

# Liebert® EconoPhase

Pumped Refrigerant Economizer



## Liebert® EconoPhase

At Vertiv we believe that being mindful of product design, development, use, and disposal are important to the longevity of our industry.

### Checkout these environmentally conscious features of the Liebert® EconoPhase:

- Active Refrigerant Economizer offers better control and reliability than passive thermosyphon systems
- Pumps use less than one-tenth of a energy CRAC compressors
- Refrigerant carries twice as much heat as water and 40 times as much heat as air
- Instant changeover to economizer mode, even for short periods, to maximize efficiency

## Additional Benefits

### Greater Protection

- No outside air contamination, and no dampers or louvers to maintain
- Automatic failure diagnostics; pump unit serviceable without loss of cooling

### Low Maintenance

- Virtually maintenance-free, with no moving parts except the sealed pumps

### Easy to Install

- Allows for greater lines lengths and more flexibility than passive thermosyphon systems (up to 300 ft)

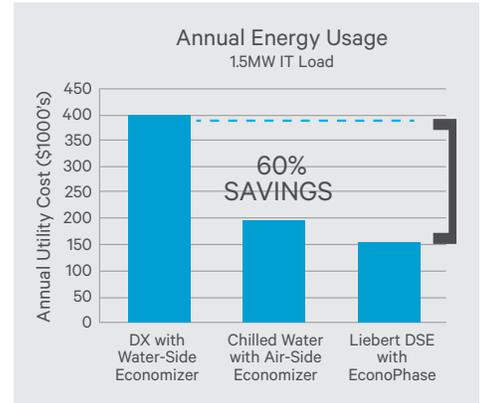
## Highly Efficient, Water-Free Economization

The Liebert® EconoPhase Pumped Refrigerant Economizer has changed the face of data center cooling by providing high efficiency cooling without using water. The first pumped refrigerant economizer for data centers, this innovative technology is installed in more than 6000 locations worldwide. It offers significant advantages over passive thermosyphon systems.

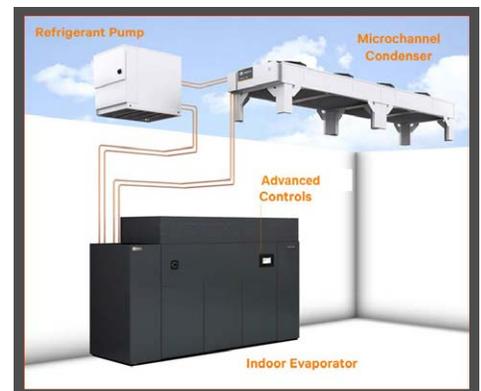
The economizer is a critical part of the Liebert® DSE system, working with the indoor evaporator and Liebert® MC or MCV Outdoor Condensers to significantly improve data center efficiency —without bringing in outside air and without using water.

### How It Works

Liebert® EconoPhase operates as part of the Liebert® DSE Free-Cooling Economization Solution to reduce compressor usage. All of the system's main components — compressors, condenser fans, CRAC fans and refrigerant pumps – are coordinated by its Liebert® iCOM™ controls. These controls automatically move the system between full economization, partial economization and full compressor phases, based on IT loads, return air temperatures and outdoor temperatures, maximizing the use of available economization hours. In cold temperatures, iCOM™ deactivates the compressors and activates the economizer pumps which move refrigerant at a fraction of the energy usage. During the hottest temperatures, compressors are activated, bypassing the economizer pumps. In moderate temperatures — fall, spring or even during the night - iCOM may activate one compressor and one refrigerant pump to gain partial economization and energy savings.



Cutaway view of EconoPhase pumps and piping



**COMPARING HEAT REJECTION EFFICIENCIES**

	Refrigerant v Air	Refrigerant v Water
Heat Density of Fluid	6931 btu/ft <sup>3</sup> v 0.5 btu/ft <sup>3</sup>	6831 btu/ft <sup>3</sup> v 3445 btu/ft <sup>3</sup>
Heat Removal Coefficient Performance (COP)	1188 kW/kW v 29.5 kW/kW	1188 kW/kW v
Increase in Heat Removal Efficiency Compared to Air	+4023%	+2000 %

Refrigerant carries 2 times as much heat as water and 40 times as much heat as air.

**Liebert® DSE Pumped Refrigerant Economization By City**

