Product brochure Eaton 93PM UPS 30-500 kVA

Eaton
93PM
UPS

EATON
Powering Business Worldwide
Eaton 93PM UPS

The performance of Eaton 93PM UPS is proven with installations totaling no less than 500 MVA installed capacity globally. It provides the highest availability for mission critical applications at the lowest Total Cost of Ownership.

**LOWEST TOTAL COST OF OWNERSHIP**

**RESILIENT**

**SCALABLE**

**SMART**

**EFFICIENT**

**HIGHEST AVAILABILITY**

**EASE OF DEPLOYMENT**

**EASE OF MANAGEMENT**

**POWER RATING**

**30-500 kVA**

Can be paralleled up to 2 MVA
Over 50 years of UPS Leadership

Eaton’s long history of UPS expertise encompasses small, medium and large data centers as well as industrial applications. We have a deep understanding of our customers’ needs, ensuring more efficient and more reliable power supply solutions.

Innovation is integral to our heritage, with patented systems such as Best Power, Powerware, MGE Office Protection Systems and B-Line.

The 93PM UPS represents the latest in our long line of market-leading, technologically advanced UPSs for mission-critical applications.

Made in Finland

Eaton manufacturing facility and center of competence for 3-phase UPS is located in Finland. Opened over 50 years ago, the factory has delivered more than 250,000 UPS units to date. The site hosts more than 500 visitors annually for Factory Acceptance Tests and UPS demonstrations.

Your mission critical UPS

Whatever your mission-critical application, the 93PM UPS offers the power performance, scalability, resiliency and efficiency you need.

It is ideal for:
- Small, medium and large data centers
- Finance and banking critical infrastructure
- Commercial buildings and industrial complexes
- Transportation infrastructure
- Healthcare
- Telecommunications installations
Eaton 93PM suits every need

Eaton 93PM is easy to deploy in various applications from Data Centers to infrastructure and rail to healthcare equipment and process automation.

<table>
<thead>
<tr>
<th>UPS capacity range</th>
<th>30 – 60 kVA</th>
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<tbody>
<tr>
<td>Number of power modules</td>
<td>1</td>
</tr>
<tr>
<td>Maximum system size</td>
<td>8 UPS in parallel</td>
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<tr>
<td>Internal batteries</td>
<td>11 to 30 min full load runtime</td>
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<th>30 – 200 kVA</th>
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<tbody>
<tr>
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<td>1 … 4</td>
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<td>Maximum system size</td>
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<th>UPS capacity range</th>
<th>100 – 500 kVA</th>
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<tr>
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<tr>
<td>Maximum system size</td>
<td>4 UPS in parallel</td>
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All-round value

Our goal is to deliver the highest availability for mission critical applications at the Lowest Total Cost of Ownership for cost-efficient business continuity.
All-round value

Efficiency
With market leading efficiency being translated into reduced electrical and cooling losses, the 93PM helps to minimize operational expenditure. Reduced power losses also lead to higher sustainability, through reduced carbon emissions.

Resiliency
The ability of a system to absorb faults and still remain in its desired operational state is paramount to minimizing costly downtime. The 93PM includes a number of features to ensure the highest possible resiliency for mission critical applications.

Safety
Eaton 93PM makes electrical installation safety easy for the end users, planners and contractors – required safety equipment come integrated and inbuilt. Did you know that each UPS installation is required to be equipped with a backfeed isolation contactor and short circuit protective devices? With Eaton UPS, we have pre-designed, pre-tested and pre-installed these equipment within the UPS.

Scalability
Scalability helps to optimize capital expenditure by enabling the pay-as-you-grow approach. The UPS capacity can be increased at any time, simply by adding power modules to the existing UPS or by adding a new UPS in parallel to the existing installation.
Lower energy consumption

Losses and energy consumption are reduced due to the market leading double conversion efficiency of up to 97% provided by the 93PM. The 93PM completely isolates output power from all input power anomalies, and delivers 100% conditioned, perfect sine-wave output even during severe power disturbance.

Ultimate savings

Energy Saver System (ESS) improves the 93PM efficiency levels to 99%, by suspending the power modules when power conditioning is not required. The power is fed through the static bypass line, with double conversion operation available in less than 2ms, in the event of exceeding pre-set input limits. In addition to extremely low losses, the ESS mode provides filtering against fast low-energy transients. It is simply the most advanced, most reliable, fastest-reacting energy saver architecture available.

