

Eaton 93E XS UPS

Simple Effective



EATON

Powering Business Worldwide

The Eaton 93E XS: simply effective

The Eaton 93E XS UPS delivers simply effective power protection for ever-expanding loads in today's space-constrained data centres. Facilitating a lower total cost of ownership (TCO) through a combination of energy-efficiency, high reliability and a compact footprint the 93E is an ideal solution for small to medium sized data centres and other applications desiring highly reliable power protection.



15/20/30/40 kVA

Energy-efficient design

With a transformer-free design and sophisticated sensing and control circuitry the 93E XS is capable of achieving up to a 99% efficiency rating, making it one of the most energy-efficient UPSs in its class - and it still provides maximum load protection. Unlike most high efficiency UPSs, the 93E XS:

- Provides surge suppression for the load
- Detects the location of faults (utility or load) and takes the appropriate action
- Switches to double-conversion operation in less than 4ms

High system efficiency reduces utility cost, extends battery run times and ensures cooler operating conditions.

Real compatibility

Active power factor correction (PFC) provides 0.99 input power factor and <5% ITHD, thus eliminating interference with other critical equipment in the same network and enhancing compatibility with generators. The 93E XS is optimised for protecting modern 0.9 p.f. rated equipment without the need to oversize.

True reliability

With a transformer-free design and sophisticated sensing and control circuitry the 93E XS is capable of achieving up to a 99% efficiency rating, making it one of the most energy-efficient UPSs in its class - and it still provides maximum load protection. Unlike most high efficiency UPSs, the 93E XS:

Compact & serviceable design

Small footprint occupies minimal floor space:

- Up to 60% smaller than similar competitive solutions
- Allows dedication of more floor space to revenue producing equipment

The 93E XS is easily and quickly serviced to provide the highest level of availability with Mean Time to Repair (MTTR) <30 minutes. With its Easy Capacity Test feature the 93E can test its entire power train under full load stress without the requirement of an external load.

Flexible installation options

Eaton's range of accessories for the 93E 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.

User Interface

Large LCD graphically displays UPS status and offers easy access to measurements, controls and settings.



Connectivity

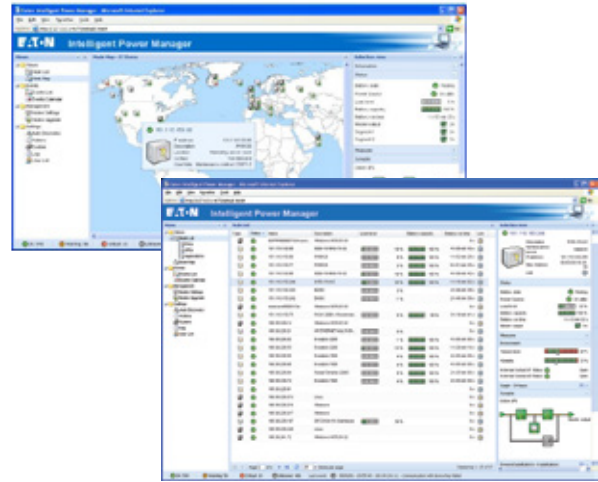
With Eaton® Mini-Slot connectivity cards, you can monitor, manage and remotely shutdown UPSs across the network.



- Network Card-MS Web/SNMP Card allows you to connect your 93E UPS directly to the Ethernet network and the Internet
- Network and MODBUS Card-MS provides remote monitoring of a UPS system through a Building Management System (BMS) or Industrial Automation System (IAS)
- Relay Card-MS provides the essential dry-contact interface between your Eaton UPS and any relay-connected computer as well as a variety of industrial applications

Software

Eaton's Intelligent Power® Software Suite incorporates two important applications for ensuring quality power and uptime: monitoring and management of power devices across the network combined with automatic, graceful shutdown when faced with an extended power outage.



