

# More advanced power protection





## Eaton 93PS UPS 8-40 kW

Lowest total cost of ownership and maximum availability – taking scalability, resiliency, safety and efficiency to the next level.

The most advanced UPS in its power range, the Eaton 93PS is ideal for small data centres and other mission critical applications where efficiency, reliability, safety and scalability are essential.

### Future-ready

The rapid adoption of the cloud, constant evolution of IT technologies, increased focus on environmental footprint and sophistication of mission critical applications is demanding even more **efficient**, **resilient**, **scalable** and **safe** power protection solutions.

The new levels of efficiency and scalability offered by the 93PS minimise Total Cost of Ownership while the safety and resiliency, both in infrastructure and IT layers, maximise availability and ensure business continuity.



### 50 years of UPS leadership

Eaton's long history of UPS expertise encompasses small, medium and large data centres as well as industrial applications, so we have a deep understanding of our customers' needs.

Innovation is also integral to our heritage, with patented systems such as Best Power, Powerware, MGE Office Protection Systems and B-Line. In fact, we have led the way in UPS innovation for 50 years – bringing our customers new, more advanced, more efficient and more reliable power supply solutions.

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

### Meeting your needs

The 93PS UPS has been developed to meet your current and future needs for efficiency, resilience, scalability and much more. It not only provides market-leading efficiency across operational modes, but also a modular design to support scalability and minimise MTTR.

### 100% quality and beyond...

The 93PS is manufactured in our manufacturing site in Finland. Opened over 50 years ago, the factory has delivered more than 250,000 UPS units to date. Eaton's UPS centre of competence is also at our site in Finland, which hosts more than 500 visitors a year for Factory Acceptance Tests (FATS) and demonstrations.

### Innovation in action

Eaton's strength in innovation makes us the natural choice as leaders of GreenDataNet: a consortium of technology innovators and manufacturers, working to develop state-of-the-art technology which will allow urban data centres to balance rising demand with sustainable energy policies.

Other Green Data Net members are: the Swiss Federal Institute of Technology Lausanne, Nissan, ICTRoom, Credit Suisse, the French Alternative Energies and Atomic Energy Commission and the University of Trento.

### Your mission-critical UPS

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

It is ideal for:

- small data centres
- commercial buildings and industrial complexes
- transportation systems
- hospitals
- finance and banking critical infrastructure
- security operations
- telecommunications installations
- process control equipment





## All-round value

Available in small and large frame sizes and 8-40 kW, in a modular design, there's a 93PS to suit a wide range of requirements. And, whichever one you choose, you can be sure it will provide the lowest Total Cost of Ownership combined with maximum availability, for cost-efficient business continuity.

Ensuring that you can always access the power your mission-critical application requires – under all circumstances – without compromising business performance or safety, the 93PS is the most efficient, scalable, resilient, Cloud-ready and safe UPS you can choose.



### Efficiency

With high efficiency being translated into reduced electrical and cooling losses, the 93PS helps to minimise operational expenditure costs, in addition to addressing the cost pressures resulting from commoditization of IT services. Increased efficiency also leads to higher sustainability, through reduced carbon emissions. The 93PS's compliance with environmental regulations and oversight helps with qualification for incentive schemes.



### Scalability

Scalability helps to optimise capital expenditure by only deploying additional equipment when necessary and providing additional flexibility to respond to your changing needs. The scalability of the 93PS also provides increased flexibility to accommodate the changing requirements of rapidly evolving technologies.



### Resiliency, virtualisation and cloud-readiness

The ability of a system to absorb faults and still remain in its desired operational state is paramount to minimising costly downtime. The 93PS takes resiliency to the next level by bridging electrical and IT infrastructures.



### Safety

Ensuring safety in any electrical installation is a must, not only to comply with local electrical regulations and protect personnel, but also to maximise availability. The 93PS design simplifies and facilitates the compliance with local regulation installations.



### Improved Modularity

#### Power rating

- 8, 10, 15, 20 kW (small frame, one module)
- 8, 10, 15, 20, 30, 40 kW (large frame, two module slots)

#### Static switch

- 20 kW standard on small frame
- 40 kW standard on large frame, optional on small frame

#### Internal batteries

- 32 blocks per string
- 2 strings (small frame)
- 4 strings (large frame)

#### Internal MBS

- Optional on both frames

#### Display

- 5" touch-screen on both frames

## The most efficient, lowest TCO UPS in its class

The Eaton 93PS is simply the most efficient UPS in its class, offering the lowest Total Cost of Ownership. Thanks to Eaton's advanced algorithms and energy-saving features, the 93PS achieves up to 99% efficiency. This efficiency is well proven with installations in major datacentre hubs in Europe and around the world. Calculate your own Total Cost of Ownership at: [eaton.eu/TCO](http://eaton.eu/TCO).

