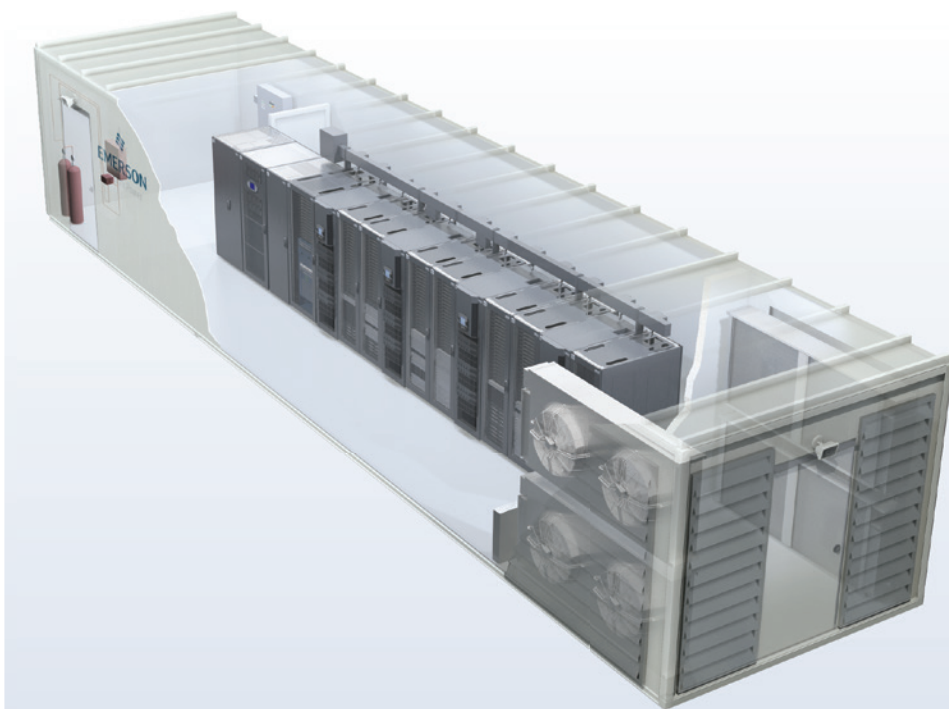


*SmartMod™*

Intelligent, Integrated Infrastructure for the Data Center





## Deploy a High-Capacity, Efficient and Secure Infrastructure in Just Months

### Building a new data center in a short timeframe is nearly impossible.

The SmartMod™ infrastructure from Emerson Network Power provides enhanced levels of availability, efficiency and control in self-contained enclosures that can be deployed securely, virtually anywhere.

With the SmartMod solution, you get an effective alternative to traditional data centers, which gives you cost-savings, operational efficiency and the highest levels of availability - implemented in just months.

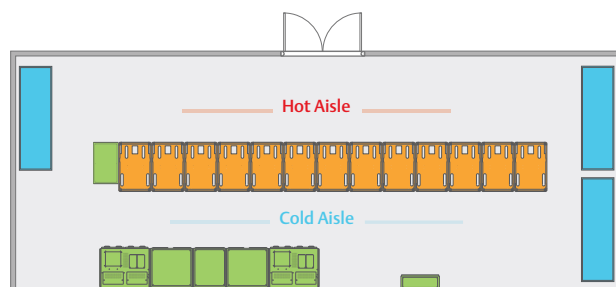
The SmartMod infrastructure is ideally suited for:

- Supplemental data center capacity
- Disaster recovery
- Remote data centers

With the SmartMod solution, Emerson Network Power has demonstrated CAPEX savings of about 8 percent AND OPEX savings of about 29 percent, as well as:

- Tested as a system, minimizing commissioning and deployment time. Full testing reports are provided

### Compare the Costs of a Conventional Data Center Design Versus the SmartMod Infrastructure Solution



#### Conventional

<b>Number of Racks</b>	13
<b>Density</b>	5.77
<b>Total IT Load</b>	75 kW
<b>Cooling units</b>	3 x 20 ton Precision Cooling systems units
<b>Power</b>	2 100kVA UPS systems with Battery Modules Distribution panel
<b>Heat Rejection Equipment</b>	External Condensers

