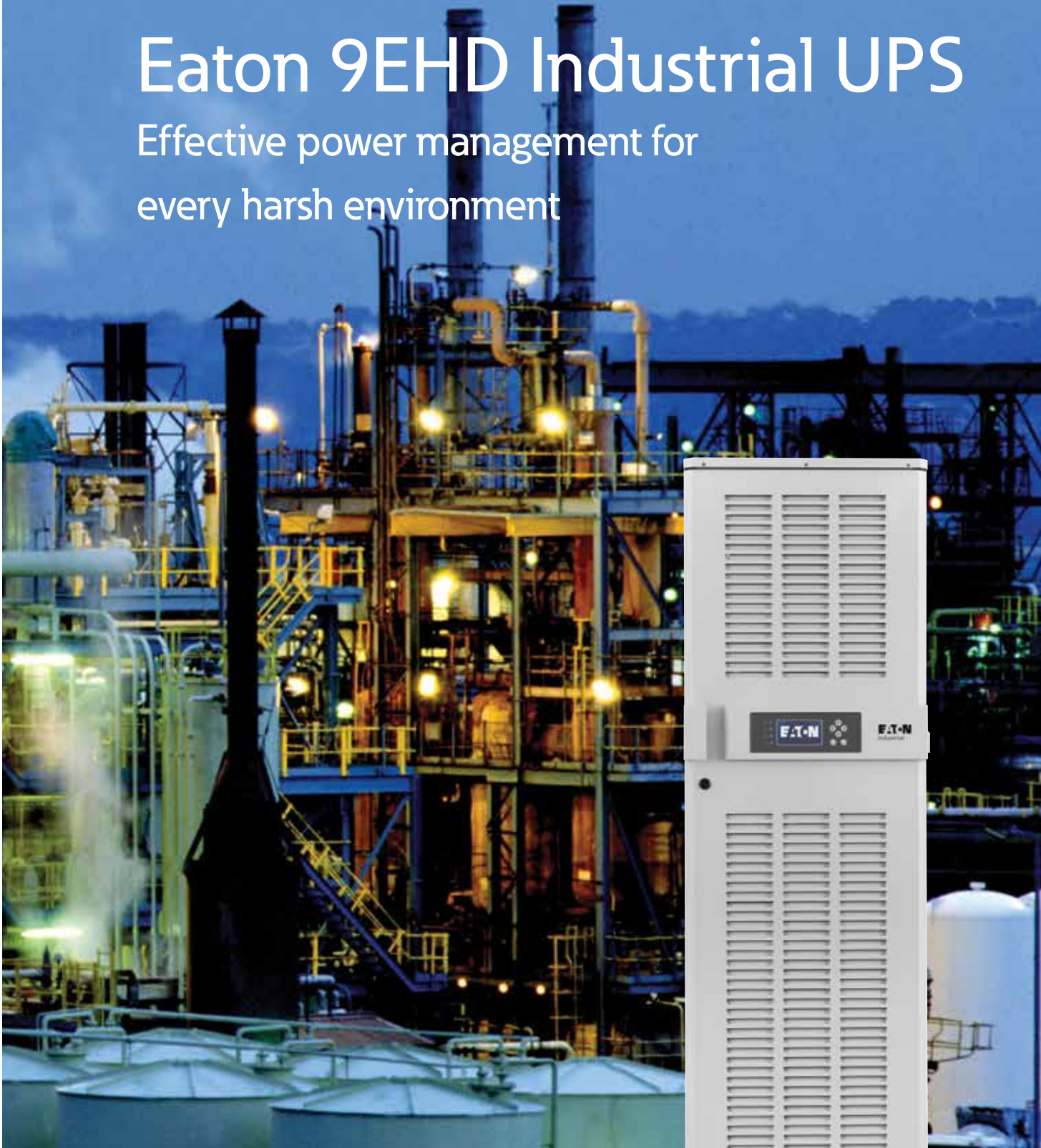


Power Quality Solution

# Eaton 9EHD Industrial UPS

Effective power management for  
every harsh environment



**EATON**

*Powering Business Worldwide*

# Innovation design for the most demanding applications

Eaton's rugged products, innovative designs and advanced solutions deliver performance and uptime for continuous operation in the toughest environments. Our robust portfolio drives energy efficiency, maximises uptime and increases productivity, keeping your demanding operation running profitably. Eaton integrates a full line of uninterruptible power systems, power conversion products, power management software, remote monitoring, turnkey integration services and site support.

