Liebert® AFC from 500 to 1450 kW
The Adiabatic Freecooling Solution with Top-Tier Availability
**Liebert® AFC, the Ideal Adiabatic Chilled Water Solution for Top-Tier Data Centers**

- **Emerson Network Power** delivers innovative solutions through 12 Centers of Expertise, distinct areas of breakthrough products and services that help determine what is needed in relation to the application. Supported by a global network in more than 150 countries, backed by local service and support from more than 2,000 certified professionals, Emerson Network Power is uniquely positioned to provide systems and integrated solutions wherever our customers are located.

Emerson Network Power understands the challenges of setting up the right infrastructure to support business-critical data center operations and helps respond to any demand by providing innovative solutions, allowing customers to concentrate on their business requirements.

- **Liebert® AFC** combines the outstanding levels of energy efficiency allowed by freecooling together with the endless availability guaranteed by the multi-scroll compressor back up and the highly efficient adiabatic wet pad system. The latter humidifies the air entering the freecooling and condensing coils, consequently increasing freecooling operation and mechanical efficiency. The unit is thus designed to guarantee 100% cooling availability even under the most critical conditions such as fluctuating power supplies, limited water availability and high ambient temperatures.
Optimized Water Consumption

Ultra Silent
Two versions available

Top Energy Efficiency Levels
PPUE down to 1.08

100% Cooling Availability
Even under extreme conditions

Liebert® AFC ... Solves IT All!
Liebert® AFC: One Unit, Three Cooling Technologies

Energy Efficiency

All year round adiabatic freecooling operation and minimized use of compressors deliver the highest efficiency, unreachable by a competitor’s traditional freecooling chiller.

Partial Load

Pure adiabatic freecooling manages 50% load up to 20°C ambient temperature.

NEW iCOM Touch Display 7”

The iCOM® Control ensures the intelligent management of units within the dynamic data center environment, while the innovative 7” touch screen display presents advanced graphic functions.

Supersaver

The Supersaver is the software logic embedded in the iCOM® Control leveraging on the communication with floor mount units to maximize efficiency at system level.

Freecooling

Integrated freecooling modules deliver the cooling load required by the data center without the need of compressors.
Fast Start Ramp

Fast recovery capacity: the unit ensures the re-establishment of the full cooling capacity in 70 seconds, following a power restart. The control remains operative without the need of an external single phase power supply.

Ultra Silent

New generation super silent EC fans combined with the sound barrier provided by the adiabatic pads ensure an extremely silent operation.

Electronic Expansion Valve

Minimized condensing pressure reduces power consumption, thus achieving high efficiency levels.

Microchannel Condensing Coil

The full aluminum coil ensures extreme efficiency levels during the mechanical cooling mode and minimizes the refrigerant charge.

Adiabatic Cooling

Highly efficient adiabatic wet pads humidify air entering the freecooling and condensing coils, thus increasing freecooling operation and mechanical efficiency.

100% Compressor back up

Multiple scroll compressors ensure 100% cooling back up, up to 50°C ambient temperature also in the case of a water shortage.
Data Centers are Heading for New Energy Efficiency Standards, Achievable with Adiabatic Freecooling

Recent market trends have seen an increase in operating temperatures under which new IT equipment operates. This has led to the progress in adiabatic solutions, extending freecooling availability to higher ambient temperatures. Data center designs, in accordance with ASHRAE* guidelines, have accepted to move out of the recommended envelop to the allowable ranges (A1-A4).

With the introduction of the Liebert® AFC adiabatic freecooling chiller, Emerson Network Power meets customer needs, offering a highly efficient solution which maximizes freecooling availability in warmer climates, for longer periods of time and guaranteeing continuous availability even under extreme ambient conditions.

* The American Society of Heating, Refrigerating and Air Conditioning Engineers establishing guidelines relating to HVAC systems.
Emerson Network Power Liebert® AFC has been designed to ensure maximum availability for data centers. A consolidated design and the integration of new technologies have led to the most reliable adiabatic cooler in the market, which provides 100% cooling also during extreme conditions.

- **100% cooling availability under all conditions**
  - **100% cooling at extreme ambient temperatures**
    Liebert® AFC delivers full capacity up to 50° ambient temperature. When the adiabatic system is active, higher temperatures can be reached without affecting the cooling performance.
  
  - **100% cooling guaranteed in 70 seconds, following a power restart**
    Featuring Fast Start Ramp, Liebert® AFC will restore 100% cooling in just 70 seconds, following a power restart and will ensure the unit’s immediate activation. The control, moreover, will keep operating without the need of an external single phase power supply.
  