### 99% efficiency - Energy Saver System (ESS)

Improves the 93PS efficiency levels to 99%, by suspending the power modules when power conditioning is not required. The power is fed through the static bypass switch, and in the event of exceeding pre-set input limits the UPS is ready to switch to double-conversion mode in under two milliseconds. 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.

In addition to saving energy, this technology enhances the reliability of the system by reducing electrical stress in the power electronic components, extending the UPS life time and thus reducing total cost of ownership.

### Optimised double conversion efficiency - Variable Module Management System (VMMS)

For applications where ESS may not be optimal, for example with very low quality mains, VMMS technology includes automatic variable power module management. The system automatically suspends and engages modules as appropriate, to optimise efficiency both at UPS and system level.

VMMS helps you achieve high efficiency even when UPS load levels are low – typical for redundant UPS systems. VMMS can optimise the load levels of power modules in a single 93PS UPS or in parallel systems, by suspending extra UPS capacity. This means not only greater efficiency at lower load levels, but optimum efficiency at all load levels.

### Maximum double conversion efficiency

The 93PS still offers the highest double conversion efficiency in the market, reaching above 96%.

CO2 EMISSION REDUCTION

19 TONNES

x4



FLIGHTS AROUND THE GLOBE PER PERSON

\* 1x40 kW in ESS mode with 50% load level over 10 years compared to double conversion

### Maximum scalability

The highly scalable nature of the 93PS means that scaling up in response to increased demand takes minutes rather than hours. Scaling up can also be achieved without increasing the footprint – saving valuable floor space. The modular design allows for internal redundancy, which eliminates the need for an additional UPS for N+1 configurations.

External redundancy also improves scalability, by paralleling up to 8 frames for a total system size of up to 320 kW.

### Highest power density

The unity power factor maximises the true available power of the 93PS. This means it can deliver up to 20% more real power than other UPSs in its class.

### Reduced footprint

The extremely small footprint of the 93PS can free up valuable space for revenue generating equipment in the Data Centre.

### What's in it for me?



Check Eaton's new TCO calculator [eaton.eu/TCO](http://eaton.eu/TCO)





## Maximum availability

Maximum availability is integral to business continuity, and integral to the design of the Eaton 93PS UPS. It ensures you can always access the power your mission-critical application requires.

### Hot swappable and hot scalable

Due its modular design, a 93PS power module can be replaced or added while another module continues protecting the load. This eliminates the need to go to bypass for module replacement or upgrading (MTTR: 0 minutes). Replacement and upgrade operations typically take less than 10 minutes.

### Centralised topology and super-sized static switch

The 93PS's centralised topology is ideal for scalable systems, as it provides full bypass capacity from day one, whereas modular designs with static switches in every power module can have a severe negative impact on the selectivity of the system due to undersized static bypass. This can compromise the availability of the overall system.

Available as an additional option, the 93PS offers a super-sized static switch for applications where more static bypass capacity is needed.

### Flexible battery configuration

With internal battery models, the 93PS offers the possibility to have either central or separate battery configurations. By default, capacity models have centralised configuration, while redundancy (N+1) and scalable models have separate configuration.

The UPS can protect the load while batteries are replaced (MTTR: 30 minutes), and individual strings can be serviced while other strings are connected and supporting the load.

