LIEBERT® DSE™ THERMAL MANAGEMENT SYSTEM

With Liebert EconoPhase™ Pumped Refrigerant Economizer

The Ideal Solution for California Data Centers

A Highly Efficient, Self-Optimizing Solution for Thermal Management

The Liebert® DSE™ provides industry-leading thermal management efficiency, protection and insight. It uses no water for economization and its innovative design makes it up to 50% more efficient than legacy solutions. Designed with unparalleled expertise, it is part of Emerson's Thermal Management solutions that make your data center as dynamic as your business.

The Liebert DSE solution lets you simplify every aspect of thermal management.

1. **No water usage** and up to 50% thermal energy savings
2. **Auto-economizer control** for maximum energy savings
3. **Optimize intelligently** with Liebert iCOM™ thermal controls
4. **Easily scalable capacity** with modular design and no need for additional chillers, cooling towers or ductwork
5. **Streamline Maintenance** with no use of water, outside air, or manual adjustments

CAN BE USED TO COMPLY WITH TITLE 24, PART 6

Calculated Savings for California Data Centers by the Liebert DSE System, Compared to Water Economizers

The Liebert EconoPhase Pumped Refrigerant Economizer can save an average of **4.3 million gallons** of water annually for California data centers and reduce Time Dependent Value (TDV) of energy by **8% - 10%**.

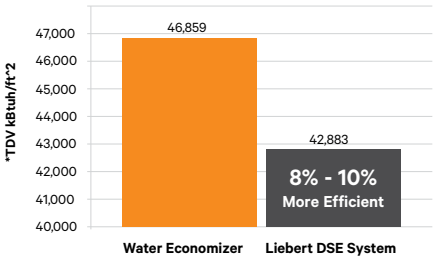
Reliable, Low-Maintenance Pumped Refrigerant Economization Operation

- No water usage
- No water treatment
- No outside air contamination
- No dampers and louvers to maintain
- Automatic switchover to maximize economizer usage
- Lower refrigerant charge than traditional DX systems

Quick Specs

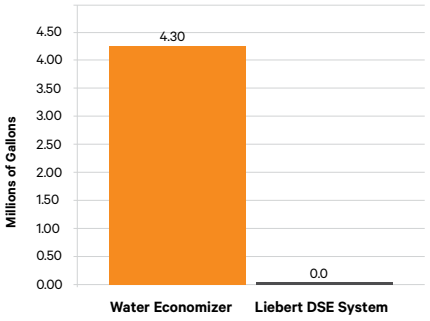
- **MECHANICAL PUE:** 1.3 - 1.05
- **CAPACITY:** 80kW, 85kW, 125kW, 150kW, 165kW
- **FOOTPRINT:** 80-85kW: 24 ft2; 125-165kW: 47 ft2

Average Annual Energy Usage Across California's 16 Climate Zones



*Time Dependent Valuation (TDV) of energy is a measure used by the California Energy Commission that values energy savings according to which hours of the year the savings occur, to better reflect the actual costs of energy.

Average Annual Water Usage Across California's 16 Climate Zones



AHRI CERTIFIED®
www.ahridirectory.org
Datacom Cooling
AHRI Standard 1360

The World's Most Efficient DX System and No Water Usage

The air-cooled Liebert® DSE™ offers water-free economization, a rapidly deployable configuration and advanced Liebert iCOM™ thermal controls that let you optimize each unit and harmonize the operation of multiple units for temperature and airflow.

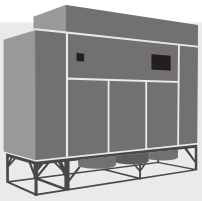
A highly scalable and modular solution, it easily accommodates changing IT loads and is ideal for upgrading outdated or inefficient cooling systems.

Optimization Through Intelligent Controls

The Liebert DSE system has four components that work together to optimize the use of ambient temperatures for higher efficiency and to ensure higher protection of the thermal system. It provides fail-safe economization with full DX backup.

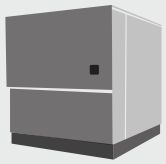
The hardware components are managed by the Liebert iCOM unit control which is integrated into the CRAC unit.

An optional capacitive buffer provides continuous control operation during power outages of up to 3 minutes. Continuous operation of controls allows for monitoring systems to remain active, and allows for faster restart times after power is restored.

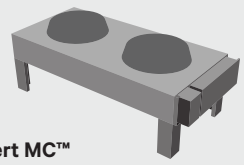


The **Liebert DSE**
indoor computer room air conditioning (CRAC) unit
World's most efficient DX cooling system

Liebert iCOM Thermal System Controls
Intelligence for optimized operation



The **Liebert EconoPhase™**
pumped refrigerant economizer
Economization without hassles



The Liebert MC™
micro-channel condenser
Intelligent, high efficiency condensers

COMPONENTS

Liebert Indoor Unit

- Industry-best efficiency
- Digital scroll compressors match cooling to IT load
- EC plugs fans match airflow to IT server needs
- Electronic expansion valves

Liebert MC Condenser

- Most efficient air-cooled condenser for data centers
- Fan/Coil operating strategy increases part load efficiency
- Each fan is variable speed

Liebert iCOM Controls

- Protection from adverse events and system wear and tear
- Higher efficiency across the thermal system – up to 50% energy savings
- Insight for action into real-time data and trends for performance optimization

Liebert EconoPhase

- Integrated economizer control with automatic diagnostics
- Liebert iCOM monitoring of pump operation
- Automatic changeover on loss of free cooling
- Pump serviceable without loss of cooling

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