  - **100% cooling in case of water shortages**
    No need of big water storage tanks, no need to worry about water shortages. The compressors back up system does not require the adiabatic system to be active in order to deliver the full cooling capacity.
Depending upon ambient temperature and humidity, Liebert® AFC constantly optimizes power and water consumption by combining its three embedded technologies: adiabatic, freecooling and mechanical cooling.

All operating modes deliver high levels of efficiency, relying on the triple adiabatic effect of:

- increasing freecooling capacity
- extending freecooling operation to higher ambient temperatures
- increasing mechanical cooling efficiency

Moreover, especially when operating at optimized levels of water temperature such as 26º-20ºC, freecooling will be available up to around 32ºC ambient temperature: all year round.

**All Year Round Adiabatic Freecooling is the Key to Unparalleled Levels of Energy Efficiency**

### Liebert® AFC Operating Modes

**FREECOOLING**
Only fans are needed to operate: direct exchange between water and air.

**ADIABATIC FREECOOLING**
The adiabatic system allows freecooling to operate at higher ambient temperatures.

**HYBRID COOLING**
Adiabatic freecooling is the primary cooling source, multiple scroll compressors are used as back up.

**ADIABATIC MECHANICAL COOLING**
Compressor’s efficiency is increased by the adiabatic system.

**SAFE MODE**
100% availability also during water shortages; the sole mechanical cooling system will guarantee full load.
A New Step Ahead in Energy Savings
The Ideal Solution for Full and Partial Load Applications

Liebert® AFC provides a significant increase in terms of energy savings when compared to any competitor’s most efficient chilled water system available in the market. The graphs below show the operating modes of Liebert® AFC throughout the year and the resulting energy savings compared to a high efficiency freecooling chiller, cooling a 1.4 MW data center located in London.

The advantages of the adiabatic and hybrid designs are even more effective at partial load, where the compressor operation throughout the year is further minimized.

The above graphs and values refer to an application in London with 30% glycol mixture and inlet-outlet liquid temperatures of 26°C-20°C.
The State-of-the-Art iCOM® Control:
Precise, User-Friendly Information at Unit Level

7” TOUCH SCREEN GRAPHIC DISPLAY
- Quick and intuitive.
- Monitors the historical trend of key parameters: efficiency, adiabatic water usage, cooling capacity and temperatures.
- Straightforward visualization of diagnostics.
- Two versions available: installed in the unit or in remote for indoor installations.

The iCOM® Control features three key distinguishing characteristics

Intelligent Energy & Water Management
Monitoring of local temperature and humidity profiles optimizes the unit’s operating costs.

Advanced Logics to enhance Savings
Optimized management of compressors and fans maximizes the hybrid mode usage and efficiency.

Unceasing Control Operation
Fast restoration capacity: 100% cooling available in 70 seconds.
**Perfect Synchronization at Teamwork Level**

The user friendly control exploits the management of energy and water also at teamwork level. The system collects information from the different units’ key parameters and operating modes (adiabatic, freecooling and mechanical cooling) while taking into account water and electricity costs. The control predictively calculates and then implements the combination which optimizes operating costs.

**Utmost Efficiency Even at the Data Center System Level**

When considering the entire data center scenario, involving indoor and outdoor units, the Supersaver becomes the key driver in terms of delivered efficiency at the data center system level. This software logic, embedded in the control, leverages on the LAN communication between all these units. This is to ensure the perfect coordination of the entire system, thus increasing freecooling operation and consequently leading to superior energy savings.
Adiabatic Freecooling Chiller
available from 500 kW to 1450 kW

Liebert® AFC - Adiabatic Freecooling Chiller

<table>
<thead>
<tr>
<th>Model FA0</th>
<th>046</th>
<th>053</th>
<th>059</th>
<th>073</th>
<th>087</th>
<th>102</th>
<th>117</th>
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<td>Cooling capacity kW</td>
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1 Performance data calculated at the following conditions: power supply 400V/3ph/50Hz; coolant inlet/outlet temperature 26/20°C; ethylene glycol 30%.
2 Measured at outdoor temperature of 35 °C; 1 m from the unit; free field conditions; according to ISO 3744.
3 Measured at outdoor temperature of 35°C; calculated according to ISO 3744.