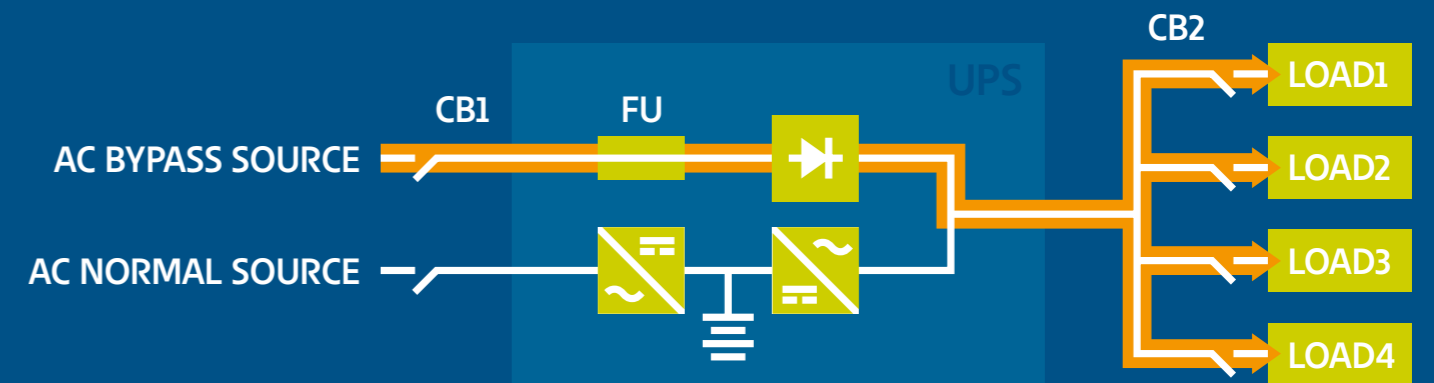
### Independent controllers

Each UPS has a single controller, but each power module has its own independent controller. If the main UPS controller fails, the module controller can take over. These independent controllers enable a faster response time in the event of failure.

## Common versus Separate Battery configuration



## Static Switch



## More safety

The 93PS features simplified compliance with local electrical installation regulations and maximises safety of both personnel and electrical installations.

### Back-feed protection device

The International standard and European Normative IEC 62040-1 states that a UPS device shall prevent all hazardous voltage and energy from being transferred to the UPS input terminals after the input power has been interrupted. This can only be achieved by means of either an internal or external back-feed protection device in the static bypass circuit of the UPS.

The 93PS includes an internal back-feed protection device in all its models ensuring compliance and eliminating any unnecessary costs and effort installing an external device in an existing electrical installation.

### Ultra-safe battery cabinets

Battery cabinets should be designed to provide sufficient airflow to prevent a dangerous concentration of gases. The 93PS battery cabinet range ensures maximum safety by complying with safety standards IEC 62040-1 and EN50272-2. In addition, all battery cabinets include a battery breaker for isolation and short-circuit protection as well as poka-yoke features for safe and easy replacement.

### Maintenance Bypass Switch (MBS)

The 93PS range includes two, three and four switch maintenance bypass models and a three breaker battery module for a variety of configuration options. All models are IEC 61439 compliant for safety and performance, and feature a rotary-type switch which prevents human operational error.





## More intelligence

The Eaton 93PS UPS is a uniquely intelligent UPS, which is both virtualisation- and cloud-ready.

### Single pane of glass

Utilising Eaton's Intelligent Power Software Suite (Intelligent Power Manager – IPM – and Intelligent Power Protector – IPP) the 93PS integrates with leading virtualisation 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 virtualisation management application, and the 93PS 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. Users can create policy-based integration between their power infrastructure, vmware, Cisco UCS and NetApp storage devices, to automatically expose the state of the power infrastructure to higher-level IT systems and virtualisation orchestrators.

### Load shedding

One of the key benefits of policy-based integration is load shedding. A 50% drop in load equates to up to 250% more battery run-time.

Intelligent Power Manager provides several options to extend runtime for critical applications. For example:

- if the UPS battery level dips below 30%, vmotion can be triggered, to move critical VMs to an unaffected host
- if the UPS goes onto battery
  - non-critical services will be suspended or carefully shut down
  - critical loads will be consolidated onto fewer host servers
  - unused host servers will be shut down.

As a result, battery run-time will be extended, providing a larger window for SRM disaster recovery.



## 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, so risks can be minimised 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 Eaton UPSs is not something you have to wait to experience. Eaton's state-of-the-art testing facilities in Finland allow you to conduct standard and customised tests to meet your specific needs, and to address your "what if" scenarios.

### Expert specialist support

The specialist Eaton 3-phase Solutions team offers tailored solutions and support for customers with large power supply needs – such as data centres – or who operate in industries with specific requirements, such as marine or offshore.

The service extends from planning to manufacturing, and from onsite testing to commissioning.







## Eaton 93PS user display

For user safety and convenience, the 93PS displays a range of colored LED indicators as operating status alerts. These are displayed both on the cabinet door of the UPS and on screen.

