

Eaton 93PM Scalable to 200kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	50(200)kW	100(200)kW	150(200)kW
	Model catalogue reference	93PM-50(200)	93PM-100(200)	93PM-150(200)
	UPS options	External maintenance bypass switch External battery cabinets Top air exhaust kit		
	Upgradability	To 100, 150 or 200kW	To 150 or 200kW	To 200kW
5.1.1	UPS topology	Double conversion, IGBT converters		
5.3.4	UPS performance classification	VFI-SS-111		

MECHANICAL

	UPS dimensions (width x depth x height)	760 x 914 x 1876 mm		
	Weight, UPS	346 kg	408 kg	471 kg
	Large External Battery Cabinet dimensions (width x depth x height)	1086 x 914 x 1876 mm		
	UPS Cable entry	Bottom entry or Bottom rear entry and Top entry as standard.		
	UPS Degree of protection	IP 21		
	UPS colour	Black; RAL 9005		
	Mean time to repair (MTTR)	30 minutes		

ENVIRONMENTAL

6.5.5	Acoustic noise at 1 m, in 25 °C ambient temperature	< 60 dBA in double conversion < 47 dBA in ESS	< 65 dBA in double conversion < 47 dBA in ESS
4.1.4	Ambient UPS storage temperature range	- 25 °C to + 55 °C in the protective package	
4.2.1.1 and 5.4.2.2 h	Ambient service temperature range UPS Battery	+ 5 °C to + 40 °C* <i>*No output power derating required.</i> + 20 °C to + 25 °C recommended for optimized battery life time	
4.2.1.1	Relative humidity range	5 to 95%, no condensation allowed	
4.2.1.2	Maximum service altitude	1000 m (3300 ft) above sea level Maximum 2000 m (6600 ft) with 1% derating per each add. 100m	

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EFFICIENCY

5.3.2 r and 6.4.1.6	Efficiency in double-conversion, rated linear load 100% load 75% load 50% load 25% load	96,3% 96,6% 96,6% 95,7%	96,4% 96,6% 96,7% 96,1%	96,5% 96,7% 96,7% 96,1%
	Heat dissipation in double conversion 100% load 75% load 50% load 25% load	1877 W 1328 W 891 W 559 W	3734 W 2640 W 1706 W 1041 W	5440 W 3839 W 2559 W 1690 W
	Efficiency in ESS, rated linear load 100% load 75% load 50% load 25% load	99,2% 99,2% 99,0% 98,6%	99,2% 99,2% 99,0% 98,6%	99,2% 99,2% 99,0% 98,6%

ELECTRICAL CHARACTERISTICS

INPUT

5.2.1.a and 5.2.1.b	Rated input voltage Voltage tolerance Rectifier input Bypass input	220/380V; 230/400 V; 240/415 V 230 V -15% / +20% 230 V -15% / +10%		
5.2.1.c and 5.2.1.d	Rated input frequency Frequency tolerance	50 or 60 Hz, user configurable 40 to 72 Hz		
5.2.2.a and 5.2.2.b	Number of input phases Rectifier input Bypass input	3 phases + neutral 3 phases + neutral		
5.2.2.d	Input power factor, double conversion mode 25-100% load 10-25% load	> 0,99 > 0,94		
5.2.2.c	Rated input current	80 A r.m.s (380 V) 76 A r.m.s (400 V) 73 A r.m.s (415 V)	159 A r.m.s (380V) 151 A r.m.s (400V) 145 A r.m.s (415V)	238 A r.m.s (380V) 226 A r.m.s (400V) 217 A r.m.s (415V)
5.2.2.f	Maximum input current	95 A	200 A	300 A
5.2.2.h and 5.2.2.i	Input current distortion at rated input current	< 3%		

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5.2.2 e	Inrush current	≤ 145 A	≤ 150 A	≤ 180 A
5.2.2 k	AC power distribution system compatibility		TN, TT and IT	
	Rectifier ramp-up, rectifier start and load step		10 A/s (default), configurable. Minimum 1 A/s.	
	Backfeed protection		Yes, internal as standard.	

