

# Eaton 93T 15-80 kVA UPS Technical Specification

## (Integrated model)

CONSTRUCTION	15 kVA	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA
kVA/kW Rating (all modes)	15/15	20/20	30/30	40/40	60/60	80/80
UPS Topology	Double Conversion, IGBT Converters					
Classification	VFI-SS-111					
UPS Dimensions: W x H x D (mm) with internal battery	380*1328*740			380*1575*740	500*1750*820	
UPS Dimensions: W x H x D (mm) Without internal battery	380*1328*740			380*1575*740	500*1750*820	
UPS Dimensions: W x H x D (mm) Without battery compartment	380*650*740				500*675*820	
Degree of protection	IP20					
Cable Entry	Rear					
Conformal coating	PCBA conformal coating					
Colour	Pantone Black C					
Weight (kg) with battery compartment but without batteries	147	149	152	159	260	268
Weight (kg) with batteries	237	288	332	399	660	768
Weight (kg) without battery compartment	79	79	81	81	128	128

### ENVIRONMENT

Ambient storage temperature	Range of -25 to +70 °C in the protective package					
Ambient service temperature	Power electronics: 0 to +40 °C (0-50 °C with derating) Battery part: +5 to +25 °C without reducing battery life					
Maximum service altitude	1500 m at 40 °C without de-rating Maximum 2000 m with 1 % de-rating per each additional 100 m above 1500 m					
Relative humidity	5 to 95 %, non-condensing					
Audible noise at 1 m @ 75 % Load (ISO7779)	≤55dB		≤63dB		≤68dB	
Electromagnetic Compatibility	Immunity and emission to IEC/EN 62040-2					

### USER INTERFACE & COMMUNICATIONS

Display	5" Touchscreen HMI, 4x LEDs for notice and alarm					
Standard Communication Ports	2x Mini-Slot, 1x Emergency Power Off input (NC or NO), 3x Building Alarm inputs, 1x RS232					
Optional Communication Cards	Mini-slots cards: Gigabit Network-M2/M3, Industrial Gateway-M2, EMP DT1H1C2					

### ELECTRICAL CHARACTERISTICS – INPUT

AC Power Distribution System compatibility	TN, TN-S, TN-C, TN-CS, TT (Three-phase,4-wire+PE)					
Rated input voltage and voltage tolerance	<u>Rectifier:</u> 230/400 Vac nominal (220/380 Vac, 240/415 Vac Selectable) Tolerance: 190/330-276/478V (-15 %, +20 %) at 100 % load, 116/201-276/478V (-50 %, +20 %) at 50 % load <u>Bypass:</u> 230/400Vac nominal (220/380 Vac, 240/415 Vac Selectable) Tolerance: 195/338-264/458 V (±15 % of nominal, selectable up to ±20 %)					
Operating Frequency / Tolerance	50 or 60 Hz; Tolerance 40-72 Hz					
Input current distortion	<3 % THDi (Linear load condition at rated input current)					
Input power factor	0.99PF at 100 % load					
Inrush Current	< 5x nominal					
Number of input phases	3 phases + Neutral + PE (3 phase)					
Rated Rectifier Input Current (r.m.s. @ 400 V)	23 A	31 A	45 A	61 A	91 A	122 A
Max Rectifier Input Current (r.m.s. @ 400 V)	27 A	36 A	54 A	72 A	108 A	144 A

Bypass Input Current (r.m.s. @ 400 V) Recommended/Maximum(115 % Load)	22A/26A	30A/34A	44A/51A	59A/68A	89A/ 102A	118A/ 136A
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### ELECTRICAL OUTPUT CHARACTERISTICS – DOUBLE CONVERSION

	15 kVA	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA
Rated output voltage	230/400 Vac, three phase, (220/380 Vac, 240/415 Vac selectable)					
Output voltage variation	±1 % Balanced load, ±2 % Unbalanced load 0 % during transfer from stored energy to normal mode, ±5 % with 10ms recovery from 10 % to 90 % load step					
Crest factor	3:1					
Rated output frequency	50 Hz (default) or 60 Hz					
Output frequency variation when synchronised	±0.1Hz					
Output frequency synchronised phase error at change of mode	Maximum of 2.5 °					
Total voltage distortion	<2 % with linear load, <5 % with non-linear load defined according to EN62040-3					
Short circuit capability (200 ms)	73 A	73 A	108 A	145 A	217 A	290 A
Overload capacity without bypass	102-110 % load 60 min, 111-125 % load 10min, 126-150 % load 1min, >150% load 150 ms at 40 °C					
Load power factor range	0.5 lagging to 0.7 leading without de-rating					