### Normal operation



### Bypass mode



### Battery mode (blinking)



### Alarm



## Eaton 93PS components

- Due to its modular design the 93PS can provide redundancy at UPS level generating significant savings in footprint, cooling and electrical installation
- 8, 10, 15 and 20 N+1 models with both central and distributed battery configurations

### Communication ports

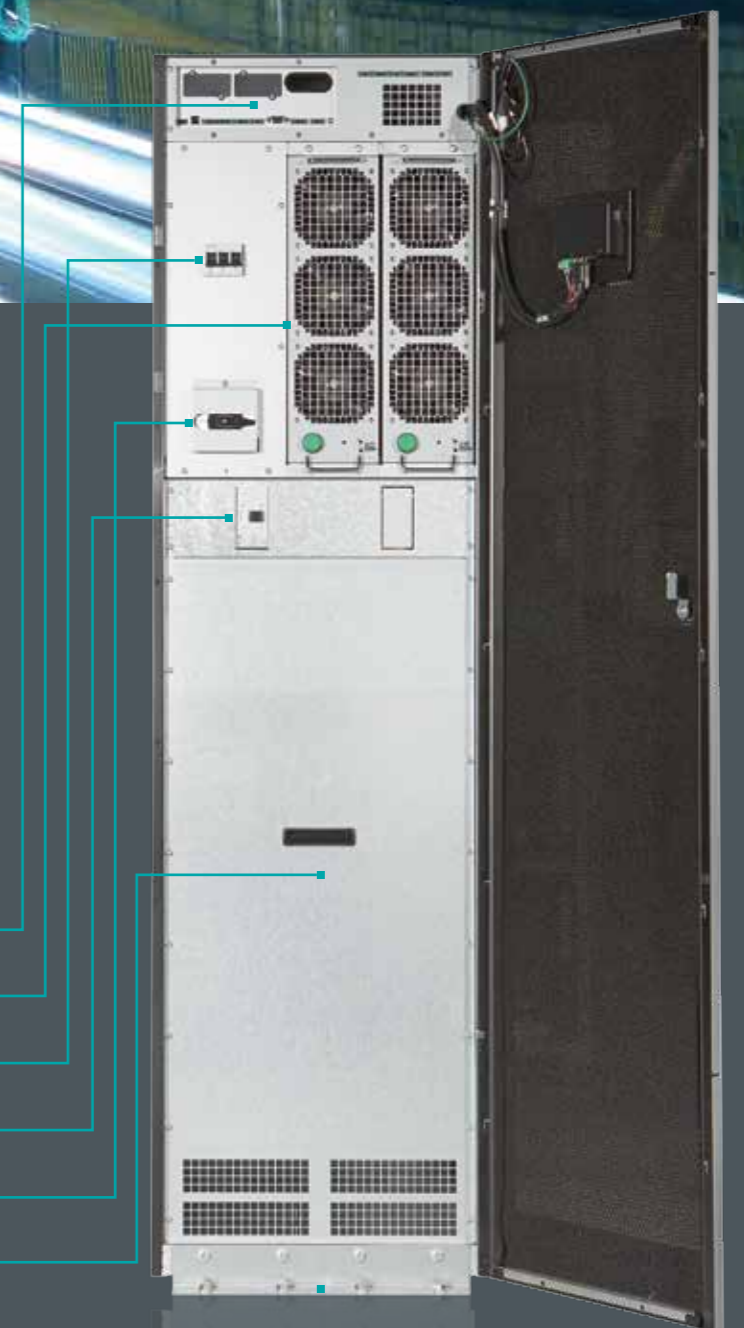
### Power Module (UPM)