The new Eaton®93i uninterruptible power system (UPS) with its effective power management and innovative design provides the highest level of protection for the most demanding applications to meet every harsh environment. The 93i comes in two models to satisfy needs for ever-expanding loads:

## **Eaton 9EHD-31 from 10 – 100 kVA**

This single-phase output UPS specifically designed to provide critical power protection for a wide range of applications.

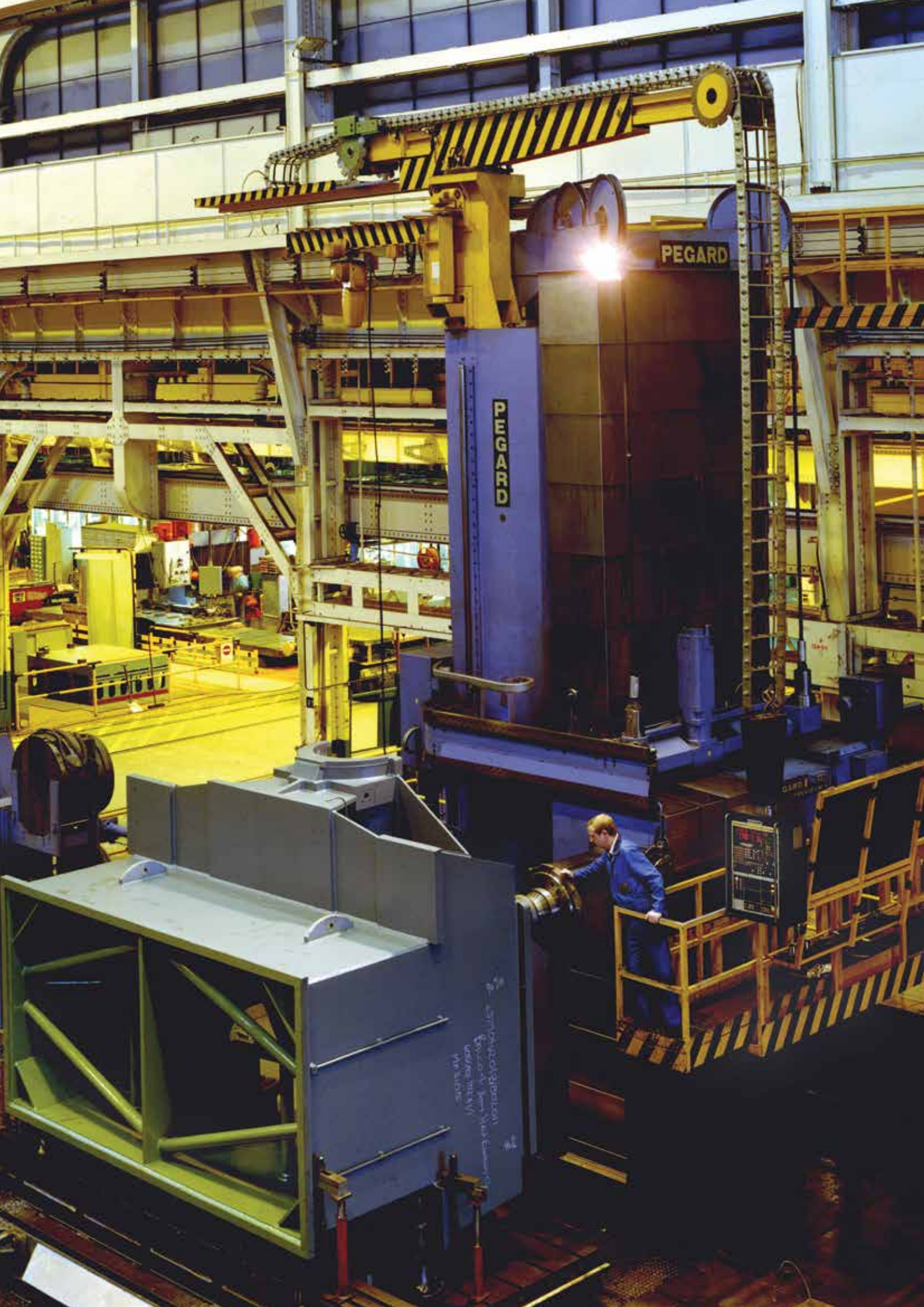
## **Eaton 9EHD-33 from 10 – 200 kVA**

This three-phase output UPS with online double conversion UPS combining high reliability and high power availability with low total cost of ownership and low carbon footprint.

