



Eaton 93PR UPS 25–200 kW

The most advanced UPS for data centers and mission critical applications



Powering Business Worldwide

© 2014 Eaton. All rights reserved

93PR 25-200 kW

Contents

- Why the 93PR
- Product range
- Maximum Availability
- Lowest TCO
- Product Detail



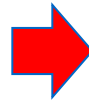
Why 93PR?

Business Challenges of CIO Today



- **Business continuity**
 - *What kind of protected power your data center consume? And how long downtime your business can “survive”*
- **Predictable IT**
 - *In this fast changing technology and business environment today, can you predict your IT requirements next 3 years?*
 - *Right size your starting point and growth plan of your data center power.*
- **Save operation cost**
 - *We care about how much electrical bills we can save for you.*

What kind of POWER your IT need?



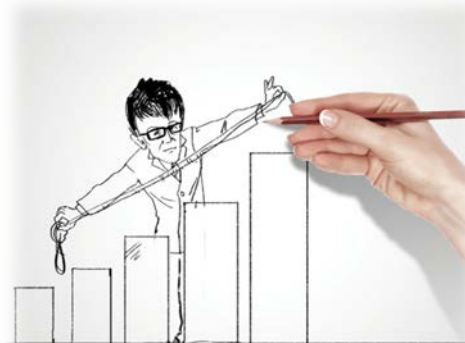
Your Data Center Consume Power & Network all the time

Eaton cares about:

1. Shorten IT/ business downtime
2. Whether your protected power can support your business growth?
3. Your electrical bills.



Reliability



Flexibility



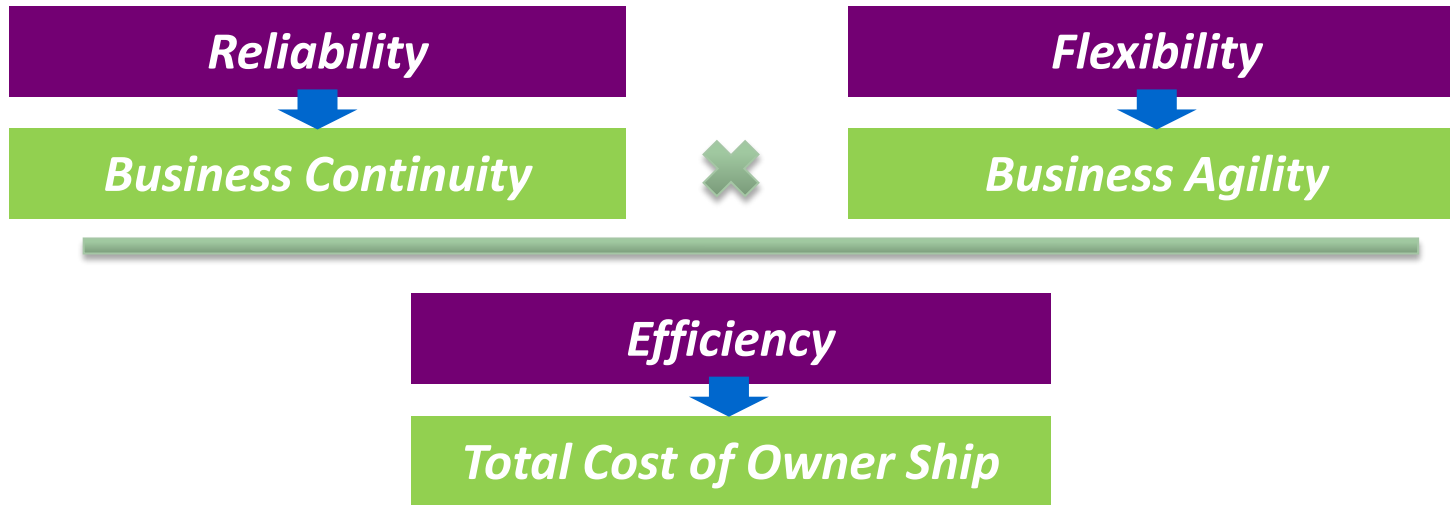
Efficiency

The Solution, 93PR:

- Legendary reliability of Eaton 93 Series.
- Hot Swappable, Pay as You Grow
- Easy deployment and Service
- Highest efficiency, to save operation cost
- Support 25~800KW load
- Eaton Patent Technologies: Hot Sync, ESS, ABM, VMMS



Business Values



Powered by Eaton provide business values to customers,
and solve problems CIO meet today and tomorrow !

Identify an Opportunity - Tower vs. Modular

- Plan with customer - the modular / scalable solutions from very beginning.
- Transit TOWER to MODULAR

Items	Tower	Modular
Cost by redundancy	2N take advantages	N+1 with unpredictable IT.
Pay as Grow	Hard	Easy
Save upfront cost when	FIXED KVA in long term	Plug in and out base on real usage.
Efficiency	Depends on % of load	Higher % of load

How to WIN modular solutions

- Engage Earlier
 - Build up values of modular/scalable solution.
 - Influence budget & architecture
- Focus on Value, not price
 - Solution driven rather than product/category selling
- Future Plans
 - Growth plan align with Business/ IT
 - Upfront cost savings and electrical bills.



Distributed Critical Power Solutions

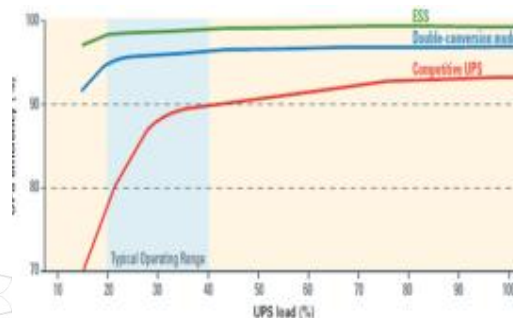
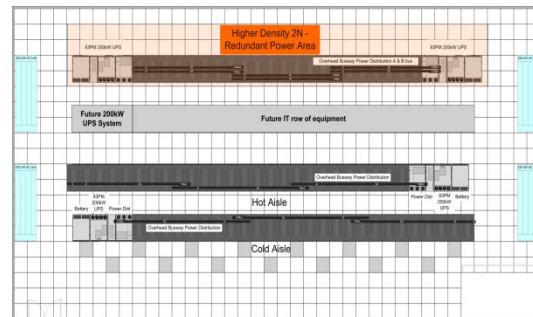
- Ease of Deployment:
 - Modular/Scalable
 - In-row & line and match solutions



