


## Eaton® 93PR 1200kVA Modular UPS Technical Specification

Model	60-1200kW
Catalog	93PR-1200
Outlook	 <p style="text-align: center;">(default: GLACIER WHITE, optional: black)</p>
UPM Rating (all operating modes)	62.5kVA/62.5kW at 230VAC, 30°C 60kVA/60kW at 230VAC, 35°C 55kVA/55kW at 230VAC, 40°C
UPS Rating (all operating modes)	1250kVA/1200kW at 230VAC, 30°C 1200kVA/1200kW at 230VAC, 35°C 1100kVA/1100kW at 220/230VAC, 40°C
Configurable Upgradability	60kW*N (1≤N≤20), 62.5kW*N (1≤N≤19)
Parallel Capability	4 x parallel, maximum 4.8MW
UPS Topology	Double Conversion, IGBT Module Converters, three level Static UPS
Performance classification	VFI-SS-111, IEC62040-3
UPM Dimensions: W x D x H (mm)	439 x 700 x 173.4 (4U height) 590 x 980 x 325 (Packaged)
UPM Weight	39kg Net, 44kg Gross, Modules shipped separately
UPS Dimensions: W x D x H (mm)	2400 x 1100 x 2069 (4x19" frame unpackaged) Shipped in 2 parts
Frame Weight (kg)	1528 kg
Degree of protection	IP20, with front door washable dust filter
Cabinet color theme	Default: Eaton White, Optional: Black, RAL 9005
Switchgear (Internal)	None Internal Backfeed protection
Cable entry	Top entry and top/front access
Ventilation	Rear exhaust standard, top exhaust optional
Accessories	Top Exhaust Kits Load Sync Box
<b>ENVIRONMENT</b>	
Ambient storage temperature	Range of -25 to +55°C in the protective package
Ambient service temperature	1250kVA/1200kW at 230VAC, 30°C 1200kVA/1200kW at 230VAC, 35°C 1100kVA/1100kW at 220/230VAC, 40°C

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Maximum service altitude	1000m above sea level. Maximum 2000m with 1% de-rating per each additional 100m above
Relative humidity	+5% to 95%, no condensation allowed
Acoustic noise at 1m	75~80dBA
Electromagnetic Compatibility	Immunity and emission to IEC/EN 62040-2 C3

### USER INTERFACE & COMMUNICATIONS

Display	7" Touchscreen Color display and 4 separate summary LEDs for system status Door mounted LED bars for long range view of system status
Standard Communication Ports	3x Mini-Slot, 1x EPO input (NC or NO), 1x Relay output (NO/NC), 5x Building Alarm inputs, 1x USB Host, 1x USB Slave, 1x RS232 Service Port
Optional Connectivity Options	Web/SNMP Relay/RS232 Industrial Relay PXGMS Industrial Gateway Card, PXGMS, SNMP/Modbus/BACnet

### ELECTRICAL INPUT CHARACTERISTICS

Earthing 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) Tolerance: (-10%, +10%) at 100% load (-40%, +20%) at 50% load without battery discharge Bypass: 230/400Vac nominal (220/380, 240/415 Selectable) Tolerance: 196/340 – 253/438V
Operating frequency / tolerance	50 or 60Hz; Tolerance 40-72Hz
Input current distortion	<3% THD (Linear load condition at rated input current)
Input power factor	>0.99pf @ 20-100% load, >0.95 @ 10-20% load
Inrush current	<50A
Rectifier ramp-up, rectifier start and load step (UPM)	<100% of rated current. Rectifier ramp-up 10A/s (default), configurable, min. 1A/s
Number of input phases	3 phases + Neutral (3-Wire configuration is available as optional)
Rated rectifier input current @ 400V	1504A @1000kW 1654A @1100kW 1805A @1200kW
Max. rectifier input current @ 400V	1900A
Bypass input current (rms @ 400V) Recommended/Maximum	1444A (1000kVA Rated) 1594A (1100kVA Rated) 1740A (1200kVA Rated) 1833A (1250kVA Rated) 2100A (Maximum)

### ELECTRICAL OUTPUT CHARACTERISTICS - NORMAL MODE

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Rated output voltage	230/400Vac, three phases
Output voltage variation	<1% static load, 4% with 50ms recovery from 100% load step
Crest factor	3:1
Rated output frequency	50Hz (default) or 60Hz
Output frequency variation	+/-0.1Hz with slew rate 1Hz/s
Total output voltage distortion	<1% linear load, <3% non-linear load
Short circuit capability	2 x I <sub>n</sub> per 60kVA rated module 2.5 x I <sub>n</sub> per 50kVA rated module
Fault clearing capability (without bypass)	180A*N gL/gG fuse (N stands for installed UPM number)
Overload capacity without bypass	30min >102–110% load 10min >111–125% load 30sec >126-150% load 300ms >150% load
Overload capacity with bypass	Continuous >100–115% load, 10ms 1000% load *Selected external Bypass fuses or breaker may limit the overload capability
Load power factor range	0.8 lagging to 0.8 leading without de-rating
Range of frequency sync with bypass	±4Hz as default. User settable 0.5 to 5 Hz