- Fire suppression canister
- Racks and Integrated Cabinets
- Transfer switches
- Condensing Units
- Precision Cooling (DX configurations shown. Chilled Water configurations also available)
- AC Power

	Conventional Data Center Design	SmartMod 8-Rack, 75kW, N+1	Cost Savings	Advantage SmartMod
<b>Room Costs</b>	\$579,000	\$84,000	\$495,000	85%
<b>Infrastructure Costs</b>	\$315,000	\$772,000	-\$457,000	-145%
<b>Total Capital Expense</b>	\$894,000	\$856,000	\$38,000	4%
<b>Energy Consumption</b>	\$31,000	\$22,000	\$9,000	29%
<b>5 Year OpEx</b>	\$155,000	\$110,000	\$45,000	29%
<b>5 Year TCO</b>	\$1,049,000	\$966,000	\$83,000	8%

**Room Savings:** Pre-engineered, integrated enclosure eliminates need for new facility and reduces planning and on-site costs.

**Equipment Savings:** SmartMod enclosure cost includes data center space and infrastructure; cost more than offset by other savings.

**Energy Savings:** Airflow management, EC fans, digital scroll, intelligent cooling controls, no chilled water.



## What Makes the SmartMod™ Offering Unique?

Imagine the advantages of a rapidly deployable, standalone data center with all the capabilities you need to achieve your IT objectives.

The SmartMod infrastructure utilizes the following data center and technology best practices to deliver results in efficiency, availability and capacity:

- Maximizes the return temperature at the cooling units to improve capacity and efficiency
- Matches cooling capacity with IT load
- Utilizes cooling design that reduces energy consumption
- Uses power management systems that optimize availability and efficiency
- Features a design that enhances flexibility using scalable architectures that minimize footprint
- Utilizes real-time infrastructure optimization to provision resources faster, increase efficiency and reduce stranded capacity
- Leverages the availability of in-market data center design expertise and technical assistance

### *Efficient*

- **Reduce power consumption** by up to 28% compared to conventional data center design
- **Reduce maintenance costs** through an efficient design that reduces wear and tear and requires less servicing
- **Install and service components** without disrupting the main data center or integrated systems
- **Easily access for servicing** with the 11.5-foot width which provides more work space

### *Economical*

- **Reduce time and cost** of deployment due to pre-engineered design; order, install and implement within just months
- **Avoid the costs and hassles** of data center expansion and construction by adding stand-alone capacity and space as needed
- **Deploy without burdening your existing power and cooling infrastructure**

### *Simplified*

- **Rapidly deploy** through a pre-engineered, integrated infrastructure
- **Ensure continuity of business** operations with single system startup, warranty, preventive maintenance and repair
- **Utilize industry-leading service** and support provided by local data center design experts who can help implement the solution as a standalone data center or integrated with existing facilities

### *Controllable*

- **Comprehensively monitor and manage** each connected device to ensure efficiency and availability, and evaluate how potential adjustments might affect performance
- **Ensure efficiency and availability** with Liebert® iCOM® controls — manage cooling to optimize IT equipment performance and life
- **Enhance performance** and anticipate potential problems before they occur with Avocent® infrastructure monitoring and management appliances and software
- **Increase physical security** and equipment protection with lockable cabinets, mounted video cameras and access alerts; incoming power is not exposed

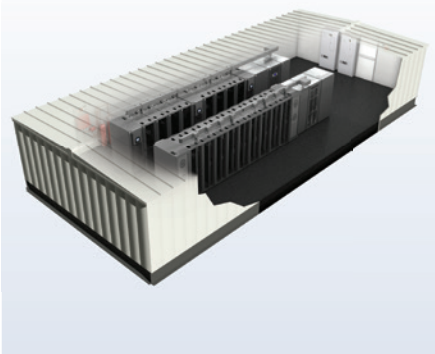
## SmartMod™ Enclosure: Efficient Technologies Provide a Reliable, Innovative Solution

### Get the industry's leading physical infrastructure in a rapid-deployment enclosure.

The SmartMod enclosure comes in configurations to support a range of capacity needs. Multiple power and precision cooling options within each configuration let you customize it for redundancy levels, types of heat rejection and other requirements.

