

While the size and configurations of data centers have changed significantly over these years, the need to protect them has not. Everything Liebert has learned about cooling critical equipment goes into the products and services we offer for today's data center. You can be sure that the Liebert solution for your IT cooling applications will always be the best solution — and the most cost-effective solution.

For more information, contact your local Liebert Solutions Partner or Liebert Representative.



# Ensuring The High Availability Of Mission-Critical Data And Applications.

Emerson Network Power, the global leader in enabling business-critical continuity, ensures network resiliency and adaptability through a family of technologies — including Liebert power and cooling technologies — that protect and support business-critical systems. Liebert solutions employ an adaptive architecture that responds to changes in criticality, density and capacity. Enterprises benefit from greater IT system availability, operational flexibility, and reduced capital equipment and operating costs.

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- Monitoring
- Outside Plant
- Power Switching & Controls
- Precision Cooling
- Racks & Integrated Cabinets
- Services
- Surge Protection