- Small footprint:
 - Compact design and internal redundancy



- High efficiency with thermal management:
 - Providing the lowest TCO





The 93PR Concept

Eaton value proposition



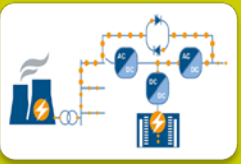
Safety

- Regulatory compliance
- Personnel ALWAYS safe



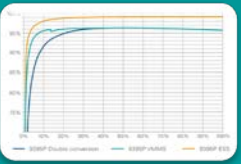
Virtualization & Cloud readiness

- Bridge IT and electrical infrastructure
- Hardware & software...convergence



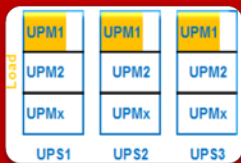
Resiliency

- It's all about availability
- Service Level Agreements / Selectivity



Efficiency

- Cost pressure
- Environmental oversight



Scalability

- Need to optimize capital expenditure
- Need to react fast to customer needs



93PR - Concept

Frame introduction



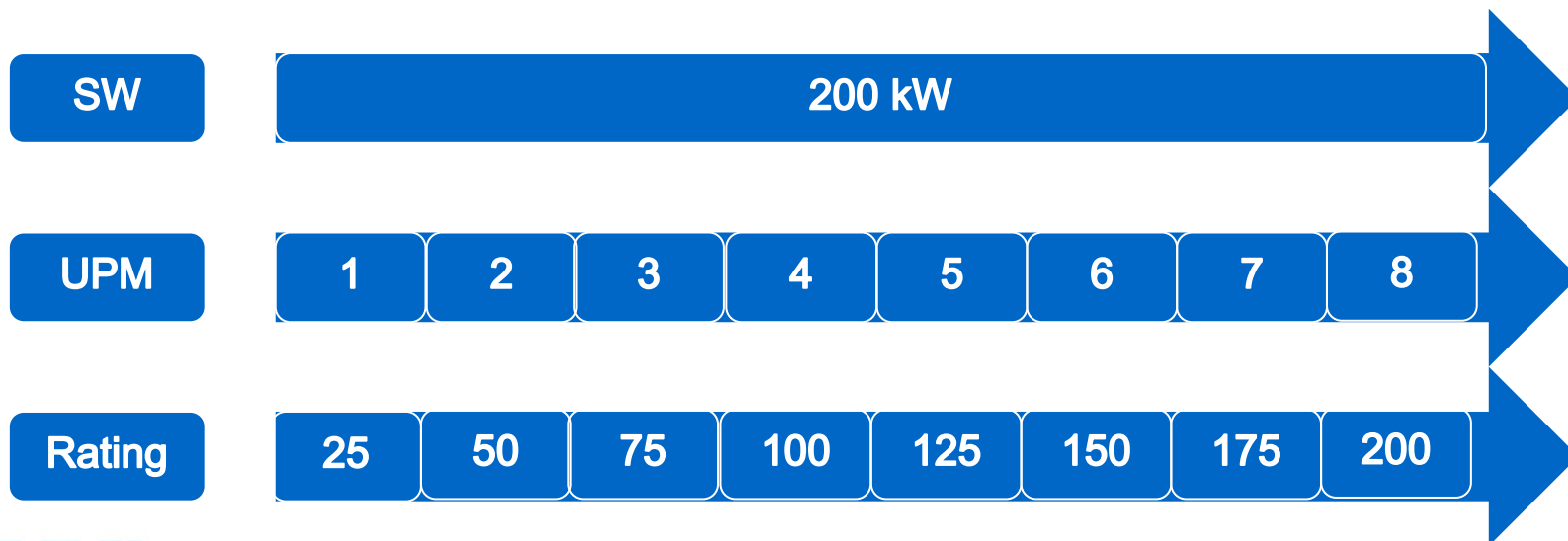
- 19" IT Rack
- 200 kW Static Switch
- 25,50,75,100,125,250,175,200 kW (one to eight modules option)
- Internal redundancy configuration (N+0,N+1,N+2)
- 7" touch screen colour display
- 3 mini-slots and 5 Building Alarms inputs
- 48V terminal of having voltage to trip DC breaker
- Top and bottom cable entry
- Standard Input Switch
- Optional internal MBS or internal DC breaker
- 25kW/ module, 3U height
- 28Kg/UPM total and less the 25Kg when remove fans and capacitors



93PR – Concept *Ultramodular*



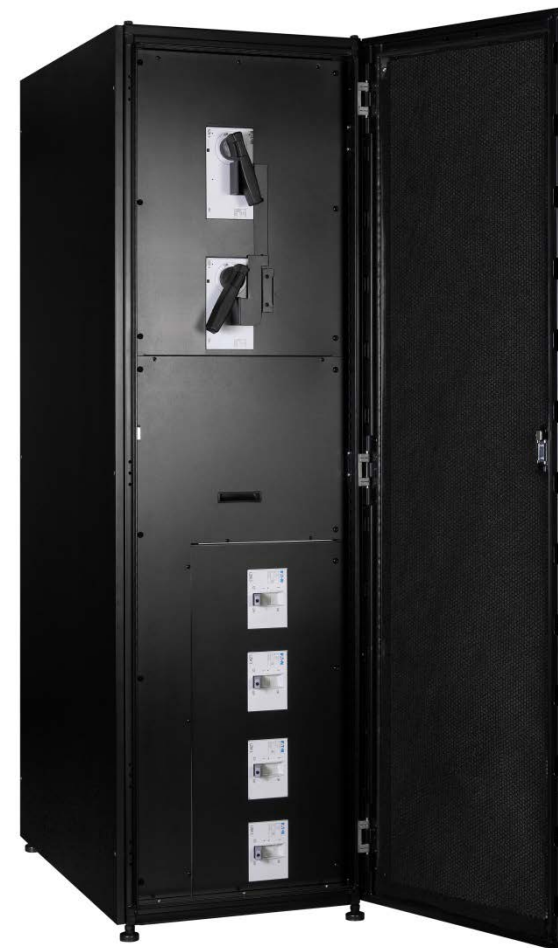
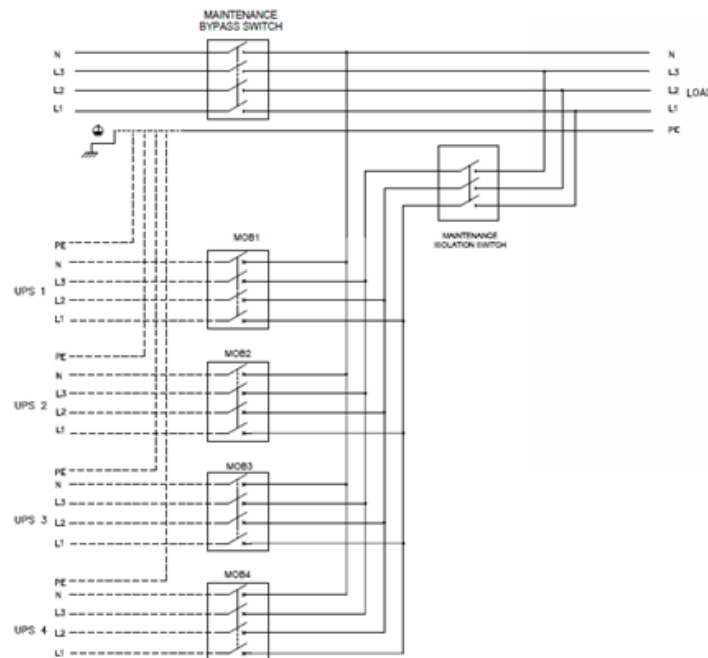
- Power ratings: 25,50,75,100,125, 250,175,200 kW
- Modular design: 25 kW hot-swappable modules
- The system can automatically identify the UPM quantity and system rating