- Monitor and manage multiple power devices across your network
- Extend the uptime of dual-powered servers with redundancy capabilities
- Enable server shutdown and live migration events

Eaton's heritage in industry-leading UPS design and production

For more than 50 years, Eaton has been safeguarding the critical systems of businesses across the globe. Whether protecting a single desktop or the largest data centre, Eaton solutions provide clean, uninterrupted power to keep mission-critical applications working.

We offer a comprehensive range of environmentally-sensitive, efficient, reliable UPSs, surge protective devices, power distribution units (PDUs), remote monitoring, meters, software, connectivity, enclosures, airflow management and professional services.

We work with IT and facilities managers to effectively manage power in virtually every business segment, including data centres, retail outlets, health-care

organisations, governmental agencies, manufacturing firms, broadcasting companies, financial institutions, and a wide variety of other applications. Our solutions provide the power to make a difference, helping you achieve your business goals while maintaining environmentally sustainable enterprises.

A world-class support structure

As an industry-leading UPS provider, at Eaton we're constantly working to ensure that our service standards meet your needs precisely. Our trained service team is on hand 24/7 to minimise risks by detecting and addressing problems before they happen. In the Asia Pacific region Eaton's service network consists of more than 200 field engineers who



receive comprehensive, up-to-date training on the latest products and technologies.

We confidently guarantee the experience and know-how of our servicing resources to provide a dedicated support package which helps to ensure your equipment is running safely, reliably, sustainably and energy-efficiently at all times.

Eaton 93E XS 15-40kVA UPS Technical Specification

CONSTRUCTION	15 KVA	20kVA	30kVA	40kVA
Mode	93E- 15/15	93E- 20/20	93E- 30/30	93E- 40/40
kVA/kW Rating (all modes)	15/13.5	20/18	30/27	40/36
Upgradability	20kVA			
UPS Topology	Double Conversion, IGBT Converters			
Performance classification	VFI-SS-111			
UPS Dimensions: WxDxH (mm)	350 x 796 x 800			
Degree of protection	IP20, with front door mounted washable dust filter (IP 21 optional)			
Cabinet colour	Black, RAL 9005			
Cable entry	Rear			
Weight (kg) without batteries	61	61	66.5	74.5
ENVIRONMENT				
Ambient storage temperature	Range of -15 to +55° C in the protective package			
Ambient service temperature	UPS: 0 to +40° C Battery: +5 to +25° C without reducing battery life			
Maximum service altitude	1000m above sea level. Maximum 2000m with 1% de-rating per each additional 100m above 1000m			
Relative humidity	5 to 95%, no condensation allowed			
Acoustic noise at 1m (ISO7779)	≤55dB @ 75% Load		≤60dB @ 75% Load	
Electromagnetic Compatibility	Immunity and emission to IEC/EN 62040-2			
USER INTERFACE & COMMUNICATIONS				
Display	Graphical LCD with blue backlight, 4x LEDs for notice and alarm			
Standard Communication Ports	2x Mini-Slot , 1x Emergency Power Off input (NC or NO), 3x Building Alarm inputs, 1x RS232 & 1x USB (exclusively for service tool use)			
Optional Communication Ports	Mini-Slot cards: Web/SNMP, Relay/RS232, Industrial Relay, ModBus			
ELECTRICAL INPUT CHARACTERISTICS				
Power Distribution System compatibility	TN, TN-S, TN-C, TN-C-S, TT (Three-phase, four-wire + PE)			
Rated input voltage and voltage tolerance	Rectifier: 230/400Vac nominal (220/380, 240/415 Selectable) 190/330–276/478V (-15%, +20%) at 100% load, 116/201-276/478V (-50%, +20%) at 50% load Bypass: 3 x 230/400V nominal (220/380, 240/415 Selectable) 207/359 – 253/438V (±10% of nominal, selectable up to ±20%)			
Operating frequency / tolerance	50 or 60Hz; Tolerance 42-72Hz			
Input current distortion	<5% THDi (Linear load or non-linear load condition at rated input current)			
Input power factor	0.99pf at 100% load			
Inrush current	≤120% of rated current for ≤2 cycles			
Number of input phases	3 phases + Neutral + PE (3 phase input)			
Rated rectifier input current (rms @ 400V)	23A	31A	46A	61A
Maximum rectifier input current (rms @ 400V)	25A	33A	49A	65A
Bypass input current (rms @ 400V) Recommended/Max	22/25A	29/33A	43/50A	58/66A
ELECTRICAL OUTPUT CHARACTERISTICS - NORMAL MODE				
Rated output voltage	230/400 Vac, three phase, (220/380, 240/415 selectable)			
Output voltage variation	±1% Balanced static load, ±6% with 5ms recovery from 10% to 90% load step, ±5% Balanced dynamic load (EN62040-3)			
Crest factor	3:1			
Rated output frequency	50 Hz (default) or 60 Hz			
Output frequency variation (synchronised if applicable)	±4Hz (default) selectable from ±1Hz to ±4Hz, with slew rate 0.5Hz/sec (default), 2.5Hz/s, or 7.5 Hz/s selectable			
Output frequency synchronised phase error at change of mode	Maximum of 2.5 degrees			
Total voltage distortion	<2% with linear load, <5% with non-linear load defined according to EN62040-3			
Short circuit capability, <400ms	80A	80A	120A	160A

