

# Eaton 9SX 5-11kVA UPS Technical Specification

<b>CONSTRUCTION</b>				
<b>Model</b>	<b>9SX5Ki</b>	<b>9SX6Ki</b>	<b>9SX8Ki</b>	<b>9SX11Ki</b>
Rating	5kVA/4.5kW	6kVA/5.4kW	8kVA/7.2kW	11kVA/10kW
Power Factor	0.9			0.91
Technology	VFI-SS-111, on-line double conversion with power factor correction			
Dimensions: W x D x H (mm) Rack Configuration:	440 x 685 x 130 (3U)		Power Module: 440 x 700 x 130 (3U) Battery Module: 440 x 680 x 130 (3U)	
Dimensions: W x D x H (mm) Tower Configuration:	130 x 685 x 440		260 x 700 x 440 (combined)	
Weight (kg)	48kg		Total: 84kg (Power Mod: 19kg) (Battery: 65kg)	Total: 86kg (Power Mod: 21kg) (Battery: 65kg)
Colour	Black, RAL 9005			
<b>ENVIRONMENTAL &amp; SAFETY</b>				
Ambient storage temperature	0°C to +35°C with batteries and -15°C to +60°C without batteries			
Ambient service temperature	Power electronics part: 0 to +40°C Battery part: +5 to +25°C without reducing battery life			
Maximum service altitude	1000m above sea level, 10% de-rating for every 1000m to 3000m maximum			
Relative humidity	0 to 95%, no condensation allowed			
Degree of protection	IP20 (EN60529)			
Acoustic Noise @ 1m	≤45dB 5/6kVA, ≤48dB 8kVA, ≤50dB 11kVA Online mode at nominal conditions, battery fully charged			
Safety Conformance	IEC 62040-1:2008, IEC 60950-1:2005, UL 1778 4th (5 & 6kVA UPS, 8 & 11kVA Power modules)			
Electromagnetic Compatibility	IEC 62040-2:2006 Categories C2, CISPR22 Class A, FCC part 15 Class A (5 & 6kVA UPS, 8 & 11kVA Power modules)			
Agency Markings	CE, C-Tick, UL (5 & 6kVA UPS, 8 & 11kVA Power modules)			
<b>POWER CONNECTIONS</b>				
Input	5/6kVA: Terminals (up to 10mm <sup>2</sup> ), 8/11kVA: Terminals (up to 16mm <sup>2</sup> )			
Output	5/6kVA (without MBP): Terminals (up to 10mm <sup>2</sup> ), +(2) IEC16A, +(4) IEC10A programmable Group 1, +(4) IEC10A programmable Group 2 5/6kVA (with MBP): Terminals (up to 10mm <sup>2</sup> ), +(2) IEC16A, +(3) IEC10A 8/11kVA (without MBP): Terminals (up to 16mm <sup>2</sup> ) 8/11kVA (with MBP): Terminals (up to 16mm <sup>2</sup> ) +(4) IEC16A			
<b>USER INTERFACE</b>				
Display	Graphical Blue LCD with LED backlight, 4x LEDs for notice and alarm			
Standard Communication Ports	(1)USB 2.0, (1)RS232;DB9, (1)Relay Port;DB9, (1)Remote Power Off Port, (1)Remote On/Off Port, (1)Minislot Port (Empty)			
Relay Port Voltage Free Contacts	On Mains, On Automatic Bypass, On Battery, Battery Low, Load Protected			
Output Relay Specifications	250V AC, 5A			
Optional	Minislot cards; Web/SNMP, Relay, ModBus			
<b>ELECTRICAL CHARACTERISTICS – INPUT</b>				
Number of input phases	1 Phase (Separate Rectifier and Bypass inputs available on 8-11kVA)			
Rated input voltage and voltage tolerance	<u>Rectifier:</u> 230Vac nominal (200, 208, 220, 240, 250V* Selectable**) Tolerance: 176-276V (-23% to +20%) at 100% load, 150-276V (-35% to +20%) at 80% load, 125-276V (-45% to +20%) at 60% load, 100-276V (-56% to +20%) at 40% load <u>Bypass:</u> 187-264V*** at nominal 230V (-20%, +15% of nominal) *250V available only on 8/11kVA **De-rate for 11kVA. 200/208/250V: -10% kVA/kW, 220V: -1% kW ***Can be set to 160-264V, or up to 100-264V if unsynchronised bypass transfer function is enabled			