93PR –Parallel Tie cabinet



- 19" IT Rack, Line-up-and-match 93PR
- Include 2 to 4 Module Output Breakers (MOB) according parallel UPS system
- Includes UPS output isolators and a system bypass(600kVA) in a compact cabinet
- Isolate the complete system when UPS maintenance





93PR – Maximum availability

93PR – Maximum availability Safety design



- Design and selection focus on safety, such as to select Bussmann fuse.
- Redundance design: Such as Fan, System PS.
- Ambient temperature : 0 °C to + **40 °C** without output power de-rating



93PR - Maximum availability

Hot swap and hot scalable



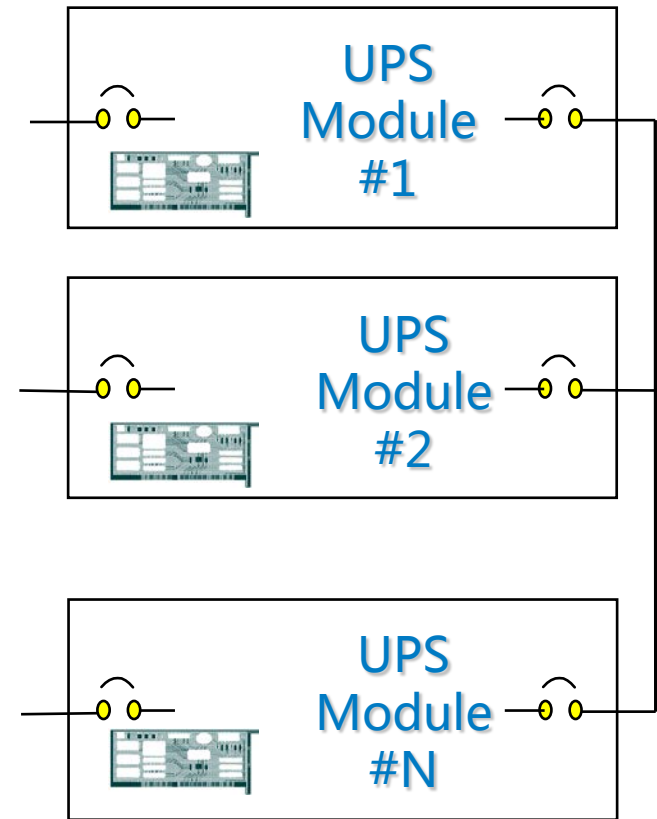
- A module can be replaced while the others continue protecting the load (**concurrent maintenance**)
- A module can be added while the others continue protecting the load (**hot scalable**)
- No need to go to bypass for replacement/upgrade (**MTTR =0**)
- System maintenance can be typically performed in less than **10 minutes**
- Procedure to be conducted by **professionally trained** personnel (**Safety first**)



93PR – Maximum availability HotSync parallel technology

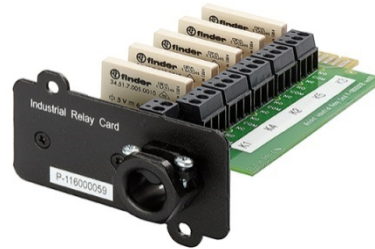
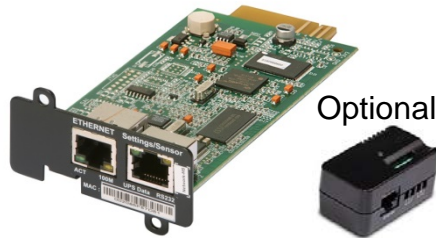


- Patented method for load sharing
- Peer-to-peer control strategy
- Each UPM/unit synchronises independently
- **Erases single point of failure**
- **Ensure vertical and horizontal upgrade**
- No 'master-slave' configuration
- No load share signals
- Selective tripping
- Enhanced reliability



93PR - Maximum availability

Extensive availability of comm. protocols



Network Card-MS	Industrial Relay card	PXGMS card
Web/SNMP	Industrial grade relay card	Web/SNMP/Modbus card
<p>Software support:</p> <ul style="list-style-type: none"> • IPP, IPM • Legacy: <ul style="list-style-type: none"> • NSM, NetWatch 5 • LanSafe (requires settings in card) <p>Other features:</p> <ul style="list-style-type: none"> • Email alarms • SNMP v 3, IP v 6 • SNMP with Pulsar MIB, Power MIB and standard UPS MIB (RFC 1628) • Temperature, humidity and 2 status inputs through Environment Sensor (optional) 	<p>5 output relays, 1 digital input</p> <p>Connections</p> <ul style="list-style-type: none"> • 250 V/5 A • Switching relays (NO/NC) • Isolated • Terminal block connections 	<p>Based on PowerXpert Gateway platform</p> <p>Software support:</p> <ul style="list-style-type: none"> • IPP, IPM <p>Other features:</p> <ul style="list-style-type: none"> • Email alarms • SNMP v 3, IP v 6 with Power MIB and standard UPS MIB (RFC 1628) • ModBus RTU and TCP • BACnet IP • Temperature, humidity and 2 status inputs through Environment Sensor (optional)