### ELECTRICAL OUTPUT CHARACTERISTICS – STORED ENERGY

Transfer to/from stored energy	No break					
Rated output voltage	230/400 Vac, three phase, (220/380 Vac, 240/415 Vac selectable)					
Number of output phases	3 phases					
Output voltage variation	±1 % Balanced load, ±2 % Unbalanced load 0 % during transfer from stored energy to normal mode, ±5 % with 10 ms recovery from 10 % to 90 % load step					
Crest factor	3:1					
Rated output frequency	50 Hz (default) or 60 Hz					
Output frequency variation	±0.1 Hz					
Total output voltage distortion	<2 % with linear load, 5 % with non-linear load defined according to EN62040-3					
Short circuit capability (200 ms)	73 A	73 A	108 A	145 A	217 A	290 A
Overload capability	102-110 % load 10 minute, 111-125 % load 30 seconds, 126-150 % load 10 seconds, >151% load 150 ms at 40 °C					
Load power factor range	0.5 lagging to 0.7 leading without de-rating					

### EFFICIENCY (Input/Output)

Linear Load Efficiency, Double Conversion Mode @ 400 V/50Hz	25 % load:						
	50 % load:	95.03 %	95.58 %	95.13 %	95.59 %	95.54 %	95.82 %
	75 % load:	95.18 %	96.11 %	95.89 %	96.01 %	96.17 %	96.25 %
	100 % load:	95.56 %	96.00 %	96.03 %	95.92 %	96.11 %	95.98 %
		95.88 %	95.64 %	95.92 %	95.59 %	96.03 %	95.78 %
Heat Dissipation Double Conversion Mode @ 400 V/50Hz	25 % load:						
	50 % load:	693.9 W	924.87 W	1535.79 W	1845.38 W	2800.92 W	3489.88 W
	75 % load:	599.0 W	809.48 W	1285.84 W	1662.33 W	2389.52 W	3116.88 W
	100 % load:	616.7 W	833.33 W	1240.24 W	1701.42 W	2428.47 W	3350.69 W
		674.7 W	911.75 W	1276.06 W	1845.38 W	2480.48 W	3524.74 W
Linear Load Efficiency, ESS Mode	50 % load:	98.82 %	98.86 %	98.83 %	98.88 %	98.86 %	98.88 %
	100 % load:	99.08 %	99.08 %	99.14 %	99.08 %	99.18 %	99.06 %

**BYPASS CHARACTERISTICS**

Automatic bypass	Static bypass switch continuously rated*, uninterruptible transfer. *Bypass capable of 115 % continuous load					
Automatic bypass nominal rating	15 kVA/15 kW	20 kVA/20 kW	30 kVA/30 kW	40 kVA/40 kW	60 kVA/60 kW	80 kVA/80 kW
Automatic bypass thyristor i <sup>2</sup> t value	7200 A <sup>2</sup> s	7200 A <sup>2</sup> s	16200 A <sup>2</sup> s	16200A <sup>2</sup> s	16200*2 A <sup>2</sup> s	16200*2 A <sup>2</sup> s
Separate bypass input feed	Standard (single feed cable links supplied for field fitting)					
Bypass frequency range	±4 Hz (default), selectable from ±1 Hz to ±4 Hz					

**BATTERY**

Battery Nominal Voltage	320V-607 V					
Battery cut-off voltage	VRLA: 1.67 V/Cell					
Restored energy time to 90 %	Maximum 10 hours recommended (dependant on battery size)					
Charging Current	15 A	20 A	30 A	40 A	60 A	80 A
Backup time, full load (min)	6	6	6.2	5.1	7.4	5.8
Battery recharge profile	Advanced Battery Management (ABM®) = 90 % resting, 10 % floating/charging (typical)					