### ELECTRICAL OUTPUT CHARACTERISTICS - STORED ENERGY MODE

Transfer to/from stored energy	No break
Rated output voltage	220/380, 230/400, 240/415Vac, three phases
Output voltage variation	<2% static load, 4% with 50ms recovery from 100% load step
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	5%
Short circuit capability	250Amp per UPM, 400ms
Fault clearing capability	1400*2 gL/gG fuse
Overload capability	10 min 102–110% load 60secs 110%~125% load 10s 126%~150% 300ms >150%
Load power factor range	0.8 lagging to 0.8 leading without de-rating
Number of output phases	3 Phase + Neutral

### EFFICIENCY (Input/Output)

		55kW X 20	60kW X 20 / 62.5kW X 19
Linear Load	100% load:	96%	96%
Efficiency, Double Conversion Mode	75% load:	96.5%	96.5%
	50% load:	97%	97%

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@ 400V/50Hz	25% load:	95.8%	96%
Heat Dissipation, Double	100% load:	40kW	48kW
	75% load:	26.25kW	31.5kW
Conversion Mode	50% load:	16.5kW	19.8kW
@ 400V/50Hz	25% load:	10kW	12kW
Linear Load	100% load:	99.2%	99.2%
Efficiency, ESS	75% load:	99.2%	99.2%
Mode @	50% load:	99.0%	99.0%
400V/50Hz	25% load:	98.4%	98.6%
Air Flow	(m <sup>3</sup> /h):	9693	10051
	L/s:	2694	2792

### BYPASS CHARACTERISTICS

Automatic bypass	2 x Static bypass switch, continuously rated, no break transfer
Automatic bypass nominal rating	Maximum 1200kW (6 x 600kW)
Automatic bypass thyristor i <sup>2</sup> t value	4900000 A <sup>2</sup> s
Bypass fuse	1400A *2
Back-feed protection	Internal back-feed contactor as a standard
Separate bypass input feed	Standard (single feed cable links fitted on site)
Manual bypass switch	External LV cabinet equipped

### ESS (Energy Saver System) MODE CHARACTERISTICS

Performance classification	VFD, transferring to VFI (Double Conversion mode) if limits are exceeded
Transfer time to double conversion	Mains available: No break (0ms), Mains failure: 2ms typical
Acceptable output voltage variation	±10% of nominal voltage
Acceptable output freq. variation	±3Hz
UPS Audible Noise	<70dBA @ 1m in 25°C ambient temperature
Storm Detection	UPS locks into double-conversion mode when three power line disturbances have forced the unit to double-conversion three times (user adjustable) within a one-hour period (user adjustable)
High Alert mode	UPS will stay on double-conversion for one hour (user adjustable), after which the unit will automatically return to operate in ESS mode

### BATTERY

Battery nominal voltage	432V (36 x 12V, 216 Cells) 50kW UPM 456V (38 x 12V, 228 Cells) 55kW UPM 480V (40 x 12V, 240 Cells) 60kW UPM Other configurations as optional
Float charge voltage	216 x 2.30V = 497Vdc 50kW UPM 228 x 2.30V = 524Vdc 55kW UPM 240 x 2.30V = 552Vdc 60kW UPM
End of Discharge Voltage	216 x 1.67V = 360Vdc 50kW UPM 228 x 1.67V = 380Vdc 55kW UPM

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	240 x 1.67V = 400Vdc 60kW UPM
Maximum charge voltage	VRLA: 294 x 2.35V = 690Vdc (ABM enabled) Lithium: 700Vdc
Battery technology	2-wire, no centre tapping required Valve Regulated Lead Acid Ni-Cad Certified Lithium-ion battery
Stored energy time	No limitation within allowable ambient temperature.
Charging current (Default/Maximum)	25A default, Maximum 40A Per UPM, future extend to 60A by firmware upgrade
Restored energy time to 90%	Typically, 10 x Discharge time
Battery recharge profile	Advanced Battery Management (ABM®) = 90% resting, 10% floating/charging
VRLA Battery cut off voltage	The total Battery voltage is limited by EOD 1.67 to 1.75 VPC, Configurable or automatic (load adaptive)
Battery cold start	Support
Common battery	Common for internal parallel UPM
Battery Trip	+48V Shunt trip by default
Battery Auxiliary	Standard Equipped

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