93PR - Maximum availability

Extensive availability of comm. protocols



Software communications & Connectivity

- ✓ Three MiniSlots for additional connectivity hardware
- ✓ Host and device USB port
- ✓ Five building alarm inputs and dedicated EPO
- ✓ Relay alarm output (more available as option)



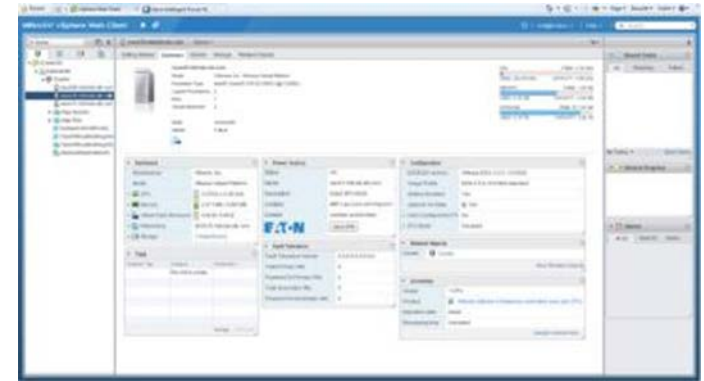


93PR – Maximum availability *Cloud & Virtualization-ready UPS*

93PR - Maximum availability *Cloud & virtualization ready*



- View, monitor and administer not only physical and virtual servers, but UPSs, PDUs and other power devices through one console
- Receive network- and power-related alerts through their virtualization management application
- Shut down virtual servers as well as physical ones automatically and gracefully during power failures
- Automatically suspend non-critical virtual machines, consolidate critical loads on fewer host servers and shut down unused host servers



93PR - Maximum availability Integration with leading IT vendors



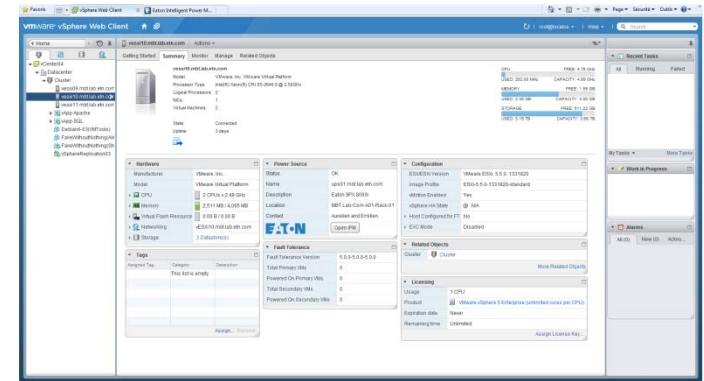
Eaton's Intelligent Power Software Suite integrates with leading including virtualization and storage platforms:



Intelligent Power Management (IPM) and



Intelligent Power Protector (IPP)



