

Eaton 93PM 120-150kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	120kW	150kW
	Model catalogue reference	93PM-120(150)	93PM-150(150)
	UPS options	Internal Input Switch (IS) Internal Battery Breaker (BB) Internal maintenance bypass switch (MBS) External maintenance bypass switch External battery cabinets	
	Upgradability	Yes, up to 150 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	438 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 as standard. Top cable entry with optional kit
	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* <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

The technical specification is subject to change without notice.

Page 1 of 6

Author: Sini Syvänen

Updated: 24.01.2014

Document: Eaton 93PM 120-150kW technical specification RevA5



Powering Business Worldwide

Eaton 93PM 120-150kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	120kW	150kW
-----------------------	-------------------------	-------	-------

EFFICIENCY

5.3.2 r and 6.4.1.6	Efficiency in double-conversion, rated linear load	100% load	96,7%	96,5%
		75% load	96,7%	96,7%
		50% load	96,7%	96,7%
		25% load	95,7%	96,1%
	Heat dissipation in double conversion	100% load	4095 W	5440 W
		75% load	3071 W	3839 W
		50% load	2048 W	2559 W
		25% load	1350 W	1690 W
	Efficiency in ESS, rated linear load	100% load	99,2%	99,3%
		75% load	99,2%	99,2%
		50% load	99,0%	99,2%
		25% load	98,4%	98,7%

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	3 phases + neutral	
		Rectifier input	3 phases + neutral
		Bypass input	3 phases + neutral
5.2.2 d	Input power factor, double conversion mode		
		20-100% load	> 0,99
		10-20% load	> 0,95
5.2.2 c	Rated input current	190 A r.m.s (380V)	238 A r.m.s (380V)
		181 A r.m.s (400V)	226 A r.m.s (400V)
		174 A r.m.s (415V)	217 A r.m.s (415V)
5.2.2 f	Maximum input current	300 A	

The technical specification is subject to change without notice.

Page 2 of 6

Author: Sini Syvänen

Updated: 24.01.2014

Document: Eaton 93PM 120-150kW technical specification RevA5



Powering Business Worldwide

Eaton 93PM 120-150kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	120kW	150kW
5.2.2 h and 5.2.2. i	Input current distortion at rated input current	< 3%	
5.2.2 e	Inrush current	≤ 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, 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	< 1,2%	
	100% non-linear load	< 5%	
5.3.2 q	Voltage unbalance at reference unbalanced load	< 0,1%	
	Phase displacement at reference unbalanced load	< 0,3°	
5.3.2 j	Voltage transient (r.m.s) at 100% step load	4%	
	Recovery time to steady state at 100% step load	50 ms	
5.3.2 c	Rated output frequency	50 or 60 Hz, configurable	
	Output frequency variation	± 0,01 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 synchronizing	1 Hz/s	
5.3.2 k	Rated output power	120kW / 120kVA	150kW / 150kVA

The technical specification is subject to change without notice.

Page 3 of 6

Author: Sini Syvänen

Updated: 24.01.2014

Document: Eaton 93PM 120-150kW technical specification RevA5



Powering Business Worldwide

Eaton 93PM 120-150kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	120kW	150kW
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	510 A, 400 ms	510 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	0,5 A
	Bypass Stored Energy	0,6 A

ESS MODE CHARACTERISTICS

Transfer time to double-conversion	No break Typically 2 ms
Mains available	
Mains failure	
Output voltage variation setting	±10% of nominal voltage, default
Output frequency variation setting	± 3 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.

The technical specification is subject to change without notice.

Page 4 of 6

Author: Sini Syvänen

Updated: 24.01.2014

Document: Eaton 93PM 120-150kW technical specification RevA5

Eaton 93PM 120-150kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	120kW	150kW
--------------------------	-------------------------	-------	-------

BYPASS

Type of bypass	Static		
Bypass rating	150 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 fuse i^2t value	69 500 A ² s		
Required external bypass protective fuse, recommended rating	3 x 250 A	3 x 315 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	Default 36 A, configurable Maximum 50 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	

The technical specification is subject to change without notice.

Page 5 of 6

Author: Sini Syvänen

Updated: 24.01.2014

Document: Eaton 93PM 120-150kW technical specification RevA5



Powering Business Worldwide

Eaton 93PM 120-150kW UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	120kW	150kW
--------------------------	-------------------------	-------	-------

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 C3 EMC Category C3

The technical specification is subject to change without notice.

Page 6 of 6

Author: Sini Syvänen

Updated: 24.01.2014

Document: Eaton 93PM 120-150kW technical specification RevA5