Efficiency at Full and Part Load Condition

- **Ambient Temperature**
  - Madrid
  - London

- **Full capacity also in dry mode**
  - Starts Freecooling

- **EER values**
  - 5.0
  - 7.3
  - 13
  - 23
  - 5.5
  - 5.9
  - 8.1

EER values for the FA0 Range at the following conditions: adiabatic function active (wet pads mode) and calculated according to the average humidity data obtained from Central Europe locations.
**Freecooling Chiller**

available from 500 kW to 1450 kW

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### Efficency at Full and Part Load Condition

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<tr>
<th>Ambient Temperature</th>
<th>Madrid</th>
<th>London</th>
<th>100% LOAD</th>
<th>50% LOAD</th>
<th>25% LOAD</th>
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</thead>
<tbody>
<tr>
<td>35°C</td>
<td>840 hrs/yr</td>
<td>65 hrs/yr</td>
<td>EER 4.1</td>
<td>EER 5.0</td>
<td>EER 4.4</td>
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<tr>
<td>25°C</td>
<td>2220 hrs/yr</td>
<td>1690 hrs/yr</td>
<td>EER 5.1</td>
<td><em>Starts Freecooling</em></td>
<td>EER 5.5</td>
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<tr>
<td>15°C</td>
<td>5700 hrs/yr</td>
<td>7005 hrs/yr</td>
<td>EER 11</td>
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<td><em>Full Freecooling</em></td>
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<tr>
<td>5°C</td>
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<td>EER 11</td>
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<td>EER 32</td>
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</tbody>
</table>

EER values for the FD0 Range
Emerson Network Power

Thermal Management Data Center Infrastructure for Small and Large Applications

**Liebert® HPC**
Wide range of high efficiency Freecooling Chillers from 40 kW to 1600 kW
- Designed specifically for data center applications and to work with SmartAisle™
- Premium energy efficiency version
- iCOM® control featured

**Liebert® PDX - Liebert® PCW**
Liebert PDX available from 15-120 kW
Liebert PCW available from 30-220 kW
- Premium energy efficiency
- Eurovent certified performance
- Unique control capabilities with the iCOM Control

**Liebert® EFC**
Indirect evaporative air freecooling unit
- iCOM control featured
- New generation Liebert® EC Fans
- Eurovent certified heat exchanger

**Trellis™ Platform**
Emerson Network Power’s Trellis platform is a real-time infrastructure optimization platform that enables the unified management of data centre IT and facilities infrastructure. The Trellis platform software can manage capacity, track inventory, plan changes, visualize configurations, analyze and calculate energy usage, and optimize cooling and power equipment as well as enable for virtualization. The Trellis platform monitors the data center, providing a thorough understanding of system dependencies to help IT and facilities organizations keep the data center running at peak performance. This unified and complete solution, delivers the power to see the real situation in your data center, make the right decision and take action with confidence.
**SmartAisle™**
- Aisle containment
- Provides highest energy efficiency
- Works with any Liebert® cooling unit

**Liebert® CRV**
- Row-based high efficiency cooling units available from 10-50 kW in DX and CW versions
- Full airflow and cooling capacity modulation to match server load and to save energy
- Best footprint capacity with the highest efficiency
- Six different control modes to ensure greater flexibility

**Liebert® XD**
- Refrigerant based high density cooling installed close to the server
- Hot spot management for up to 30 kW per rack
- On-demand upgrade with plug and play
- High efficiency and 100% sensible cooling

**Liebert® AFC**
The Adiabatic Freecooling Chiller available from 500-1450 kW
- Integrated adiabatic pad system
- High freecooling capacity
- 100% compressor back up

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**Service**
Emerson Network Power supports entire critical infrastructures with the largest global service organization and an extensive service offering, enhancing network availability and ensuring total peace of mind 24/7. Our approach to servicing critical infrastructure covers all aspects of availability and performance: from single power and thermal management equipment to entire mission-critical systems. The most comprehensive insurance for business protection can be obtained with a service program from Emerson Network Power which includes access to LIFE™.

**LIFE™**
LIFE provides remote diagnostics and preventive monitoring service for UPS and thermal management equipment. LIFE delivers increased uptime and operational efficiency by enabling continuous monitoring of your equipment, expert data analysis and field engineering expertise. Through the data transferred from your equipment via LIFE, our remote service experts gain the real-time insight and information needed to quickly identify, diagnose, and resolve any irregularities that may arise in operation, ultimately taking responsibility for your critical assets 24/7.
Ensuring The High Availability Of Mission-Critical Data And Applications.

About Emerson Network Power

Emerson Network Power, a business of Emerson (NYSE:EMR), is the world’s leading provider of critical infrastructure technologies and life cycle services for information and communications technology systems. With an expansive portfolio of intelligent, rapidly deployable hardware and software solutions for power, thermal and infrastructure management, Emerson Network Power enables efficient, highly-available networks. Learn more at www.EmersonNetworkPower.Asia.

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