Eaton 93PM 160-200kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	160kW	200kW

	Model catalogue reference	93PM-160(200)	93PM-200(200)
	UPS options	External maintenance bypass switch External battery cabinets	
	Upgradability	Yes, up to 200 kW	-
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	556 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	< 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* **No output power derating required.* + 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	96,6%	96,4%
	75% load	96,7%	96,6%
	50% load	96,6%	96,7%
	25% load	95,3%	95,9%
	Heat dissipation in double conversion 100% load	5630 W	7200 W
	75% load	4100 W	5100 W
	50% load	2820 W	3300 W
	25% load	1970 W	2050 W
	Efficiency in ESS, rated linear load 100% load	99,2%	99,2%
	75% load	99,1%	99,2%
	50% load	99,0%	99,0%
	25% load	98,4%	98,6%
ELECTRICAL CHARACTERISTICS			
	INPUT		
5.2.1.a and 5.2.1 b	Rated input voltage	220/380V; 230/400 V; 240/415 V	
	Voltage tolerance Rectifier input	230 V -15% / +20%	
	Bypass input	230 V -15% / +10%	
5.2.1 c and 5.2.1 d	Rated input frequency	50 or 60 Hz, user configurable	
	Frequency tolerance	40 to 72 Hz	
5.2.2 a and 5.2.2 b	Number of input phases		
	Rectifier input	3 phases + neutral	
	Bypass input	3 phases + neutral	
5.2.2 d	Input power factor, double conversion mode		
	25-100% load	> 0,99	
	10-25% load	> 0,94	
5.2.2 c	Rated input current	254 A r.m.s (380V) 241 A r.m.s (400V) 232 A r.m.s (415V)	317 A r.m.s (380V) 301 A r.m.s (400V) 290 A r.m.s (415V)

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5.2.2 f	Maximum input current	400 A	
5.2.2 h and 5.2.2. i	Input current distortion at rated input current	< 3%	
5.2.2 e	Inrush current	≤380 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	160kW / 160kVA	200kW / 200kVA

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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	
	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	670 A, 400 ms	670 A, 400 ms
6.4.2.10.3 and 6.4.2.10.4	Fault clearing capability	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	

EARTH LEAKAGE CURRENTS		
	Protective conductor current, at full resistive load Online Bypass Stored Energy	3.7 A 1,2 A

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.

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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 i^2t value	69 500 A^2s	
	Maintenance bypass	Option; external	
	Required external bypass protective fuse, recommended rating	3 x 315 A	3 x 400 A

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 48 A, configurable Maximum 66 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

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