Optimised double conversion

Variable Module Management System (VMMS) helps to achieve high efficiency even when UPS load levels are low – typical for redundant UPS systems. VMMS can optimize the load levels of power modules in a single UPS or in parallel UPS systems, by suspending extra UPS capacity. The result is optimal online efficiency at all load levels. The technology is resilient against sudden changes in load level or in available UPS capacity thanks to the Hot Sync technology.

Lowest Total Cost of Ownership

The Eaton 93PM costs you less to own because it is more efficient, thanks to a number of leading technologies – some of them unique to Eaton.

CO2 EMISSION REDUCTION

157 TONNES

= x32 FLIGHTS AROUND THE GLOBE PER PERSON

* System of 93PM 400kW operating at 20% load level
Double conversion efficiency
High online efficiency significantly lowers operation costs and provides savings in cooling. Replacing an older generation UPS with a 93PM will be paid back in 2-3 years.

Energy Saver System
ESS is the most proven and reliable energy saving system in the market with many years of usage within a wide install base. Even when comparing to extremely high double conversion efficiency, ESS mode can further reduce the losses by 74% with a typical UPS load.

Easy Capacity Test
Load testing can be costly and time consuming – but not with the 93PM. Its Easy Capacity Test (ECT) feature recirculates the energy from the UPS for testing. Hence there’s no need to rent costly load banks and no time or energy wasted on temporary load connections.

ECT TESTING OF = SAVING OF 1 UPS PURCHASE PRICE

96.7% 3 YEARS PAYBACK TIME

900000 kVA of UPS CAPACITY IN ESS MODE
74% Less Losses

What’s in it for me?
Check Eaton’s new TCO calculator eaton.eu/TCO
Each power module includes all components required for double conversion operation. In addition, there is one common fully rated static bypass per UPS. This topology enables combining the benefits of modularity – flexibility, availability and scalability – with the resiliency of centralized static bypass.
**Flexibility and availability**

Modular structure can ensure the simplest possible configuration to meet site-specific UPS power and redundancy requirements flexibly. The Uninterruptible Power Modules are able to operate independently, introducing inherent redundancy and maximizing availability of the critical load.

**Scalability**

Eaton 93PM UPS provides several options for scaling and tailoring the optimal fit for your application. UPS power scaling can be achieved by adding a new UPS in parallel to the existing installation or by increasing the UPS capacity. Eaton modular UPS support scalability of capacity any time, simply by adding a new power module to the existing UPS.

**Scalable UPS design that does not compromise selectivity**

The UPS bypass capacity needs to match the site requirements for selectivity from day one – even in scalable designs. Using non-compatible UPS designs, where bypass capacity changes with scalability, reduces the availability of the critical load resulting in more extensive, costly downtime. Eaton modular UPS enables designing scalable systems with full bypass capacity installed, with no compromises required for selectivity.

**Mix and match**

The UPS double conversion capacity and static bypass capacity of the 93PM UPS can be sized separately, to match higher fault current levels of the installation. This enables matching of the UPS to site requirements, without the need to invest in extra UPS capacity in case of high fault current levels.

The modular design of the 93PM allows UPS capacity to be increased at any time, simply by adding power modules to the existing UPS. Capacity can be increased in steps of 50 kVA, whilst still providing full bypass capacity from day one.
Whatever the changing conditions – and however quickly they change – the Eaton 93PM UPS is designed to maintain a steady, uninterrupted, clean power supply. This market-leading resiliency is the result of a number of advanced technologies built-in to the 93PM.

Higher availability

RELIABILITY
What makes the difference when evaluating the reliability of UPS?

EXPERIENCE
of serving the applications

PRODUCT DESIGN
Avoiding “conditions apply” designs

MANUFACTURING PROCESS
Quality through processes

PRODUCT FEATURES
Resiliency of the UPS system in various conditions
Hot Sync
Hot Sync is a patented load-sharing technology for parallel operation of UPS inverters, without communication or load-share signals. Not relying on communication link or master-control topology, the 93PM UPS provides the highest possible reliability by eliminating the single point of failure in a parallel operating UPS system.

Advanced Battery Management
The Advanced Battery Management extends the life of valve-regulated lead-acid (VRLA) batteries, through an intelligent charging routine. This prevents unnecessary charging and significantly retards the battery wear rate. ABM technology is widely used and accepted technology with a 20-year proven track-record.