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### ELECTRICAL CHARACTERISTICS – INPUT (continued)

Model	9SX5Ki	9SX6Ki	9SX8Ki	9SX11Ki
Operating Frequency / Tolerance	50/60Hz Auto-sensing Tolerance 50Hz nominal: 40-60Hz before transfer to battery Tolerance 60Hz nominal : 50-70Hz before transfer to battery			
Input current distortion	<5% THDi (nominal input voltage, full load and battery fully charged)			
Input power factor	≥0.99pf			
Inrush Current	≤800% of rated RMS current			
UPS Nominal Input Current @ 230V with batteries fully charged	21A	25.2A	33.1A	45.8A
Recommended protection circuit rating (D Curve)	32A		50A	80A

### ELECTRICAL OUTPUT CHARACTERISTICS – NORMAL MODE

Rated apparent/active power	5kVA/4.5kW	6kVA/5.4kW	8kVA/7.2kW	11kVA/10kW
Number of output phases	1 Phase			
Load power factor range	0.5 lagging to 0.5 leading			
Rated output voltage	230Vac nominal (200, 208, 220, 240, 250V* Selectable**) *250V available only on 8/11kVA **De-rate for 11kVA: 200/208/250V -10% kVA/kW, 220V -1% kW			
Steady state voltage variation	±1%			
Dynamic voltage regulation & recovery time	±6% for 20%→100%→20% Resistive Load ±9% for 0%→100%→0% Resistive Load Recovery time 100ms to 90% Vnom after 0%→100%→0% non-linear load (IEC62040-3 reference) step			
Crest factor	3:1			
Rated output frequency	50Hz (default) or 60Hz			
Output frequency regulation	When synchronised: ±5% default, selectable ±1% to ±10% Unsynchronised (or on battery mode or frequency converter mode) ±0.5%			
Frequency Slew Rate	1Hz/s (0.5 Hz/s in Hot Standby configuration)			
Total output voltage distortion	<2% linear load; <5% non-linear load (IEC62040-3 reference)			
Overload capability	100-102%: No alarm 102-110%: Load transfers to bypass after 2 minutes 110-125%: Load transfers to bypass after 1 minute 125-150%: Load transfers to bypass after 10 seconds >150%: Load transfers to bypass after 500ms Maximum current: 90A for 5/6kVA models, 120A for 8kVA, 150A for 11kVA			
Overload capability (bypass mode)	100-125%: No alarm 125-150%: UPS shuts down after 1 minute >150%: UPS shuts down after 1 second			

### ELECTRICAL OUTPUT CHARACTERISTICS – STORED ENERGY

Rated apparent/active power	5kVA/4.5kW	6kVA/5.4kW	8kVA/7.2kW	11kVA/10kW
Waveform	Sine Wave			
Transfer–normal to stored energy	No break			
Load power factor range	0.5 lagging to 0.5 leading			
Rated output voltage	230Vac nominal (200, 208, 220, 240, 250V* Selectable**) *250V available only on 8/11kVA **De-rate for 11kVA: 200/208/250V -10%, 220V -1% kW			
Steady state voltage variation	±1%			
Dynamic voltage regulation & recovery time	±6% for 20%→100%→20% Resistive Load ±9% for 0%→100%→0% Resistive Load Recovery time 100ms to 90% Vnom after 0%→100%→0% non-linear load (IEC62040-3 reference) step			