## Key applications

- Manufacturing
- Medical
- Offshore and onshore application
- Refining and petrochemical
- Transportation
- Security
- Utilities (water treatment and desalination)





PEGARD

PEGARD

Simplex-Optimat  
Länge: 10,0 m  
Nennleistung: 100 kW  
Mittelspannung

# Technology

Eaton can address the issues you care about; keeping machines running, streamlining your processes and making workers safe. We have worked with industrial customers over the years and they all face similar concerns.

The Eaton 93i UPS is designed to meet the most stringent industry standards. The double conversion online topology provides the highest level of protection available by isolating the output power from all input anomalies.

## Low TCO through sustainable design

With a transformer-free design and sophisticated sensing and control circuitry, the 9EHD is capable of achieving up to a 98% 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 9EHD:

- 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.

## Premium power performance and true reliability

Active power factor correction (PFC) provides 0.9 input power factor and <5% ITHD, thus eliminating interference with other critical equipment. With these features, TCO can be further reduced as”

- No generator and cable oversizing is needed
- No requirement for reactive power compensation nor harmonic filtering

## Serviceable design

The 9EHD is easily and quickly serviced to provide the highest level of availability with Mean Time to Repair (MTTR) <30 minutes.

## User interface

Large LCD graphically displays UPS status and offers easy access to measurements, controls and settings. It's event log can analysis:

- Up to 512 events
- Date and time stamp



## 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



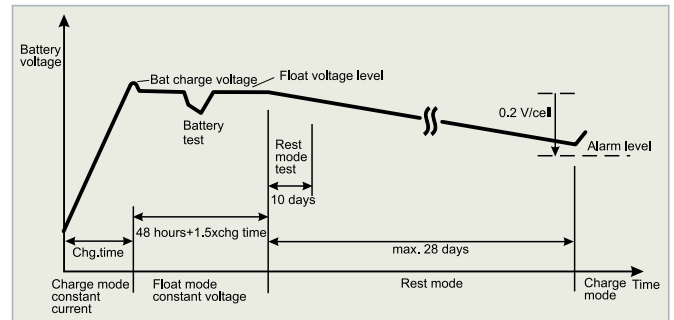
# Effective power technology for the harsh environment

## ABM technology—extend your battery life and optimize recharge time

Most UPS manufacturers offer constant trickle-charge on their batteries, which degrades them and reduces their service life by as much as 50 percent. In contrast, Eaton’s ABM technology uses sophisticated sensing circuitry and an innovative three-stage charging technique that extends the useful service life of UPS batteries while optimizing battery recharge time. It also provides advance notice of the end of useful battery service life to allow you ample time to hot-swap batteries without ever having to shut down connected equipment.

## Load segments—extend battery time when necessary

Using our protection software, you can independently control load segments, which are groups of receptacles on the rear panel of the UPS. This feature enables you to maximize battery power and provide orderly shutdown and startup of critical equipment. During a power outage, you can shut down non-critical devices, extending available battery time to critical equipment.



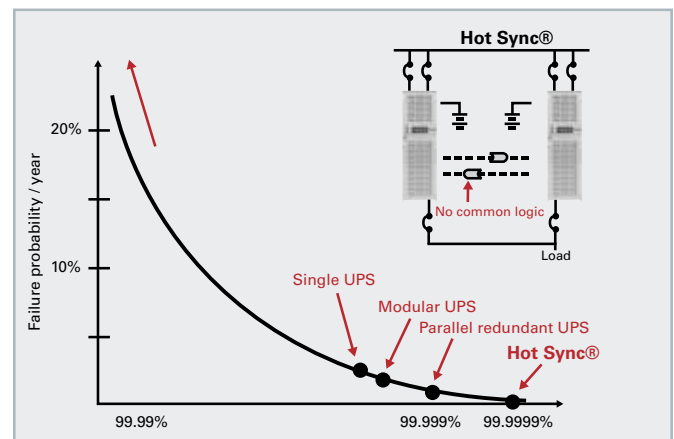
Battery voltage during ABM charging process