View host servers, storage AND power devices
from a *single pane of glass*

Eaton Intelligent Power Manager



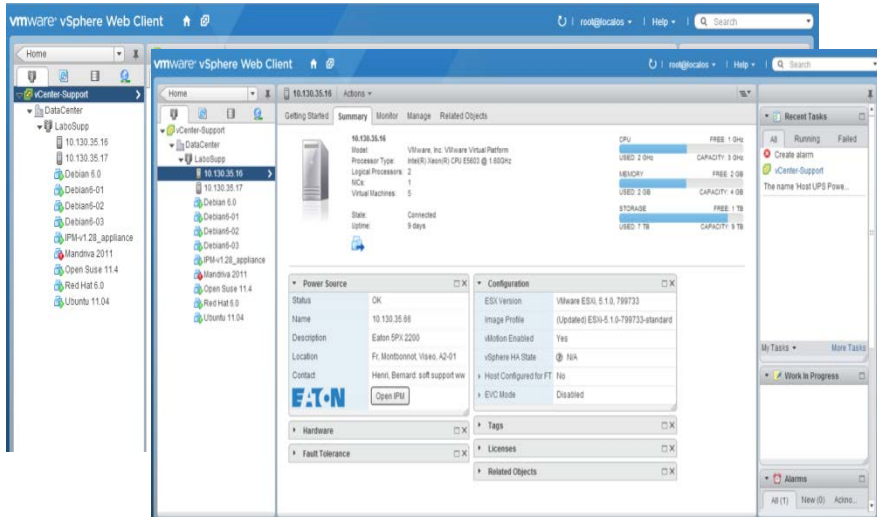
ePDU



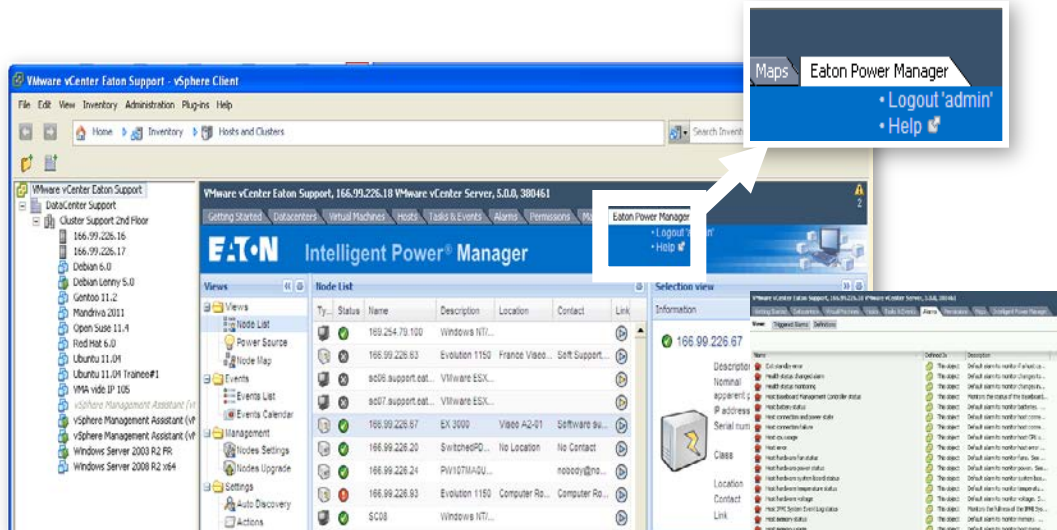
Intelligent Power Manage



Single pane of glass management



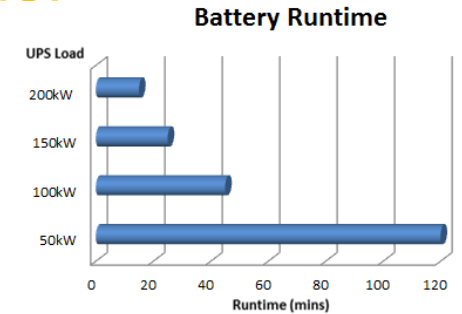
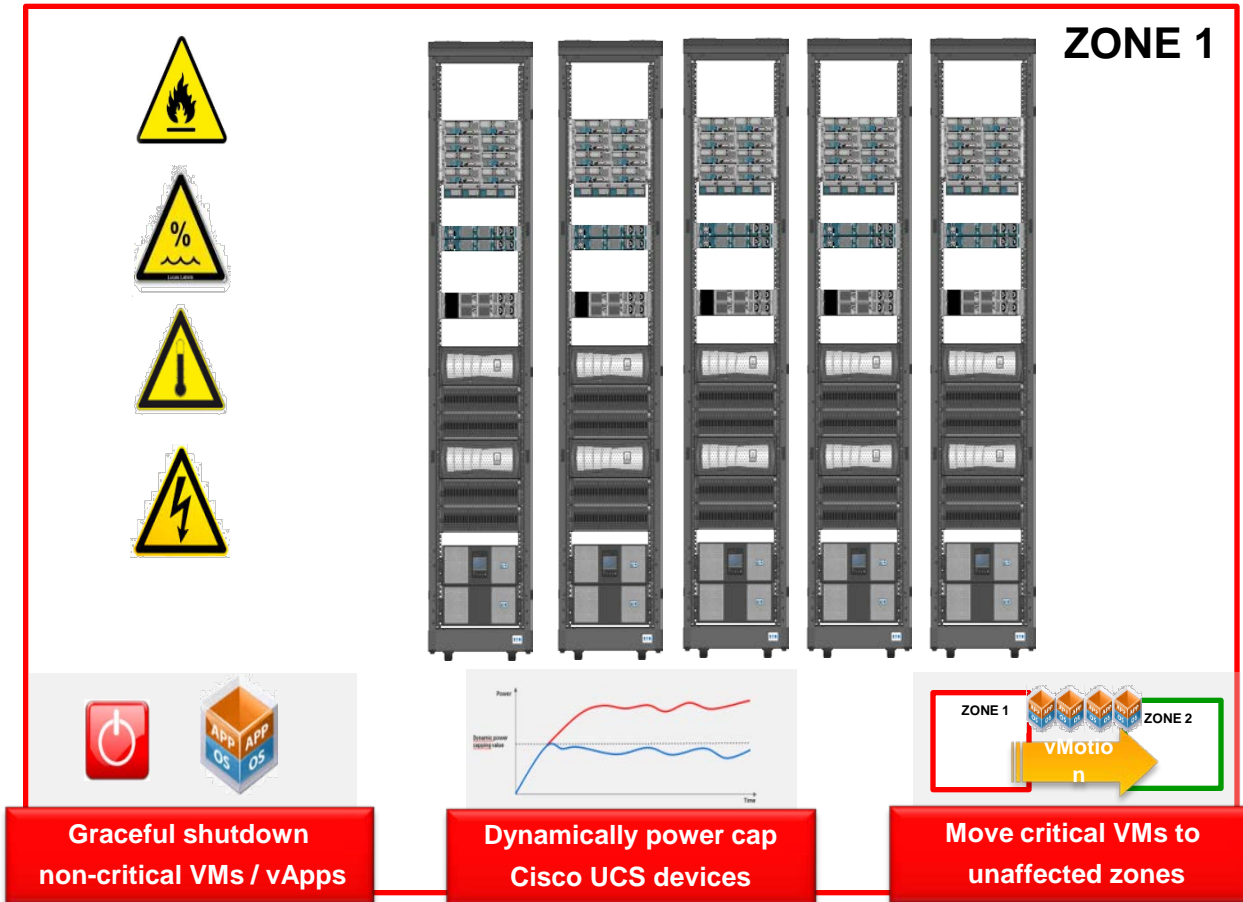
vCenter Web client widget



vCenter plugin & power events

Load shedding

50% drop in load equates to 150% more runtime!



- Suspend non-critical virtual machines
- Consolidate critical virtual machines
- Power cap Cisco UCS devices
- Works with VMware Distributed Power Manager

Eaton Software Competitiveness



IPM Feature	End User Benefit	Eaton IPM/IPP	Second best
Server shutdown	Graceful Shutdown of VMs and host servers in case of power failure	✓	✓
Plugs into Virtualization Platforms - tab (traditional vSphere client)	Higher productivity - view from single plane of glass	✓	✓
Plugs into Virtualization Platforms vCenter web client – VMware’s new method	Higher productivity - view from single plane of glass - works with VMware’s future look of vCenter	✓	✗
Power capping with Cisco UCS Manager	Extends battery run time	✓	✗
Agentless server shutdown	Achieve shutdown function from one point with less setup work	✓	✓
Storage shutdown	Can send signals to NetApp storage devices for shutdown as appropriate	✓	✗
Converged infrastructure compatibility	vBlock Ready, NetApp Flexpod, EMC VSPEX	✓	✗
Disaster recovery/avoidance	Works with VMware Site Recovery Manager to initiate planned migration to back-up site on power event notification with no data loss	✓	✗
Localisation	User interface supports multiple languages	✓	✗