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### ELECTRICAL OUTPUT CHARACTERISTICS – STORED ENERGY (continued)

Model	9SX5Ki	9SX6Ki	9SX8Ki	9SX11Ki
Crest factor	3:1			
Rated output frequency	50Hz (default) or 60Hz			
Output frequency regulation	±0.5%			
Total output voltage distortion	<2% linear load; <5% non-linear load (IEC62040-3 reference)			
Efficiency	>91%			
Overload capability	102-130% 10s, >130% 100ms			

### EFFICIENCY (Input/Output)

Efficiency at 100% load (On Line Mode/High Efficiency Mode)	>93.5% / 98%	>94.5% / >98%	>95% / 98%
Battery Management	Advanced Battery Management (ABM <sup>®</sup> ) = 90% resting, 10% floating/charging. Automatic battery testing, deep discharge protection, automatic recognition of battery modules, float temperature compensation - 3mV per °C (25°C nominal)		
Battery Nominal Voltage	5/6kVA: 180V (90 Cells), 8/11kVA: 240V (120 cells)		
Charging Current	5/6kVA: 1A ±20%, 8/11kVA: 1.7A ±20% (Additional 12A for 8/11kVA available with Supercharger option)		
UPS Standard Battery Configuration	5/6kVA: 15 x 12V 5 Ah internal batteries, VRLA, AGM 8/11kVA battery module (EBM): 20 x 12V 7 Ah batteries, VRLA, AGM		
EBM Configuration	5/6kVA: 2 strings of 15 x 12V 5 Ah batteries 8/11kVA: 1 string of 20 x 12V 7 Ah batteries		
Battery Replacement	Hot-swappable internal and external batteries		

Battery Run Times 9SX5Ki*	Internal	+ 1 EBM	+ 2 EBMs	+ 3 EBMs	+ 4 EBMs
Minutes @ 100% load, 0.9pf	3.5	20	38	54	80
Recharge time to 90% capacity	1.5h	7.1h	13.7h	19.4h	27.4h
Battery Run Times 9SX6Ki*	Internal	+ 1 EBM	+ 2 EBMs	+ 3 EBMs	+ 4 EBMs
Minutes @ 100% load, 0.9pf	3	16	28	47	58
Recharge time to 90% capacity	1.5h	7.1h	13.7h	19.4h	27.4h

Note: 4 EBMs recommended for 5/6kVA, maximum 12 EBMs possible

Battery Run Times 9SX8Ki*	Std EBM	+1 EBM	+2 EBMs	+3 EBMs	+4 EBMs	+5 EBMs
Minutes @ 100% load, 0.9pf	3.5	12	21	29	42	51
Recharge time to 90% capacity	1.2h	3.8h	5.8h	8.4h	13h	14h
Battery Run Times 9SX11Ki*	Std EBM	+1 EBM	+2 EBMs	+3 EBMs	+4 EBMs	+5 EBMs
Minutes @ 100% load, 0.9pf	2	6	10	18	24	33
Recharge time to 90% capacity	0.7h	2.3h	4.1h	6.5h	10.4h	13.9h

Note: 6 EBMs recommended for 8/11kVA, maximum 12 EBMs (or 400Ah) possible with additional charger (Supercharger option)  
Contact Eaton for run times with 7-12 EBMs or large external batteries.

\*Battery times are approximate and vary depending on age, temperature, load configuration and battery charge.

### BYPASS CHARACTERISTICS

Type of bypass	Automatic Static Bypass Common Mains & Bypass input for 5/6kVA Separable Mains & Bypass input for 8/11kVA
Transfer	0ms (10ms or 20ms unsynchronised transfer to bypass can be selected) <10ms transfer time when exiting from High Efficiency mode
Maintenance Bypass	Optional Maintenance Bypass Panel (MBP) fitted to rear, side or top of UPS, or mounted separately. Provides make before break transfer, enabling isolation, removal & replacement of UPS/Power module without disruption