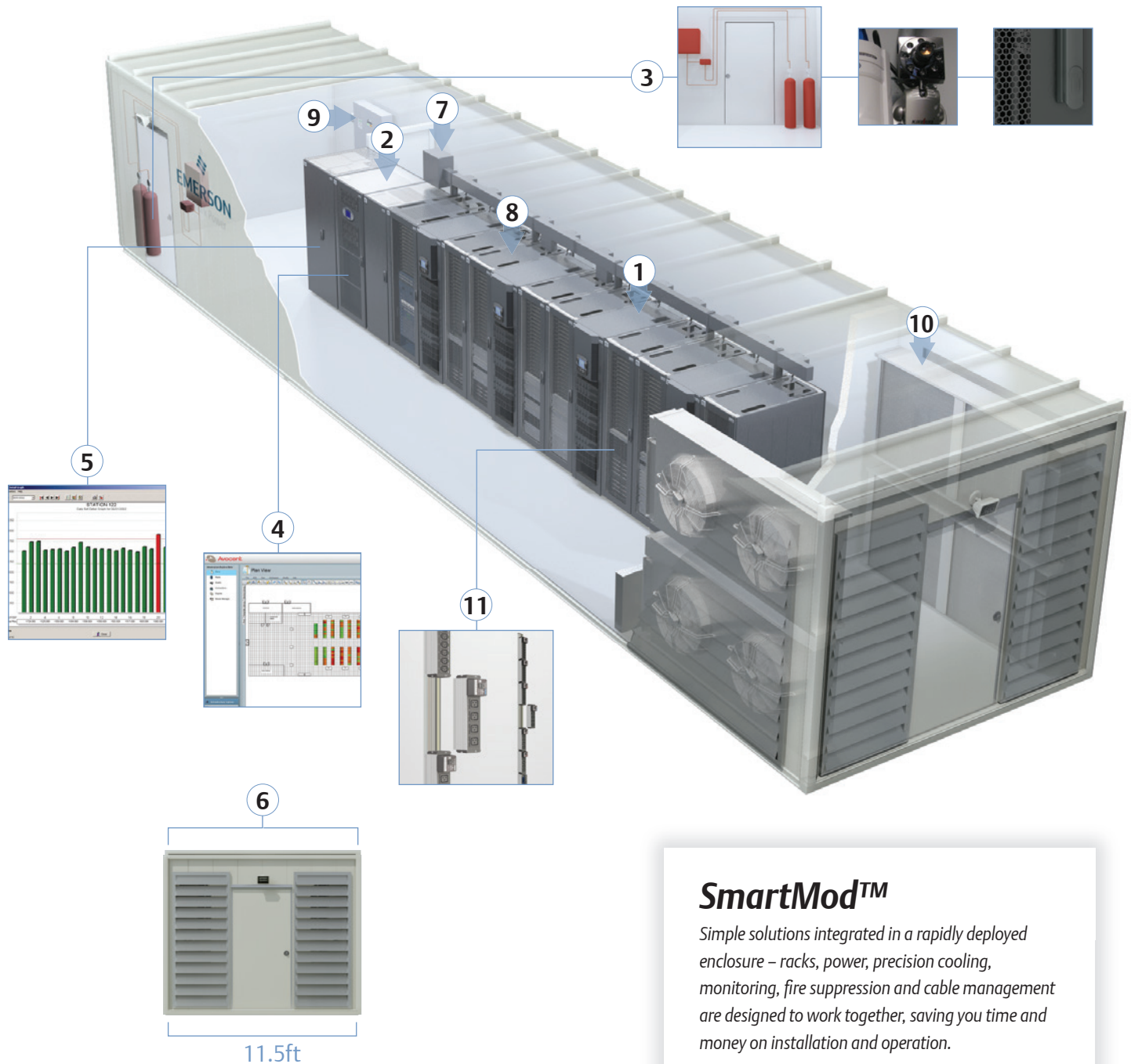
To accommodate larger IT loads, power and IT equipment can be separated into matching enclosures configured to function together.

The SmartMod infrastructure can be used to supplement existing data center capacity, to act as a quickly deployable remote data center, or to serve as a disaster recovery site.