## Increase your reliability

Eaton’s unique, patented Hot Sync wireless paralleling technology ensures high reliability in systems with multiple Uninterruptible Power Modules. Patented, and proven in thousands of systems worldwide, Hot Sync enables paralleled UPMs to operate completely independently, so there is no risk of a domino effect with one module affecting or interfering with another. There is also no system-level single point of failure. With Hot Sync, any standard UPS can be used in a parallel system without modification, and with no additional circuitry required. The 93PM UPS can also be configured with inherent redundancy, to avoid under-loading and associated reduced efficiency and reliability.

### Key design features of Hot Sync systems

- No system-level single point of failure
- Paralleled UPMs operate completely independently. One module cannot affect or interfere with the others – no domino effect scenario
- No added circuitry is required for parallel operation. Any standard UPS can be used in a parallel system without modification
- This patented and proven technology has been successfully deployed in thousands of systems around the world



Patented Hot Sync technology provides highest availability for load

# Eaton 9EHD-31 Single Phase output UPS

## TECHNICAL SPECIFICATION ; SINGLE PHASE OUTPUT

POWER	10kVA	20kVA	30kVA	40kVA	60kVA	80kVA	100kVA	
Model:	931i							
kVA/KW Rating (all modes)	10/9	20/18	30/27	40/36	60/54	80/72	100/90	
UPS Topology	Double Conversion, IGBT Converters							
Classification	EN62040-3 Class1 (VFI-SS-111)							
UPS Dimensions: W x D x H (mm)	500*710*1000		500*710*1230		500*710*1500			600*855*1880
Degree of protection	IP32 (standard), IP42 (optional)							
Cable Entry	Bottom/ Rear							
Conformal coating	PCBA conformal coating							
Colour	RAL 7035							
Weight (kg) without batteries	72	88	114	262	282	306	306	
<b>ENVIRONMENT</b>								
Ambient storage temperature	Range of -25 to +55°C in the protective package							
Ambient service temperature	Power electronics part: 0 to +40°C (0-50°C with derating) Battery part: +5 to +25°C without reducing battery life							
Maximum service altitude	1000m at 40°C Maximum 2000m with 1% de-rating per each additional 100m above 1000m							
Relative humidity	5 to 95%, Non-condensing							
Audible noise at 1m @ 100% Load (ISO7779)	<60dBA	<65dBA		<70dBA			≤70dBA	
Electromagnetic Compatibility	Immunity and emission to IEC/EN 62040-2							
<b>USER INTERFACE &amp; COMMUNICATIONS</b>								
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)							
<b>ELECTRICAL INPUT CHARACTERISTICS</b>								
AC Power Distribution System compatibility	TN, TN-S, TN-C, TN-CS, TT (Three-phase,4-wire+PE)							
Rated input voltage and voltage tolerance	<u>Rectifier:</u> 230/400Vac nominal (220/380, 240/415 Selectable) Tolerance: 190/330-276/478V (-15%, +20%) at 100% load, 116/201-276/478V (-50%, +20%) at 50% load <u>Bypass:</u> 3 x 230/400V nominal (220/380, 240/415 Selectable) Tolerance: 207/359-253/438V (±10% of nominal, selectable up to ±20%)							
Operating Frequency / Tolerance	50 or 60Hz ; Tolerance 42-70Hz							
Input current distortion	<5% THDi (Linear load condition at rated input current)							
Input power factor	0.99PF at 100% load							
<b>ELECTRICAL OUTPUT CHARACTERISTICS</b>								
Rated output voltage	230/220/240Vac, single phase,							
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)							
Max output frequency slew rate	0.5Hz/s (default), 2.5Hz/s, or 7.5 Hz/s							
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							
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							
Overload capacity without bypass	102-125% load 10 minutes, 126-150% load 1 minute, >150% load 150msec at 30oC							
Load power factor range	0.7 lagging to 0.9 leading							
<b>BYPASS CHARACTERISTICS</b>								
Automatic bypass	Static bypass switch, continuously rated*, no break transfer							