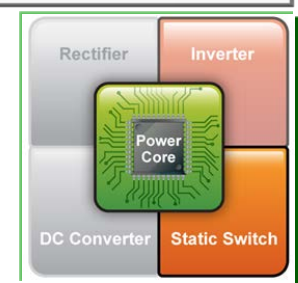
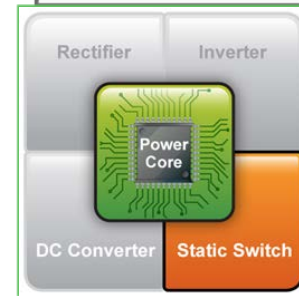
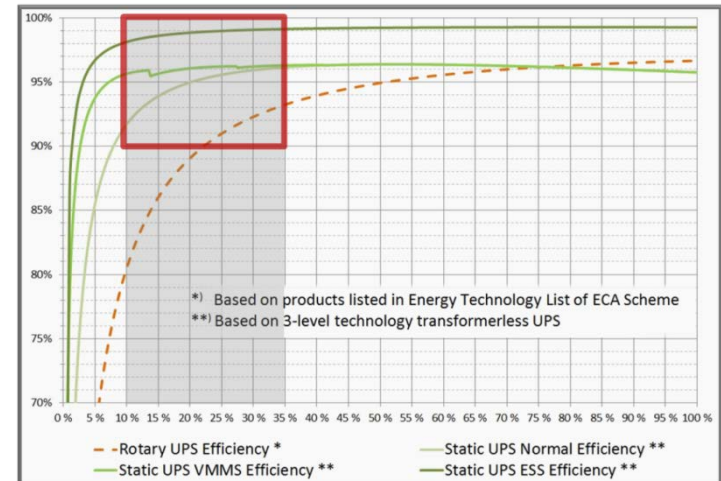
93PR – Lowest Total Cost of Ownership

93PR – The most efficient UPS in its class

99% efficiency with Eaton's advanced algorithms



- Energy Saver System (ESS) is a proprietary technology that monitors the grid and automatically selects the optimal power protection option
- Continuous monitoring of UPS output voltage and transfer to double conversion mode within ~2 ms when needed
- Inherent filtering against fast low energy transients
- Lifetime of UPMs components will increase (fans, capacitors, electronics)

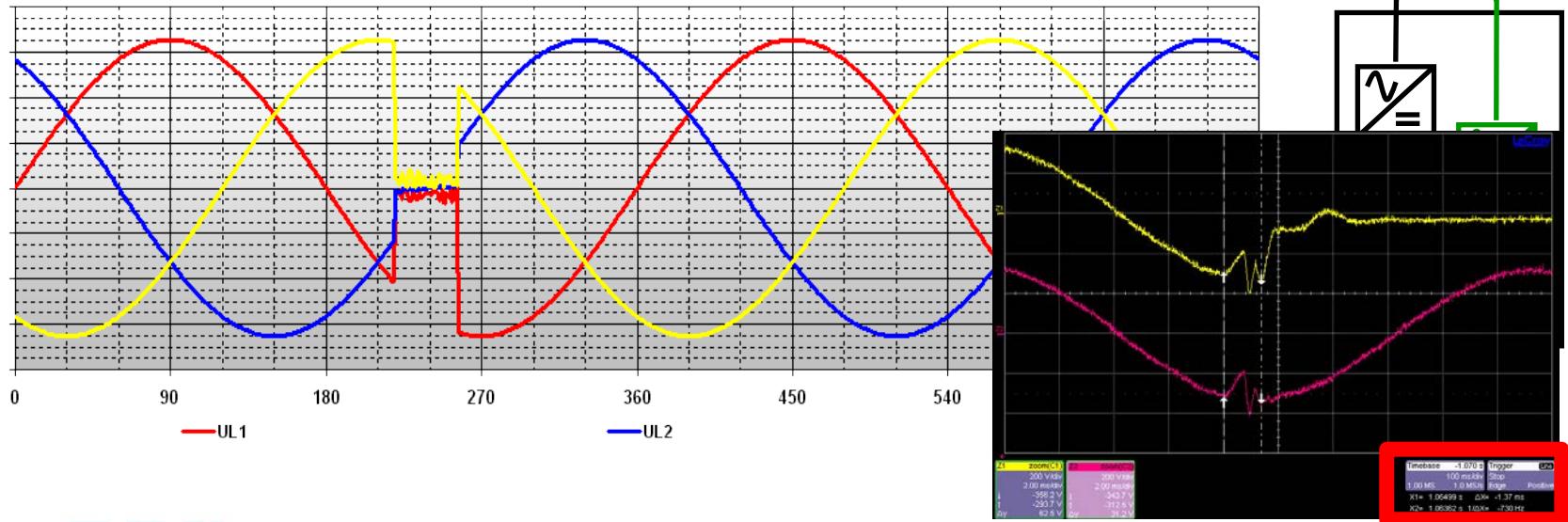


93PR – The most efficient UPS in its class

ESS- How does it work?



- UPM:s (rectifier and inverter) in ready state mode
 - Rectifier and Inverter contactors are closed, DC-link primed through IGBT diodes
- Efficiency ~99% from 30% partial load and up
- Continuous monitoring of UPS output voltage and transfer to double conversion mode within ~2ms when needed
- Lifetime of UPM:s components will increase (fans, capacitors, electronics)
 - Fans are off, when UPM running on ready state
- Transfer from **ESS** to Double Conversion and back with push button or externally using building input (lightning detector etc.)

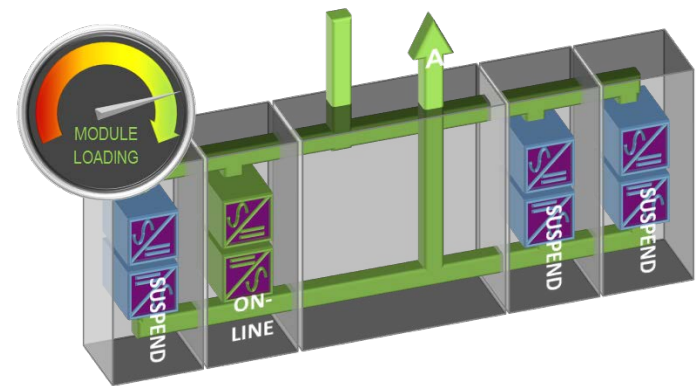
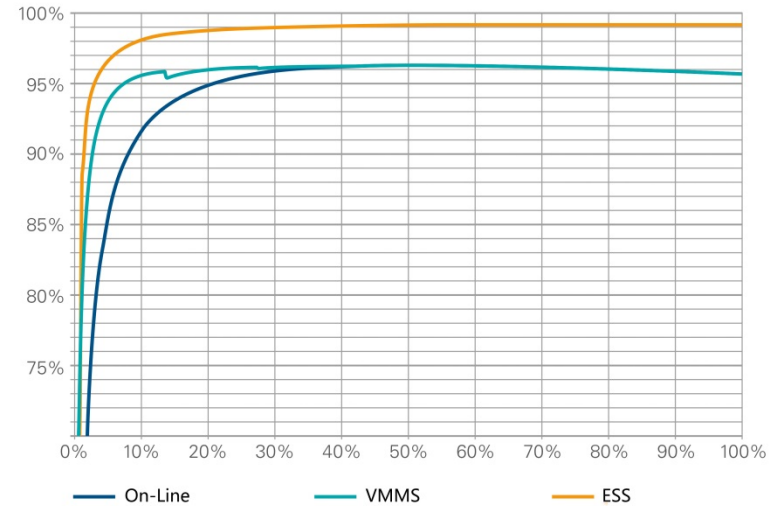