Reliable operation with mains supply and generator
Eaton 93PM UPS provides unity input power factor throughout the load range – providing cost savings in upstream distribution and excellent compatibility with generators. The wide frequency and voltage range of UPS rectifier ensures that batteries are not worn out even if the mains network quality is poor. Eaton 93PM UPS comes with advanced and configurable rectifier functions, such as rectifier walk-in ramp and step load reduction. On Generator limits and delayed rectifier start-up, providing reliable operation with mains and generator.

Electrical installation safety made easier
Designing safe electrical installations are made easy for the designers and end users of Eaton UPS. The important safety requirements are implemented into the UPS design as standard.

The installation fault current levels are determined by the size of incoming transformer. The UPS is validated for prospective short circuit current of Icc 100kA, which is suitable for practically all installations. Eaton 93PM UPS comes with an integrated Bussmann ultra-rapid fuse in its bypass line. Eaton UPS are guaranteed to be safe and compatible with any installation fault current levels, no conditions apply.

The UPS safety standard (IEC/EN 62040 Part 1) also requires backfeed isolation device to be connected in the UPS static bypass path due to human safety under thyristor short circuit condition. Eaton UPS come with backfeed isolation contactor integrated internally in the unit. This also guarantees that a shorted thyristor will have no effect to the double conversion operation of the UPS, removing the single point of failure.

Eaton 93PM design ensures ease of deployment, with pre-designed, pre-tested and pre-installed safety components integrated as standard. Eliminating the need to design them into the upstream panel reduces the total cost of installation.
Ease of Deployment
The fully front-accessible design allows quick access for service and maintenance. Front access, together with innovative thermal management options of front-to-top or front-to-rear airflow, also enables installation against a wall or back-to-back, in row or in hot/cold aisle configuration – maximizing deployment flexibility.

Accessorize your UPS
Eaton’s range of accessories for 3ph UPS systems provides flexible installation options that expedite deployment and save valuable space. The aesthetically designed accessories enable coordinated solutions that enhance both safety and reliability whilst reducing installation time and total cost.

Supercapacitors
A short runtime back-up power solution has traditionally meant high-maintenance batteries or a less efficient mechanical flywheel. The new Eaton XLM Supercapacitor modules can now be integrated with the Eaton 93PM UPS to offer a new back-up power solution that is highly reliable, economical, maintenance free and manufactured from environmentally friendly materials.

The solution can tolerate high ambient temperatures and provide extremely fast recharge time. The solution can also tolerate high amount of discharge-charge cycles without significant effect to the supercapacitor health.
**Eaton Connected**

Eaton Connected is an all-in-one solution for power distribution and UPS back-up power. By bringing you pre-designed solutions and prefabricated interconnections, Eaton Connected helps you to manage installation risks by simplifying the whole process from sourcing to commissioning.

Both Eaton 93PM UPS and Eaton Power Xpert CX LV Switchgear are individually proven products in challenging applications. Now Eaton Connected is also tested and verified as one system, for your ultimate peace of mind.

**UPS and Overhead Power Distribution**

Employing the height and vertical space for UPS power distribution frees up floor and wall space, making it possible to easily fit 1,6 MW of UPS capacity in just six meters width. This pre-designed, pre-fabricated solution provides higher quality and fast build and expansion. The result is savings in space usage, labour and time. The solution is an optimal fit for containerized solutions and restricted spaces.

![Diagram of UPS and Overhead Power Distribution](image)

**Diagram Notes:**
- Input side overhead busbar
- Output side overhead busbar
- I/P Tap-Off
- O/P Tap-Off

**Approx 6 Meters for 1.6 MW**
Intelligent, intuitive

Eaton 93PM UPS provides easier access to detailed status information through its large, user-friendly LCD touchscreen display. UPS status LED indicators are fitted to the UPS, providing quick and easy detection of the system status and facilitating trouble shooting.
Single pane of glass

Utilising Eaton’s Intelligent Power Software Suite (Intelligent Power Manager IPM and Intelligent Power Protector IPP) the 93PM integrates with leading virtualization and storage platforms, and allows users to view, monitor and administer physical and virtual servers, UPSs, PDUs and other power devices, from a single pane of glass.

Network- and power-related alerts will be provided through the virtualization management application, and the 93PM will take the resiliency of the system to the next level, by bridging the electrical and IT infrastructures.