ELECTRICAL CHARACTERISTICS

OUTPUT

5.3.2 f	Number of output phases	3 phases + neutral		
	Crest factor	3		
5.3.2 b	Rated output voltage	220/380 V; 230/400 V; 240/415 V, configurable		
5.3.2 b	Output voltage variation, steady state	< 1%		
5.3.2 i	Total voltage harmonic distortion 100% linear load 100% non-linear load	≤ 1,2% ≤ 5%		
5.3.2 q	Voltage unbalance at reference unbalanced load Phase displacement at reference unbalanced load	< 0,6% < 1,0°		
5.3.2 j	Voltage transient (r.m.s) at 100% step load Recovery time to steady state at 100% step load	4% 50 ms		
5.3.2 c	Rated output frequency Output frequency variation Slew rate	50 or 60 Hz, configurable ± 0,01 Hz 1 Hz/s		
5.3.2 d and 5.3.2 e	Maximum frequency range for synchronization with bypass Maximum synchronized phase error Maximum slew-rate when synchronizing	± 4 Hz as default. User settable 0,5 to 5 Hz. < 1° with static balanced load 1 Hz/s		
5.3.2 k	Rated output power	50kW / 50kVA	100kW / 100kVA	150kW / 150kVA
5.3.2 l	Overload capability On inverter	10 min 102-110% load 60 sec 111-125% load 10 sec 126-150% load 400 ms >150% load		

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	Overload capability On inverter, stored energy mode	10 min 102-110% load 60 sec 111-125% load 400 ms >126% load		
	Overload capability On bypass	Continuous < 125% load 10 ms 1000% load		
5.3.2 m	Output current limitation, short-circuit capability	170 A, 400 ms	345 A, 400 ms	510 A, 400 ms
6.4.2.10.3 and 6.4.2.10.4	Fault clearing capability	35 A gL/gG		63 A gL/gG
5.3.2 o and 5.3.2 p	Load power factor Rated Permitted range	1.0 0.8 lagging to 0.8 leading		

ESS MODE CHARACTERISTICS

	Transfer time to double-conversion Mains available Mains failure	No break Typically 2 ms
	Output voltage variation setting	±10% of nominal voltage, default
	Output frequency variation setting	± 4 Hz, default
	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 on ESS.

BYPASS

Type of bypass	Static		
Bypass rating	200 kW		
Bypass voltage range	220/380 V; 230/400 V; 240/415 V tolerance -15% / +10% of 230V		
Transfer time break	No break		
Bypass fuse pre-arc i^2t value	69 500 A ² s		
Maintenance bypass	Option; external		
Required external bypass protective fuse, recommended rating	3 x 400 A	3 x 400 A	3 x 400 A

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BATTERY CHARACTERISTICS

5.4.2.2 d	Battery technology	12 V, VRLA		
5.4.2.2 b	Battery quantity	36 blocks, 216 cells per battery string or 40 blocks, 240 cells per battery string		
5.4.2.2 c	Battery voltage	432 V (36 blocks) or 480V (40 blocks)		
5.4.2.2 f	Stored energy time	See separate declaration		
5.4.2.2 o	Recharge profile	ABM or float		
5.4.2.2 q	End of discharge voltage	1.67 VPC to 1.75 VPC Configurable or automatic (load adaptive)		
5.4.2.2 r	Charge current limit at nominal load	Default 12 A, configurable Maximum 16,5 A	Default 24 A, configurable Maximum 33 A	Default 36 A, configurable Maximum 49,5 A
	Battery start option	Yes		

COMMUNICATION CIRCUITS

5.6	Standard connectivity ports	Device USB and Host USB, RS-232 service port, relay output, 5 building alarm inputs and a dedicated EPO Web and SNMP card
	Complete list of indications and interface devices	See User's Manual

COMPLIANCE WITH STANDARDS

IEC 62040-1	Safety Degree of protection	Restricted access IP 21; protection against medium sized foreign matter (incl. finger), protection against vertically dripping water.
IEC 62040-2	Electromagnetic Compatibility Immunity Emissions	EMC Category C3 EMC Category C3

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