

Eaton 93E 15-80kVA UPS Technical Specification

Manufacturer's declaration

IEC 62040-3 Subclause	MODEL RATING (0.9 p.f.)	15kVA	20kVA	30kVA	40kVA	60kVA	80kVA
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	Model catalogue reference	93E15KMBSB 93E15KMBSBI	93E20KMBSB 93E20KMBSBI	93E30KMBSB 93E30KMBSBI	93E40KMBSB 93E40KMBSBI	93E60KMBSN	93E80KMBSN
5.1.1	UPS topology	Double conversion, IGBT converters					
	Upgradeability	Up to 20 kVA	-	-	-	-	-

MECHANICAL

	UPS dimensions (width x depth x height) mm ³	500 x 710 x 960		500 x 710 x 1230	500 x 710 x 1500	600 x 800 x 1880	
	Weight (kg) without batteries	72	72	91	120	202	245
	Weight with internal batteries (kg)	272	272	376	490	-	-
	UPS Cable entry	Bottom / rear					
	UPS Degree of protection	IP20 (EN60529), with front door mounted washable dust filter					
	UPS colour	Black, RAL 9005					

ENVIRONMENTAL

6.5.5	Acoustic noise at 1 m (ISO7779) @ 75% Load	≤ 55 dBA		≤ 62 dBA		≤ 65 dBA	
4.1.4	Ambient UPS storage temperature range	- 15 °C to + 55 °C in the protective package					
4.2.1.1 and 5.4.2.2 h	Ambient operating temperature range UPS Battery	+0 to +40 °C +5 to 25 °C without reducing battery life					
4.2.1.1	Relative humidity range	5 to 95%, no condensation allowed					
4.2.1.2	Operating altitude	1000 m above sea level Maximum 2000 m with 1% de-rating per each additional 100m above 1000m					

EFFICIENCY

5.3.2 r and 6.4.1.6	Efficiency in double-conversion, rated linear load						
	100% load	93,6 %	93,3 %	93,8 %	93,3 %	93,8 %	93,8 %
	75% load	93,5 %	93,6 %	94,0 %	93,6 %	94,0 %	94,0 %
	50% load	92,8 %	93,4 %	94,0 %	93,4 %	94,0 %	94,0 %
	25% load	89,8 %	91,2 %	92,5 %	91,2 %	92,5 %	92,5 %
	Heat dissipation in double conversion						
	100% load	920 W	1230 W	1775 W	2460 W	3555 W	4735 W
	75% load	706 W	980 W	1315 W	1955 W	2625 W	3505 W
	50% load	520 W	660 W	810 W	1320 W	1625 W	2165 W
	25% load	380 W	430 W	520 W	855 W	1045 W	1390 W

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	Efficiency in HE, rated linear load	
	100% load	98,0 %
	50% load	97,5 %

ELECTRICAL CHARACTERISTICS

INPUT

5.2.1.a and 5.2.1 b	Rated input voltage	3 x 230/400 Vac nominal (220/380, 240/415 Selectable)					
	Voltage tolerance Rectifier input	190/330 – 276/478 V (-15%, +20%) at 100% load, 116/201 – 276/478 V (-50%, +20%) at 50% load					
	Bypass input	207/359 – 253/438 V ($\pm 10\%$ of nominal, selectable up to $\pm 20\%$)					
5.2.1 c and 5.2.1 d	Rated input frequency	50 or 60 Hz					
	Frequency tolerance	42 to 70 Hz					
5.2.2 a and 5.2.2 b	Number of input phases	3 phases + neutral					
5.2.2 d	Input power factor	0,99pf at 100% load					
5.2.2 c	Rated rectifier input current, A	23	31	46	61	92	122
5.2.2 f	Maximum rectifier input current, A	25	33	49	65	98	131
	Bypass input current, recommended/maximum, A	22/25	29/33	43/50	58/66	87/100	115/133
5.2.2 h and 5.2.2 i	Input current distortion at rated input current	< 5% THDi (linear load)					
5.2.2 e	In-rush current	<100% of rated current					
5.2.2 k	AC power distribution system compatibility	TN, TN-S, TN-C, TN-C-S, TT (three-phase, four-wire + PE)					
	Rectifier ramp-up, rectifier start and load step	Yes					