93PR – The most efficient UPS in its class

Optimized double conversion efficiency



- Load optimized double conversion efficiency with automatic variable power module management
- System automatically suspends and engages modules to optimize efficiency
- Available at both UPS and system level



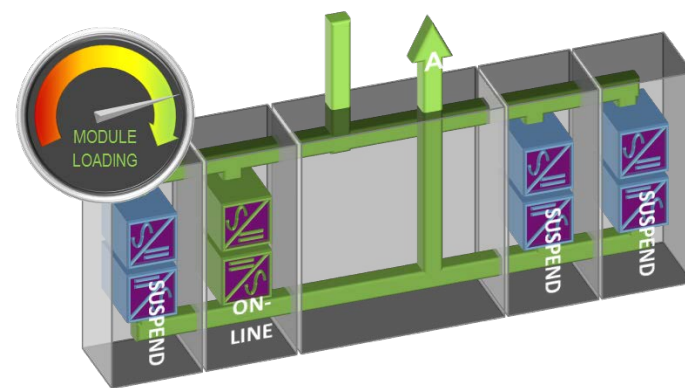
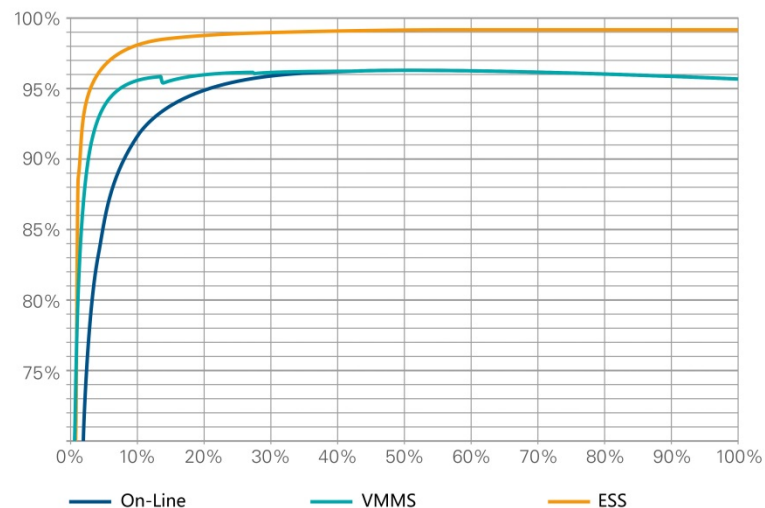
Energy Advantage Architecture
Variable Module Management System (VMMS)

93PR – The most efficient UPS in its class

The highest double conversion efficiency



- For single modules and applications where ESS is not optimal then the 93PR still offers the highest double conversion in the market
- Based on its 3-level converter topology the 93PR achieves above **96%** efficiency levels (IEC 62040-3)
- Double conversion provides maximum protection in challenging environments (supply or load)

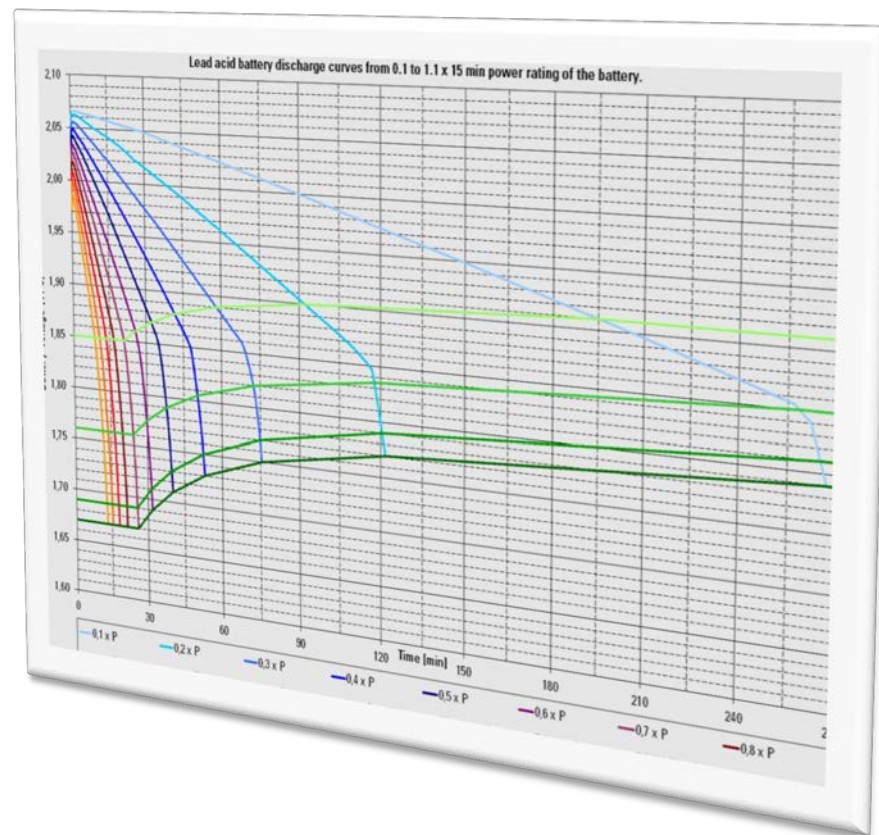
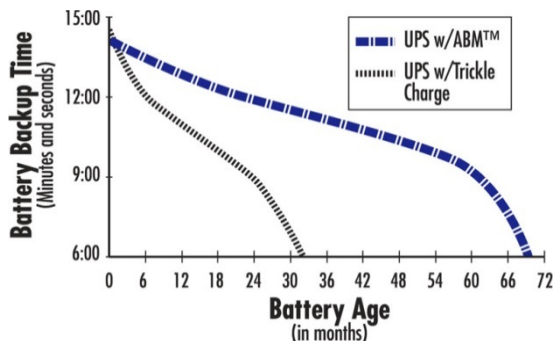