- 1 **High-efficiency cooling technologies support higher density** – Liebert® CRV™ precision cooling system with Liebert iCOM® controls match cooling to rack load, and reduce cooling system energy consumption and cooling system costs
- 2 **Modular, scalable high-efficiency and high-reliability UPS** – Liebert APM™ provides transformer-free, on-line, uninterrupted power, and KIRK™ key interlock system for safety
- 3 **Safe and secure** –
  - Remotely monitor physical security and access through video cameras and access-triggered alarms
  - Integrated fire suppression enhances safety and physical security
- 4 **Comprehensive, remote data center infrastructure management** – Avocent® appliances and software provide comprehensive, remote monitoring and control
- 5 **Proactive battery monitoring and management** – Alber BDSi® in external battery cabinet constantly monitors each battery to ensure availability and reliability
- 6 **Easy access and service** – Unique 11.5-foot internal width provides wider aisles for easy movement and equipment maintenance
- 7 **Flexible power distribution** – Liebert MB® Modular Busway is a flexible and economical way to deliver power to the rack without the cost or hassle of power cable whips. Connects directly to rack PDUs
- 8 **Flexible platform for easy configuration** – Full-depth DCM™ racks maximize space utilization and allow you to add any type of IT or networking equipment and simplify cable management with tool-less accessories
- 9 **Automatic transfer switches** – ASCO® transfer switches provide higher availability by allowing use with a generator
- 10 **Integrated heat rejection** – Quiet, high-efficiency condensers are matched to cooling units for greater operating efficiency. Liebert MC™ condensers require less refrigerant, run more efficiently and run more quietly than other options
- 11 **Flexible rack PDUs** – Liebert MPX™ adaptive rack PDU or Liebert MPH™ managed rack PDU provide flexibility and power control at the receptacle level, and faster implementation of IT equipment





## Sampling of Reference Design Configurations

The SmartMod™ infrastructure solution saves on design and installation costs with fully integrated power, cooling and monitoring in a pre-configured enclosure.

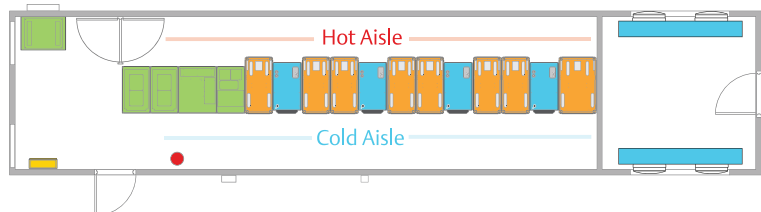
**Because of its rapid deployment, favorable energy and space efficiencies, the SmartMod enclosure is the simple answer to your infrastructure needs.**

### IT Enclosure, 90kW or 75kW

<b>Input voltage</b>	480 or 208 VAC 3-Phase
<b>Rack Space</b>	336 U
<b>Density</b>	90kW: 11.25 per rack 75kW: 9.37kW per rack
<b>Total IT Load</b>	90kW / 75kW
<b>Power Redundancy</b>	90kW: N / 75kW: N or N+1
<b>Cooling Redundancy</b>	90kW: N or N+1 / 75kW: N or N+1
<b>Footprint</b>	11.5'W x 53'L
<b>Heat Rejection Equipment</b>	Integrated Condensers

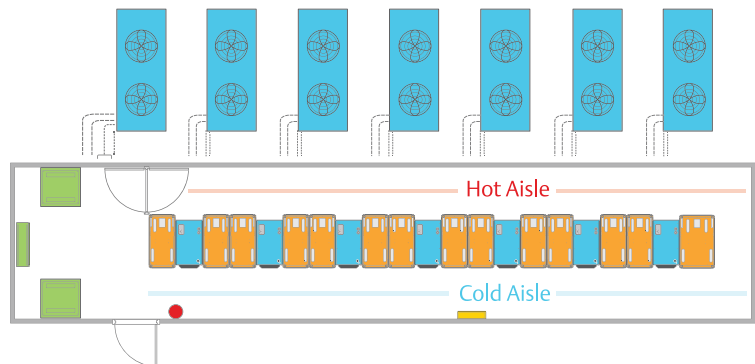
#### Primary Applications

- Remote/off-site deployment, disaster recovery.
- Liebert DCF Racks, Liebert UPS, Liebert MB, Liebert CRV based Precision Cooling
- High Density Designs



