Solutions
For *Business-Critical Continuity™*

# Smart Solutions Reference Summary

## 1100kW Tier 4 With High Efficiency Refrigerant Economization

**SmartDesign™**

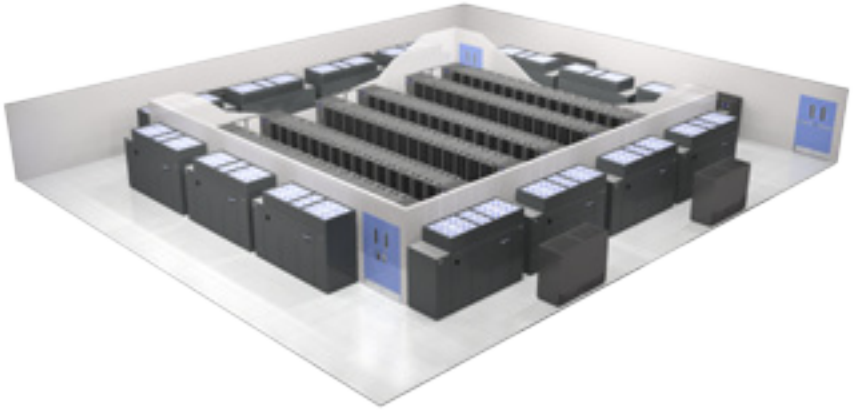
Intelligent, Integrated Infrastructure
for the Data Center

The SmartDesign from Emerson Network Power uses a perimeter/room-based approach to deliver efficiency, availability, capacity and control, that allows you to be prepared for what's next.

This Reference Summary, Tier 4 With High Efficiency Refrigerant Economization, provides one example of how a SmartDesign solution can be developed to solve the challenges presented in new and renovated facilities. Please refer to our website www.SmartSolutionsDesigns.com for more Scenario Reference Summaries.

### *Customer Benefits:**

- Reduces rack count by 43%
- Lowers energy costs by $181K per year
- Saves 62% in OPEX
- Obtain a system PUE of 1.19
- Ensures maximum uptime for Tier 4 and avoids major outages that can cost $500K per event
- UPS operates at 97% efficiency, 80% time
- Lowers installation cost, improves scalability



### SmartDesign Summary: Tier 4 With High Efficiency Refrigerant Economization

| | |
|---|---|
| Current Capacity: | **1100kW** |
| Tier: | **4, Dual bus** |
| Typical Racks: | **50-250** |
| This Design: | **90 racks** |
| Density Range: | **5-15kW/rack** |
| This Design: | **12kW/rack** |
| Containment: | **Partial, doors only** |

### Overcome the challenges with the SmartDesign approach and be prepared for what's next:

- Reliable, flexible power and cooling solutions deliver efficiency, scalability and availability
- Effective monitoring, management and control
- Efficient space utilization
- Improved PUE
- Lower TCO
- Flexible configurations

### Current Technology Configuration:

- (14) Liebert DSE 125kW DX Cooling Unit
- Pumped Refrigerant Economizer
- (90) DCF Optimized Racks
- 2 (4x400kVA) Liebert NXL 400kVA UPS Dual Bus
- (12) Liebert PPC PDU
- (12) Liebert FDC PDU
- (112) Liebert MPX Rack PDU
- Intelligent Cold Aisle Containment
- (2) Liebert TVSS
- (2) ASCO ATS
- Liebert Nform, Avocent Data Center Planner
- 24x7 support

EMERSON™
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# Technologies Configured to Improve Data Center Performance

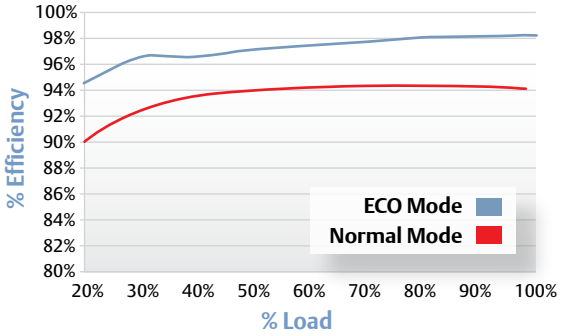
| Technologies | Benefits |
|---|---|
| Liebert DSE 125kW Cooling | Industry leading efficiency is obtained using EC fans, tandem digital scroll compressors, advanced controls, staged evaporator coil, electronic expansion valves and EconoPhase. Offers reliable high capacity cooling in an innovative, scalable system. |
| Liebert iCOM Controls | Advanced controls ensure superb efficiency through teamwork, seperate fan and capacity control, unit rotation and more. |
| EC Fans | Improved airflow performance and efficiency. Energy savings of 20-30% over traditional designs. |
| Liebert EconoPhase | This patent pending option uses efficient pumped refrigerant to deliver free cooling loops during appropriate climate conditions. |
| Intelligent Cold Aisle Containment | Improved air management, energy efficiency and capacity. In this design we deploy partial containment with doors but no roof while leveraging Liebert iCOM control. |
| Liebert NXL 400kVA 2N dual bus | Robust and efficient double conversion UPS. Resilient stack-up performance protects from all electrical conditions. Efficiency rivals transformer-free systems. Power factor rated at near unity. |
| Liebert PPC | Reliable and flexible isolated power conditioning and distribution delivers significant power to numerous circuits. |
| Liebert FDC | Flexible, fast, in row power distribution for high capacity connections to the racks. |
| Liebert MPX Rack PDU | Intelligent rack power distribution creates a very smart, scalable and flexible system. Hot, swappable modules, receptacle level control and management. Single or three phase. Flexible mounting. |
| Liebert TVSS | Facility-wide and Panel Mount versions remove electrical surges in the power stream. |
| ASCO ATS | Reliable switching for critical performance. |
| Infrastructure Management | Alber Battery Monitoring: identifies issues in batteries and extends product lifespan.<br><br>Liebert Nform: Distributed monitoring and alarm management of critical devices. Increases availability.<br><br>Avocent Data Center Planner manages assets capacities and room/rack layouts. |

## Performance (This Design vs. Base)

| Benefits | Savings Over Base | Advantage Percent |
|---|---|---|
| Annual Energy Cost | $181,500 | 62% |
| 5 Yr OPex | $907,500 | 62% |
| 5 Yr TCO | $3.5MM | 18% |
| PUE | Reduced from 1.40 to 1.19 | |

* Columbus, Oh weather table. Comparable base uses (20) CW 84kW using standard fans in chiller plant with fluid economization and (4) 750kVA UPS with no eco-mode operation. Capex includes building, fire suppression and engineering costs.

## Energy Efficient Power Stream

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- AC Power
- Connectivity
- DC Power
- Embedded Computing
- Embedded Power
- Industrial Power
- Infrastructure Management & Monitoring
- Outside Plant
- Power Switching & Controls
- Precision Cooling
- Racks & Integrated Cabinets
- Services

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***For more details on this or other SmartDesign solutions, please contact your local Emerson Network Power data center infrastructure specialist. Find them on the web or call 800.222.5877 (option 4).***
***See more scenario references at: www.SmartSolutionsDesigns.com.***