ELECTRICAL CHARACTERISTICS

OUTPUT

5.3.2 f and 5.3.2 g	Number of output phases	3 phase + neutral					
	Crest factor	2,7					
5.3.2 b	Rated output voltage	230/400 Vac, three phase (220/380, 240/415 selectable)					
5.3.2 b	Output voltage variation	$\pm 1\%$ Balanced static load, $\pm 6\%$ with 400ms recovery from 100% load step, $\pm 5\%$ Balanced dynamic load (EN62040-3)					
	Rated peak output voltage	325 V, ± 20 V					
5.3.2 i	Total voltage harmonic distortion	100% linear load	< 2%				
		100% non-linear load	< 7%				
5.3.2 q	Voltage unbalance at reference unbalanced load	< 2%					
	Phase displacement at reference unbalanced load	<2.5 deg.					
5.3.2 j	Voltage transient (r.m.s)	0% during transfer from stored energy to normal mode					
	Recovery time to steady state	$\pm 6\%$ with 400 ms recovery from 100% load step					
5.3.2 c	Rated output frequency	50 (default) or 60 Hz					
	Output frequency variation	± 4 Hz (default) selectable from ± 1 Hz to ± 4 Hz					

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	Slew rate	0,5 Hz/s (default), 2,5 Hz/s, or 7,5 Hz/s selectable					
5.3.2 d and 5.3.2 e	Maximum frequency range for synchronization with bypass Maximum slew-rate when synchronizing	±3 Hz as default, up to ±7 Hz user settable up to 0,5 Hz/s					
5.3.2 k	Rated output power	15kVA / 13,5kW	20kVA / 18kW	30kVA / 27kW	40kVA / 36kW	60kVA / 54kW	80kVA / 72kW
5.3.2 l	Overload capability On inverter @ 30 °C	60 min 102-110% load 10 min 111-125% load 60 s 126-150% load 500 ms >151% load					
	Overload capability On inverter, stored energy mode @ 30 °C	1 min 102-125% load 30 s 126-150% load 500 ms >151% load					
	Overload capability On bypass @ 40 °C and ≤1000m altitude	Continuous < 115% load 20 ms 1000% load Selected external Bypass fuses or breakers may limit the overload capability					
	Output current limitation, short-circuit capability	2 x In, 0...100ms, then 1,5 x In, 100...160ms					
6.4.2.10.3 and 6.4.2.10.4	Fault clearing capability	Through upstream breaker or fusing for BYPASS Through fusing and breaker for Rectifier					
5.3.2 o and 5.3.2 p	Load power factor range	From 0,7 lagging to 0,9 leading without de-rating					

HE MODE CHARACTERISTICS

	Transfer time to double-conversion Mains available Mains failure	No break < 4 ms in normal transfer conditions, < 10 ms maximum
	Acceptable output voltage variation	±10% of nominal voltage
	Acceptable output frequency variation	±4 Hz

BYPASS

	Automatic bypass	Static Bypass, continuously rated, no break transfer		
	Bypass rating	30 kVA	40 kVA	80 kVA
	Bypass voltage range	3 x 230/400 Vac nominal (220/380, 240/415 Selectable)		
	Transfer time break	no break		
	Backfeed protection	Standard		
	Maintenance bypass (internal)	Standard		
	Rated conditional short-circuit current, Static bypass <i>ICC</i>	6kA* *using external gG protective fuse		10kA* *using external gG protective fuse
	Bypass thyristor i^2t value, $T_{vj} = 25^{\circ}\text{C}$, 8,3 to 10 ms	10 200 A ² s		20 400 A ² s
				125 000 A ² s

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Required external bypass protective fuse, recommended rating	32 A	35 A	63 A	80 A	125 A	160 A
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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	192 to 240 cells per string (192 cells for internal batteries)					
5.4.2.2 c	Battery voltage	384 V (192 Cells) to 480 V (240 Cells)					
5.4.2.2 f	Recharge time to 90 % capacity	Maximum 10 hours recommended (dependent on battery size)					
5.4.2.2 o	Recharge profile	Advanced Battery Management (ABM [®]) = 90% resting, 10% floating/charging (typical)					
5.4.2.2 q	End of discharge voltage	With <10% load, 1.75 V/cell. With >10% load, 1.67 V/cell					
5.4.2.2 r	Charging current (at full load)	5.3 A	5.3 A	8 A	10.6 A	16 A	24 A

COMMUNICATION CIRCUITS

5.6	Display	Graphical LCD with blue backlight, 4x LEDs for notice and alarm					
	Standard connectivity ports	2x Mini-Slot , 1x Emergency Power Off input (NC or NO), 3x Signal inputs, 1x RS232, 1x USB (exclusively for service tool use)					
	Optional	Mini-Slot cards; Web/SNMP, Industrial relay, ModBus card					
	Complete list of indications and interface devices	See User's Manual					

COMPLIANCE WITH STANDARDS

IEC 62040-1	Safety Access	Restricted access					
	Degree of protection	IP 20;					
		protection against medium sized foreign matter (incl. finger)					
IEC 62040-2	Electromagnetic Compatibility						
	Immunity	IEC/EN 62040-2					
	Emissions	IEC/EN 62040-2					