Eaton 93E XS 15-40kVA UPS Technical Specification

	15 KVA	20kVA	30kVA	40kVA
Overload capacity w/out bypass	102–110% load 60 minutes, 111–125% load 10 minutes, 126–150% load 1 minute, >151% load 150ms at 40oC			
Overload capacity with bypass	115% load continuous, 1000% for 20ms at 40oC and ≤1000m altitude Note: Selected external Bypass fuses or breaker may limit the overload capability			
Load power factor range	0.7 lagging to 0.9 leading without de-rating			
Range of frequency synchronisation with bypass	±3Hz/s default, up to 7Hz/s user settable for single UPS, up to 0.5 Hz/s for parallel UPS			
ELECTRICAL OUTPUT CHARACTERISTICS - STORED ENERGY MODE				
Transfer to/from stored energy	No break			
Rated output voltage	230/400 Vac, three phase, (220/380, 240/415 selectable)			
Output voltage variation	±1% with Balanced static load, 0% during transfer from stored energy to normal mode, ±5% with 10ms recovery from 10% to 90% load step, ±5% Balanced dynamic load (EN62040-3)			
Crest factor	3:1			
Rated peak output voltage	325V, ±20V			
Rated output frequency	50Hz (default) or 60Hz			
Output frequency variation	±0.005Hz (single module), ±0.07Hz (Parallel system)			
Total output voltage distortion	<2% with linear load, <5% with non-linear load defined according to EN62040-3			
Short circuit capability, <400ms	80A	80A	120A	160A
Overload capability	102–125% load 1 minute, 126–150% load 30 seconds, >151% load 150ms at 40°C			
Load power factor range	0.7 lagging to 0.9 leading without de-rating			
EFFICIENCY (Input/Output)				
Linear Load, 25% load:	88.00%	90.00%	90.00%	90.00%
Double 50% load:	92.00%	92.50%	92.50%	92.50%
Conversion Mode 75% load:	93.50%	94.00%	94.00%	94.00%
@ 400V/50Hz 100% load:	94.00%	94.00%	94.00%	94.00%
Heat Dissipation 25% load:	460	500	750	1000
Double 50% load:	587	730	1095	1459
Conversion Mode 75% load:	704	862	1293	1723
@ 400V/50Hz 100% load:	862	1149	1723	2298
Linear Load, 100% load:				98.0%
HE Mode 50% load:				97.5%
BYPASS CHARACTERISTICS				
Automatic bypass	Static bypass switch, continuously rated*, no break transfer *bypass capable of 115% continuous load on 15-80kVA models			
Automatic bypass rating	30kVA			40kVA
Automatic bypass SCR i2t value	10200A2s			20,400 A2s
Back-feed protection	Optional Internal back-feed contactor			
Separate bypass input feed	Optional			
Manual bypass switch (internal)	Standard			
HE (High Efficiency) MODE CHARACTERISTICS				
Performance classification	VFD, transferring to VFI (Double Conversion mode) if limits are exceeded			
Transfer time Mains available: to VFI	No break (0ms)			
Mains failure	4ms typical, <10ms maximum			
Acceptable voltage variation	±10% of nominal voltage			
Acceptable output freq variation	±4Hz			
High Alert mode	UPS will stay in double-conversion mode for one hour (user adjustable), after which the unit will automatically return to operate in HE mode			
BATTERY				
Battery nominal voltage	384V (192 Cells) to 480V (240 Cells), 432V (216 Cells, Default)			
Float charge voltage	192–240 x 2.30V = 441.6–552V			
Maximum charge voltage	192–240 x 2.35V = 451.2–564V			
Battery cut off voltage	1.67V/Cell			
Restored energy time to 90%	Maximum 10 hours recommended (dependent on battery size)			
Charging current (at full load)	5.3A	5.3A	8A	10.6A
Battery recharge profile	Advanced Battery Management (ABM®) = 90% resting, 10% floating/charging (typical)			