93PR – Advanced Battery Management (ABM®) prolong battery life about 50%



Advanced Battery Management (ABM®)

- ABM charging algorithm prolongs battery service life
- Load adaptive battery cut-off voltage optimises system battery set-up to the actual load



93PR – Maximum scalability



Year 2
175kW



Future, more rating



- Scalability and flexibility
 - Reducing the amount of time required to scale up in response to increased demand from days to **minutes** (hot swap)
 - Scaling up without affecting the footprint to save floorspace
 - Optimizing CAPEX → "Pay as you grow"
- Internal redundancy for high availability
 - HotSync technology for reliable and resilient load sharing
 - Each UPM in the system operates independently
- External redundancy for improved scalability
 - Parallel up to 4x frames (possibility up to 8)
 - **Total system size up to 800kW (1600kW)**

93PR – Inherent redundancy



- Due to its modular design the 93PR can provide redundancy at UPS level generating significant savings in footprint, cooling and electrical installation
- Can be configured N+0, N+1 and N+2, such as 200kW, 175KW+25kW and 150kW+50kW.

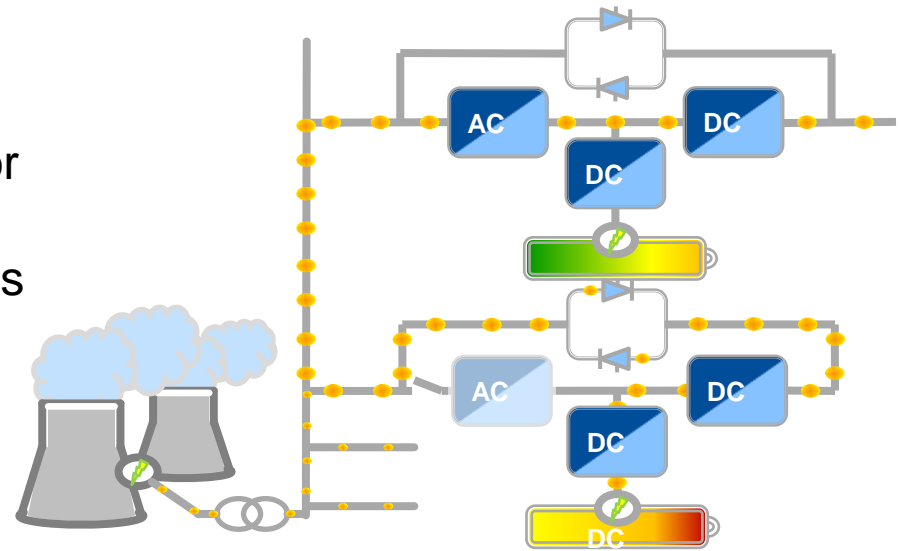
Did you know that by buying a modular design you can save up to xx % of your initial investment
A typical data center will upgrade in 2 years.





Easy Capacity Test

- Provides savings in annual battery autonomy tests
- Reduces amount of work and need for rental equipment (load bank, cabling)
- Power discharged from the batteries is fed to other loads in parallel UPS system through static switch
 - Savings in energy consumption
- No need to transfer the load to other systems
 - Concurrent maintainability
 - Maximised availability
 - Less risk for business



ECT TESTING OF



**= SAVING OF 1 UPS
PURCHASE PRICE**



93PR – Product Detail

93PR front view

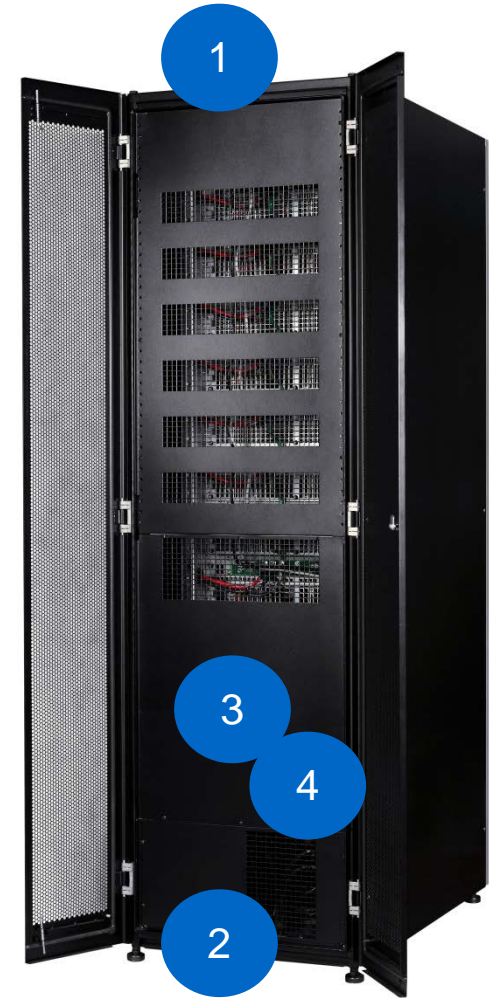
- 1 Communication-3 slots, 5 building alarm.
- 2 Parallel cable terminal
- 3 Input Switch
- 4 Classic Efficiency (>96%) UPM
- 5 Optional internal maintenance switch
- 6 200kW static bypass switch
- 7 7" LCD Touch Screen Display
- 8 LPS



93PR 200kW front view

93PR open door rear view

- 1 Top cable entry
- 2 Bottom cable entry
- 3 Cable terminal
- 4 48V trip terminal



93PR 200kW rear view

UPM overview

- 1 Handle
- 2 Battery start button
- 3 LED Indicator
- 4 Fan and capacitors that can be disassembled easily
- 5 UPM lock
- 6 Hot swap connection



UPM is shipped separately

93PR family overview



93PR summary



EATON

Powering Business Worldwide