# Eaton 9EHD-33 Three Phase output UPS

## TECHNICAL SPECIFICATION

POWER	10kVA	20kVA	30kVA	40kVA	60kVA	80kVA	100kVA	150kVA	200kVA
Model:	933i								
kVA/KW Rating (all modes)	10/9	20/18	30/27	40/36	60/54	80/72	100/90	150/135	200/180
UPS Topology	Double Conversion, IGBT Converters								
Classification	EN62040-3 Class1 (VFI-SS-111)								
UPS Dimensions: W x D x H (mm)	500*710* 1000	500*710* 1230	500*710* 1500	600*855*1880			900*800* 1880	1600*820* 1880	
Degree of protection	IP32(standard), IP42(optional)								
Cable Entry	Bottom/ Rear								
Conformal coating	PCBA conformal coating								
Colour	RAL 7035								
Weight (kg) without batteries	72	88	114	262	282	306	306	457	457
<b>ENVIRONMENT</b>									
Ambient storage temperature	Range of -25 to +55°C in the protective package								
Ambient service temperature	Power electronics part: 0 to +40°C (0-50°C with derating) Battery part: +5 to +25°C without reducing battery life								
Maximum service altitude	1000m at 40°C Maximum 2000m with 1% de-rating per each additional 100m above 1000m								
Relative humidity	5 to 95%, Non-condensing								
Audible noise at 1m @ 100% Load (ISO7779)	<60dBA		<65dBA		<70dBA			≤70dBA	
Electromagnetic Compatibility	Immunity and emission to IEC/EN 62040-2								
<b>USER INTERFACE &amp; COMMUNICATIONS</b>									
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)								
<b>ELECTRICAL INPUT CHARACTERISTICS</b>									
AC Power Distribution System compatibility	TN, TN-S, TN-C, TN-CS, TT, Three-phase,4-wire+PE,								
Rated input voltage and voltage tolerance	Rectifier: 230/400Vac nominal (220/380, 240/415 Selectable) Tolerance: 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) Tolerance: 207/359-253/438V (±10% of nominal, selectable up to ±20%)								
Operating Frequency / Tolerance	50 or 60Hz ; Tolerance 42-70Hz								
Input current distortion	<5% THDi (Linear load condition at rated input current)								
Input power factor	0.99PF at 100% load								
<b>ELECTRICAL OUTPUT CHARACTERISTICS</b>									
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)								
Max output frequency slew rate	0.5Hz/s (default), 2.5Hz/s, or 7.5 Hz/s								
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								
Output frequency synchronised phase error at change of mode	Maximum of 2.5 degrees								
Total voltage distortion	<2% with linear load, <7.5% with non-linear load defined according to EN62040-3								
Overload capacity without bypass	102-125% load 10 minutes, 126-150% load 1 minute, >150% load 150msec at 30oC								
Load power factor range	0.7 lagging to 0.9 leading								
<b>BYPASS CHARACTERISTICS</b>									
Automatic bypass	Static bypass switch, continuously rated*, no break transfer								
<b>BATTERY</b>									
DC voltage	220Vdc/ 400Vdc								
Type of batteries	Nickel cadmium / Lead Acid								
<b>OPTIONAL FEATURES</b>									
Transformer	Internal output transformer Input transformer cabinet Bypass transformer								
Power distribution	Rectifier input breaker, Bypass breaker, Output breaker, Maintenance bypass breaker , Output load distribution breakers								
Lighting inside panel	Lighting inside cabinet for service convenience								
Back-feed protection	Internal back-feed contactor								
User interface and communication	Mini-Slot cards: Web/SNMP, Relay/RS232, Industrial Relay, ModBus								
<b>CERTIFICATION</b>									
Safety Certification	UL 1778								
EMI Standards	EN55022 / EN55024								
EMC Compliance	IEC 62040-2								
Quality	ISO 9001:2000 and ISO 14001:1996								
Marking	UL, cUL, CE								

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.com/powerquality](http://www.eaton.com/powerquality)

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