Eaton 93E XS UPS Technical Specifications

Power

Ratings	15kVA/13.5kW 20kVA/18kW 30kVA/27kW 40kVA/36kW
Topology	Double-conversion online UPS
Operating frequency	50/60 Hz (40 to 72 Hz)
Input power factor	>0.99 typical
Input current distortion	≤5% THD

Electrical input

Nominal input voltage	400/230V, 4 wire (380/415V selectable)
Input voltage range	-15%, +20% from nominal (400V) at 100% load without depleting battery

Electrical output

Nominal output voltage	400/230, 4 wire (380/415V selectable)
Output voltage regulation	±1% Static; <5% dynamic at 100% resistive load change, <20 ms response time

Battery

Battery	192 to 240 Cells (Continual selectable)
Charging method	ABM Cyclic Charging

General

Efficiency	>98% High-efficiency mode >94% Double conversion mode
Overload	150% for 1 minute, 125% for 10 minutes, >150% for 150ms
UPS bypass	Automatic on overload or UPS failure
Parallel technology	Powerware Hot Sync® Technology
Dimensions W x D x H (mm)	350 x 796x 800
Cabinet rating	IP20 with standard washable dust filters
Weight	61kg 15/20kVA 66.5kg 30kVA 74.5kg 40kVA

Communications

Display	Graphical LCD with blue backlight
LEDs	(4) LEDs for notice and alarm
Audible alarms	Yes
Communication ports	(1) RS-232, (1) USB, (1) EPO
Communication slots	(2) Mini-slot communication bays

Environmental

Operating temperature	0°C to +40°C Batteries recommended max. +25°C
Storage temperature	-25°C to +55°C without batteries
Relative humidity	5-95%, non-condensing
Audible noise	15-20kVA ≤55 dBA at 1m typical 30-40kVA ≤62 dBA at 1m typical
Altitude	<1000m at +40°C

Certifications

EMI standards	EN55022/EN55024
EMC compliance	IEC 62040-2
Quality	ISO 9001: 2000 and ISO 14001:1996

Communication accessories

Network-MS	Web/SNMP Card
Modbus-MS	Web/SNMP and Modbus Card
Relay-MS	Relay (Dry Contact) Card -DB9 Connection
Industrial Relay	Relay (Dry Contact) Card -Terminal Connection
116750224-001	Environmental Monitor Probe (EMP) kit (need to plug into Web/SNMP Card or Web/SNMP and Modbus Card to work

System accessories

Maintenance Bypass Switches (MBS) (Standard)
Dual input kit (Standard)

Due to continuous product improvements, specifications are subject to change without notice.

For more information visit: eaton.com