### Input Switch

### Battery Breaker

### Maintenance Bypass Switch (MBS)

### Internal Battery





# Technical specifications

| GENERAL   | 8-20 kW   | 8-40 kW   |                  |               |               |               |
|---|---|---|------------------|---------------|---------------|---------------|
| UPS output power rating (1.0 p.f.)                  | 8, 10, 15, 20   | 8, 10, 15, 20, 30, 40, 8+8, 10+10, 15+15, 20+20 |                  |               |               |               |
| Model catalogue reference                           | 93PS-XX(20)-YY-   | 93PS-XX(40)-YY-                                 |                  |               |               |               |
| Number of internal batteries                        | 0 to 2 x 32 blocks  | 0 to 4 x 32 blocks                              |                  |               |               |               |
| UPS options   | Long life batteries (LL)<br>Internal maintenance bypass switch (MBS)<br>External maintenance bypass switch<br>External battery cabinets |   |                  |               |               |               |
| Upgradability                                       | Yes, up to 20 kW  | Yes, up to 40 kW                                |                  |               |               |               |
| External paralleling                                | Up to 4 units with HotSync technology   |   |                  |               |               |               |
| UPS topology  | Double conversion   |   |                  |               |               |               |
| Efficiency in Double conversion mode                | >96%  |   |                  |               |               |               |
| Efficiency in Energy Saver System (ESS)             | Up to 99%   |   |                  |               |               |               |
| UPS dimensions (width x depth x height)             | 335 x 750 x 1300 mm   | 480 x 750 x 1750 mm                             |                  |               |               |               |
| UPS Degree of protection                            | IP 20   |   |                  |               |               |               |
| Acoustic noise at 1 m, in 25 °C ambient temperature | < 60 dBA in double conversion<br>< 47 dBA in ESS  |   |                  |               |               |               |
| Maximum service altitude                            | 1000 m (3300 ft) above sea level at 40 °C<br>Maximum 2000 m (6600 ft) with 1% derating per each add. 100 m                              |   |                  |               |               |               |
| INPUT   |   |   |                  |               |               |               |
| Rated input voltage                                 | 220/380 V; 230/400 V; 240/415 V   |   |                  |               |               |               |
| Voltage tolerance:                                  |   |   |                  |               |               |               |
| Rectifier input                                     | 187 to 276 V  |   |                  |               |               |               |
| Bypass input  | rated voltage -15% / +10%   |   |                  |               |               |               |
| Rated input frequency                               | 50 or 60 Hz, user configurable  |   |                  |               |               |               |
| Frequency tolerance                                 | 40 to 72 Hz   |   |                  |               |               |               |
| Input wiring  | 3 phases + neutral  |   |                  |               |               |               |
| Input power factor                                  | 0.99  |   |                  |               |               |               |
| Input ITHD  | 8 kW<br>< 5%  | 10 kW<br>< 4%                                   | 15-40 kW<br>< 3% |               |               |               |
| Rated input r.m.s. current                          | 8 kW<br>13 A  | 10 kW<br>16 A                                   | 15 kW<br>24 A    | 20 kW<br>32 A | 30 kW<br>48 A | 40 kW<br>63 A |
|   | 400V<br>12 A  | 15 A  | 23 A             | 30 A          | 46 A          | 61 A          |
|   | 415V<br>12 A  | 15 A  | 22 A             | 29 A          | 44 A          | 58 A          |
| Soft start capability                               | Yes   |   |                  |               |               |               |
| Back feed protection                                | Yes, for rectifier and bypass lines   |   |                  |               |               |               |

| OUTPUT                            |  |  |
|-----------------------------------|--|--|
| Output wiring                     | 3 phases + neutral   |  |
| Rated output voltage              | 220/380 V; 230/400 V; 240/415 V, configurable  |  |
| Total voltage harmonic distortion |  |  |
| 100% linear load                  | < 1%   |  |
| 100% non-linear load              | < 5%   |  |
| Overload capability               |  |  |
| On inverter                       | 10 min 102-110% load<br>60 sec 111-125% load<br>10 sec 126-150% load<br>300 ms >150% load  |  |
| On bypass                         | Continuous < 125% load<br>20 ms 1000% load   |  |
| Load power factor                 |  |  |
| Rated                             | 1.0  |  |
| Permitted range                   | 0.8 lagging to 0.8 leading   |  |
| BATTERY                           |  |  |
| Battery technology                | 12 V, VRLA   |  |
| Battery design life               | 5 or 10 years  |  |
| Battery quantity                  | 32 blocks, 192 cells per battery string  |  |
| Battery voltage                   | 384 V  |  |
| Nominal Ah capacity (C10)         | 9 Ah or 7 Ah Long life   |  |
| Charge current limit              | Default 5 A, configurable<br>Maximum 25 A  | Default 10 A, configurable<br>Maximum 50 A |
| Battery start option              | Yes  |  |
| COMMUNICATION CIRCUITS            |  |  |
| MiniSlot                          | 2 communication bays   |  |
| Network/SNMP interface            | Yes, standard  |  |
| Standard connectivity ports       | Mini-slot ports for optional cards, Device USB and Host USB, RS-232 service port, relay output, 5 building alarm inputs and a dedicated EPO, Web and SNMP card |  |
| COMPLIANCE WITH STANDARDS         |  |  |
| Safety (CB certified)             | IEC 62040-1  |  |
| EMC                               | IEC 62040-2  |  |
| Performance                       | IEC 62040-3  |  |

Eaton is dedicated to ensuring that reliable, efficient and safe power is available when it's needed most. With unparalleled knowledge of electrical power management across industries, experts at Eaton deliver customised, integrated solutions to solve our customers' most critical challenges.

Our focus is on delivering the right solution for the application. But decision makers demand more than just innovative products. They turn to Eaton for an unwavering commitment to personal support that makes customer success a top priority.







For more information, visit [www.eaton.eu/93PS](http://www.eaton.eu/93PS).

To contact an Eaton salesperson or local distributor/agent,  
please visit [www.eaton.eu/electrical/customersupport](http://www.eaton.eu/electrical/customersupport).