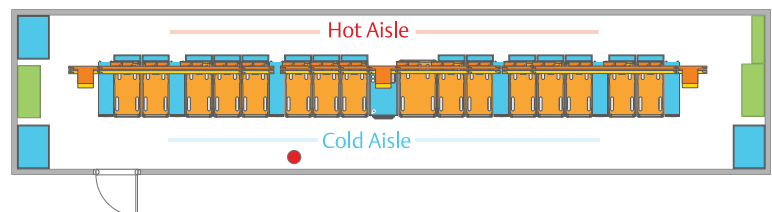
### IT Enclosure, 200kW

<b>Input voltage</b>	480 VAC 3-Phase
<b>Rack Space</b>	14 racks, 588U
<b>Density</b>	14 kW / rack
<b>Total IT Load</b>	200 kW
<b>Power Redundancy</b>	N or 2N
<b>Cooling Redundancy</b>	N+1
<b>Footprint</b>	11.5'W x 53'L
<b>Heat Rejection Equipment</b>	Chilled Water or External for DX

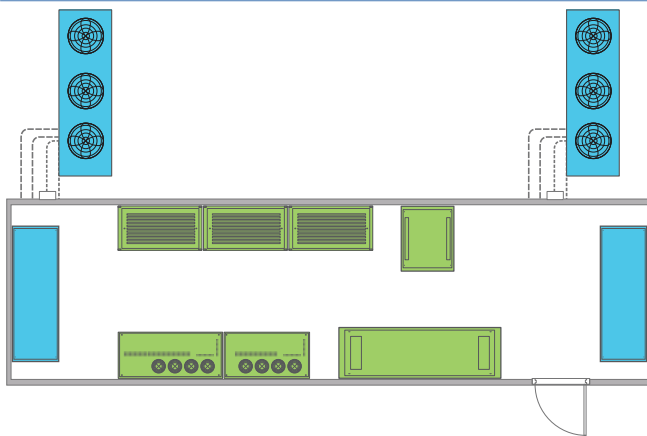


### High Density Enclosure, 330kW

<b>Input voltage</b>	480 or 208 VAC
<b>Rack Space</b>	16 racks, 672U
<b>Density</b>	20.6 kW / rack
<b>Total IT Load</b>	330 kW
<b>Power Redundancy</b>	2N
<b>Cooling Redundancy</b>	2N
<b>Footprint</b>	11.5'W x 53'L
<b>Heat Rejection Equipment</b>	Chilled Water



## AC Power Enclosure, 675 kW

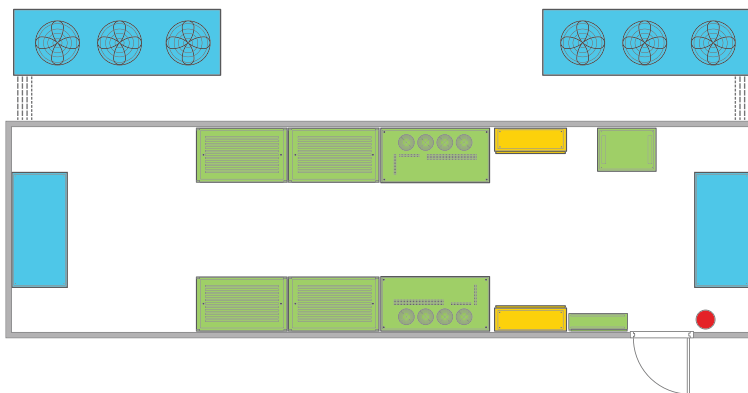


<b>In/out Voltage</b>	480 VAC 3-Phase
<b>Total IT Load</b>	675 kW
<b>Power Redundancy</b>	N
<b>Cooling Redundancy</b>	2N
<b>Footprint</b>	11.5'W x 40'L
<b>Heat Rejection Equipment</b>	External Condensers

### Primary Applications

- Existing Data Center and IT Enclosures
- Liebert UPS, Liebert Battery Cabinets, Liebert Precision Cooling, ATS, Switchboard

