

Eaton 93PM 30-50kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	30kW	40kW	50kW
	Model catalogue reference	93PM-30(50)-BB	93PM-40(50)-BB	93PM-50(50)-BB
	Number of internal batteries	0 to 6 x 36 blocks		
	UPS options	Long life batteries (LL) Internal maintenance bypass switch (MBS) External maintenance bypass switch External battery cabinets		
	Upgradability	Yes, up to 50 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)	560 x 914 x 1876 mm		
	Weight, UPS and internal batteries			
	UPS + 0 BAT	288 kg		
	UPS + 3 BAT	579 kg		
	UPS + 4 BAT	676 kg		
	UPS + 5 BAT	773 kg		
	UPS + 6 BAT	870 kg		
	Small External Battery Cabinet dimensions (width x depth x height)	575 x 914 x 1876 mm		
	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 as standard. Top cable entry with optional kit		
	UPS Degree of protection	IP 21		
	UPS colour	Black; RAL 9005		

ENVIRONMENTAL

6.5.5	Acoustic noise at 1 m, in 25 °C ambient temperature	< 60 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 Internal battery	+ 5 °C to + 40 °C* *No output power derating required. + 20 °C to + 25 °C recommended for optimized battery life time		

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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		

EFFICIENCY

5.3.2 r and 6.4.1.6	Efficiency in double-conversion, rated linear load	100% load	96,6%	96,5%	96,3%
		75% load	96,6%	96,6%	96,6%
		50% load	96,1%	96,5%	96,6%
		25% load	94,0%	95,1%	95,7%
	Heat dissipation in double conversion	100% load	1020 W	1400 W	1850 W
		75% load	765 W	1020 W	1275 W
		50% load	585 W	700 W	850 W
		25% load	450 W	490 W	537 W
	Efficiency in ESS, rated linear load	100% load	99,0%	99,1%	99,2%
		75% load	99,0%	99,0%	99,1%
		50% load	98,5%	98,9%	99,0%
		25% load	97,5%	98,1%	98,3%

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				
		100% load	1.0	1.0	1.0
		75% load	0.99	1.0	1.0
		50% load	0.99	0.99	1.0
		25% load	>0.93	0.98	0.98

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5.2.2 c	Rated input current	48 A r.m.s (380 V) 46 A r.m.s (400 V) 44 A r.m.s (415 V)	64 A r.m.s (380 V) 61 A r.m.s (400 V) 58 A r.m.s (415 V)	80 A r.m.s (380 V) 76 A r.m.s. (400 V) 73 A r.m.s (415 V)
5.2.2 f	Maximum input current	95 A		
5.2.2 h and 5.2.2. i	Input current distortion at rated input current	< 4.5%	< 3%	
5.2.2 e	In-rush current	NA. Input filter components only		
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, for rectifier and bypass lines		

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	< 1%		
	100% non-linear load	< 5%		
5.3.2 q	Voltage unbalance at reference unbalanced load	< 0,1%		
5.3.2 j	Voltage transient (r.m.s) at 100% step load	4%		
	Recovery time to steady state at 100% step load	50ms		
5.3.2 c	Rated output frequency	50 or 60 Hz, configurable		
	Output frequency variation	± 0,1 Hz		
	Slew rate	1 Hz/s		
5.3.2 d and 5.3.2 e	Maximum frequency range for synchronization with bypass	± 4 Hz as default. User settable 0,5 to 5 Hz.		
	Maximum synchronized phase error	< 1° with static balanced load		
	Maximum slew-rate when			

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	synchronizing	1 Hz/s		
5.3.2 k	Rated output power	30 kW / 30 kVA	40 kW / 40 kVA	50 kW / 50 kVA
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	180 A, 400 ms 4 x I _n	180 A, 400 ms 3 x I _n	180 A, 400 ms 2,5 x I _n
6.4.2.10.3 and 6.4.2.10.4	Fault clearing capability	35 A gG fuse		
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	40 mA
		Bypass	40 mA
		Stored Energy	20 mA
	Protective conductor current, at full non-linear load	Online	50 mA
		Bypass	200 mA
		Stored Energy	< 10 mA

ESS MODE CHARACTERISTICS

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

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	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	50 kW		
	Bypass voltage range	220/380 V; 230/400 V; 240/415 V tolerance -15% / +10% of 230V		
	Transfer time break	No break		
	Maintenance bypass	Option; internal or external		
	Bypass thyristor i^2t value, $T_{vj} = 25^{\circ}\text{C}$, 8,3 to 10 ms $T_{vj} = 130^{\circ}\text{C}$, 8,3 to 10 ms	25 000 A ² s 18 000 A ² s		
	Required external bypass protective fuse, recommended rating	3 x 63 A	3 x 80 A	3 x 100 A

BATTERY CHARACTERISTICS

5.4.2.2 d	Battery technology	12 V, VRLA		
5.4.2.2 a	Battery design life	5 or 10 years		
5.4.2.2 b	Battery quantity	36 blocks, 216 cells per battery string		
5.4.2.2 c	Battery voltage	432 V		
5.4.2.2 e	Nominal Ah capacity (C10)	Internal batteries 9 Ah or 7 Ah		
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	Default 12A, configurable Maximum 16,5 A		
	Battery start option	Yes		

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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	Access 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 C2 EMC Category C2

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