Simple policy-based integration

Intelligent Power Manager ensures business continuity by enabling simple, policy-based controlled automation – driven by power and environmental events. In case of power outage, the IPM provides several options to extend runtime for critical applications:

- Load shedding: non-critical services can be suspended or carefully shut down
- Critical loads can be consolidated onto fewer host servers
- Unused host servers can be shut down
- If UPS battery levels dips below a threshold, vmotion can be triggered to move critical Virtual Machines to an unaffected host.
At your service everywhere

With three Power Quality manufacturing facilities in the EMEA region, plus a strong local service presence, Eaton will provide your UPS with expert support from day one to the end of its service life.

Peace of mind
Eaton has a service team on call 24/7, to minimize risks through early detection of problems and timely action, before disturbances or downtime result.

There are over 120 Eaton field engineers operating across EMEA – all comprehensively trained and continually updated on the latest products and technologies.

The dedicated support package they provide will ensure your equipment runs safely, reliably, sustainably and with the utmost energy efficiency, at all times.

The proof is in the testing
The quality and reliability of the Eaton 93PM is not something you have to wait to experience, Eaton’s 5 MW state-of-the-art testing facilities in Finland allow you to conduct standard and customized tests to meet your specific needs, and to address your “what if” scenarios.
## Technical specifications

### General
- **UPS output power rating**: 30-500 kVA
- **Efficiency in double conversion mode**: Up to 97%
- **Variable Module Management System (VMMS)**: double conversion
  - Significantly increased efficiency at low loading
- **Efficiency in Energy Saver System (ESS)**: > 99%
- **Paralleling capability**:
  - 30-200 kVA: Up to 8 units
  - 250-500 kVA: Up to 4 units
- **Rectifier and inverter topology**: Transformer-free 3-level IGBT-converter
- **Audible noise**:
  - 30-60kVA: <60 dBA
  - 80-200kVA: < 65 dBA
  - 250-500kVA: < 69 dBA
  - ESS mode: < 47 dBA
- **Altitude (max)**: 1000 m without derating (max 2000 m)

### Input
- **Input wiring**: 3ph + N + PE
- **Nominal voltage rating**: 220/380V; 230/400V; 240/415V 50Hz/60Hz
- **Input frequency range**: 40 to 72 Hz
- **Input power factor**: 0.99
- **Input iTHD**:
  - 30kVA, 60kVA: < 4.5%
  - 40-500kVA: < 3%
- **Soft start capability**: Yes
- **Internal backfeed protection**: Yes

### Output
- **Output wiring**: 3ph + N +PE
- **Nominal voltage rating**: 220/380V; 230/400V; 240/415V 50Hz/60Hz
- **Load power factor range**: 0.8 lagging – 0.8 leading

### Battery
- **Battery type**: VRLA
- **Charging mode**: Advanced Battery Management or Float
- **Temperature compensated battery charging**: Option
- **Battery start capability**: Yes
- **Alternative backup power technologies**:
  - Wet cell batteries
  - NiCd batteries
  - Li-Ion batteries
  - Supercapacitors

### Accessories
- **Long life batteries**
- **External battery cabinets and supercapacitor cabinets**
- **External maintenance bypass switch panels, Integrated manual bypass**
- **Battery breaker enclosures for rack batteries**

### Connectivity
- **Native Relay inputs / outputs**
  - 5 relay inputs and dedicated EPO
  - 1 relay output
  - More relay contacts available as option
- **Software**
  - Eaton Intelligent Power Manager
  - Eaton Intelligent Power Protector
- **PXGMS –card**
  - Web/SNMP/Modbus RTU and TCP/BACnet IP
  - Temperature, humidity and two status inputs through Environmental Monitoring Probe (option)
- **Network-MS card**
  - Web/SNMP
  - Temperature, humidity and two status inputs through Environmental Monitoring Probe (option)
- **INDRELAY-MS card**
  - 5 output relays, 1 digital input

### Compliance with standards
- **Safety**: IEC 62040-1; CB certified
- **EMC**: IEC 62040-2
- **Performance**: IEC 62040-3
- **RoHS**: EU directive 2011/65/EU
- **WEEE**: EU directive 2012/19/EU

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1 Additional information on ESS performance, refer to 93PM UPS Technical Specification. Due to continuous product improvement programmes, specifications are subject to change without notice.
The future of power protection starts here

The 93PM UPS gives you a glimpse into the future of power protection. To see more of the future, visit www.eaton.eu/93PM now.