## AC Power Enclosure - 200kW

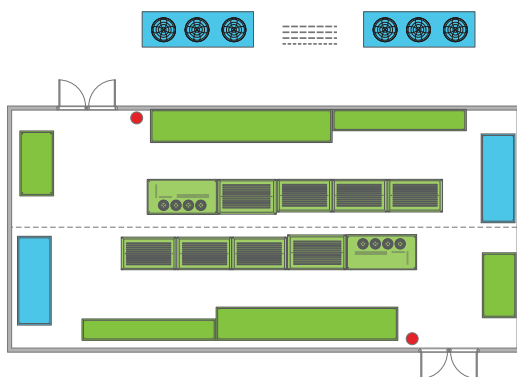


<b>In/out voltage</b>	480 VAC 3-Phase
<b>Total IT Load</b>	200 kW
<b>Power Redundancy</b>	N or 2N
<b>Cooling Redundancy</b>	2N
<b>Footprint</b>	11.5'W x 40'L
<b>Heat Rejection Equipment</b>	External Condensers

### Primary Applications

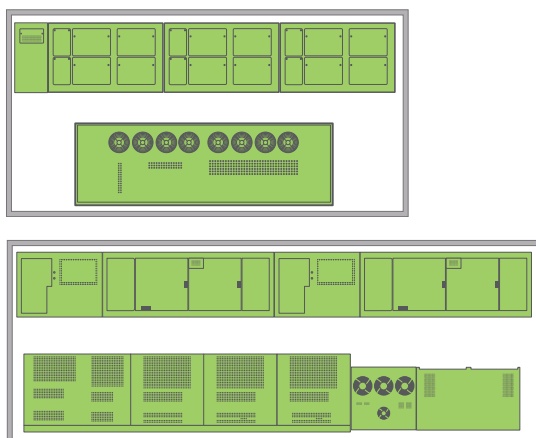
- SMB-Primary Data Centers
- Enterprise- Supplemental
- Increase flexibility, scalability and operational efficiency
- IT and/or Power Enclosures integrated together on-site

## Multiple Integrated Enclosures - AC Power



<b>Components</b>	Cooling, ATS, Switchboards, UPS, Batt, Fire & Monitoring	
<b>Input Voltage</b>	480 VAC 3-Phase	
<b>Power Redundancy</b>	N, 2N, N+1	
<b>Cooling Redundancy</b>	N, N+1, 2N	
<b>Footprint</b>	(2) 11.5'W x 48'L	
<b>Heat Rejection Equipment</b>	External Condensers	
<b>Primary Applications</b>	<ul style="list-style-type: none"> <li>■ Existing Data Center and IT Enclosures</li> <li>■ Liebert UPS, Liebert Battery Cabinets, Liebert Precision Cooling, ATS, Switchboard</li> </ul>	

## AC Power Platform



<b>Components</b>	Liebert NXL 750kVA UPS (3) Battery Cabinets 1200A SwitchGear 1200A STS2 w/Optimize Transfer	Liebert PPC 750kW Transformers, 480v – 415v/240 Liebert EXC Output Distribution
<b>Voltage</b>	480V Input / 240V Output	
<b>Power Redundancy</b>	N, 2N, N+1	
<b>Footprint</b>	8'W x 16'L + 8'W x 21.5'L	
<b>Primary Applications</b>	<ul style="list-style-type: none"> <li>■ Co-Location and Hosting Data Centers</li> <li>■ Assembled on an open skid platform</li> <li>■ Liebert UPS, Liebert Battery Cabinets, Liebert Distribution, ATS, Switchboard</li> </ul>	

Emerson Network Power, a business of Emerson (NYSE:EMR), delivers software, hardware and services that maximize availability, capacity and efficiency for data centers, healthcare and industrial facilities. A trusted industry leader in smart infrastructure technologies, Emerson Network Power provides innovative data center infrastructure management solutions that bridge the gap between IT and facility management and deliver efficiency and uncompromised availability regardless of capacity demands. Our solutions are supported globally by local Emerson Network Power service technicians. Learn more about Emerson Network Power products and services at [www.EmersonNetworkPower.com](http://www.EmersonNetworkPower.com)

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