



Technical Data Sheet - 500 kVA UL Listed

**SG Series Uninterruptable Power Supply**  
**500 kVA UL listed with eBoost™**



**General Data**

Topology		True On-line double conversion			
Nominal output power at PF = 0.9 lag.		500kVA (450 kW)			
System Efficiency in Double Conversion operating mode @0.9 pf lagging load, nominal voltage/frequency, energy storage disconnected		25% load	50% load	75% load	100% load
with 5th filter		90.5%	93.6%	94.0%	93.9%
with 5th filter and 11th filter		90.5%	93.2%	93.9%	93.8%
System Efficiency in eBoost Operating mode @0.9 pf lagging load, nominal voltage/frequency, energy storage disconnected		25% load	50% load	75% load	100% load
		97.5%	98.5%	98.8%	98.9%
Heat rejection in Double Conversion operating mode @0.9 pf lagging load, nominal voltage/frequency, energy storage disconnected		25% load	50% load	75% load	100% load
with 5th filter		40295	52494	73506	99748
		11.8	15.4	21.5	29.2
with 5th filter + 11th filter		40295	56015	74811	101491
		11.8	16.4	21.9	29.7
Heat rejection in eBoost Operating mode @0.9 pf lagging load, nominal voltage/frequency, energy storage disconnected		25% load	50% load	75% load	100% load
		9843	11691	13987	17078
		2.9	3.4	4.1	5.0
Max Cooling Air (77°F - 86°F / 25°C - 30°C)		5099 CFM			
Audible noise level (at 5 ft.)					
Double Conversion Mode		65 dB(A)			
eBoost Mode		60 dB(A)			
Operating temperature range					
UPS		32°F - 104°F (0°C - 40°C)			
Battery		68°F - 77°F (20°C - 25°C)			
		(Note: Higher temperatures shorten battery life)			
Storage temperature range					
UPS		5°F - 122°F (-15°C to +50°C)			
Battery		32°F - 104°F (0°C - 40°C)			
(VRLA)		Storage time is 6 months at 77°F (25°C). (consult factory for higher times)			
		(Note: Higher temperatures reduce battery storage time)			
Relative humidity		0-95%, non-condensing			
Maximum altitude		3281 /1000 (no derating)			
		4921ft (1500Mts)	6562ft (2000Mts)	8202ft (2500Mts)	9843ft (2500Mts)
		-5%	-9%	-14%	-18%
		Derating			




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Enclosure			
	Type :	Indoor (IP20) and NEMA PE 1	
	Safety :	Internal dead front construction	
	Cooling :	Forced Air (Redundant Fans)	
	Color :	Black (RAL 9005)	
Installation			
	Rigging :	Suitable for handling by forklift	
	Mounting :	Floor mounting holes provided	
	Installation and maintenance access :	Front access required for normal maintenance	
	Conduit Entry :	Top and Bottom standard	
Standards			
		UL 1778, IEC 62040, ISO9001	
	Electrostatic discharge immunity	4kV contact / 8kV air discharge	
Configuration			
	Standard :	Stand-alone	
	Optional :	RPA - up to 6 units may be paralleled in any combination for redundancy or capacity	
Fault current rating			
		UPS is designed for installation in an electrical system upto 65kA	
<b>NOTE 1:</b> The Bypass input must be fed from a grounded-WYE electrical system. refer factory for 3-wire operation on bypass input. The load cannot use neutral unless the bypass input feeder includes neutral.			
Rectifier			
Configuration			
		Six Pulse Thyristor, three phase bridge	
Input			
	Voltage :	480VAC, 3-phase, 3 wire + ground (NOTE 1)	
		(-20% to +15% without battery discharge)	
	Frequency :	60Hz, +/-10% (54-66Hz)	
	Filter Configuration:	w/ 5th filter	w/ 5th & 11th filters
	Harmonic Current Distortion:	< 7% THD	< 5% THD
	Power Factor (Typical):	0.93 lagging	0.97 lagging
	Inrush current :	Limited by soft-start circuit	
	Power walk-in :	30 seconds (Adjustable)	
	Output Voltage Tolerance :	+/- 1%	
	DC ripple voltage :	+/- 1%	
	DC ripple current :	Max. 5% of battery capacity expressed in amps	
UPS configurations Vs. current limits		5th filter	5th + 11th
Nominal input (100% load)	Current[A] :	617.0	594.0
(0.9 PF load, fully chrg'd bat.)	kVA :	513.0	494.0
	kW :	482.0	482.0
Maximum input (100% load)	Current[A] :	708.0	682.0
(0.9 PF load, max. chrg current)	kVA :	588.0	567.0
	kW :	553.0	555.0
Max. charge current	A	130	130
Battery			
Battery compatibility			
		Lead-acid or NiCd, VRLA or flooded	
Number of cells			
		240 (lead-acid)	
Float voltage at 68°F (20°C)			
		540VDC	
Minimum discharge voltage			
		396VDC (adjustable)	
Recharge time for 30 minute battery			
		10 times the discharge time	
Battery ground fault detection			
		Standard	
Automatic and manual battery test			
		Standard	
100% load, 0.9 PF lag.	kWB :	475.0	
Maximum Discharge Current at 480V	A:	1196	



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Inverter		
Nominal output voltage	480VAC, 3-phase, 4 wire + ground (NOTE 1)	
Inverter bridge	IGBT technology and Space Vector Modulation	
Output Isolation transformer	Standard	
Output waveform	True sine wave	
Output voltage tolerance		
Static:	+/- 1%	
Load step 0% - 100% - 0% :	+/- 3%, recovering to within +/- 1% in 1 cycle	
Load step 0% - 50% - 0% :	+/-2%, recovering to within +/- 1% in 1 cycle	
100% unbalanced load (Ph-N) :	+/- 3%	
Output voltage distortion		
100% linear load :	2% THD maximum	
100% non-linear load (per IEC 62040) :	3% THD maximum	
Crest factor capability	≤3:1	
Output neutral rating	200%	
Phase displacement		
100% balanced load :	120° +/- 1%	
100% unbalanced load :	120° +/- 2%	
Output frequency		
Free running :	60Hz, +/- 0.01%	
Synchronized with utility :	+/- 4% (adjustable from 57.6Hz to 62.4Hz)	
Overload capability (on inverter)	125% at 0.9 PF for 10 minutes. 150% at 0.9 PF for 30 seconds	
Short circuit capability (on inverter)	700% of rated current for first 1.2 ms, followed by 220% for 100 ms, electronically limited	
Maximum Output Current @ 0.9pf	601 A	
Static Bypass		
Input configuration	Common with rectifier (default) or dual input	
Input wiring configuration	same as Load side	
Configuration	Full load continuous rated static switch Backfeed protection Backfeed protection + Semiconductor fuse for clearing fault currents	
Transfer limits	+/- 10% of nominal output voltage (adjustable)	
Overload capability (on bypass)	110% continuous 200% for 5 minutes	
Short circuit capability (on bypass)	1000% for 1/2 cycle (non-repetitive)	
eBoost™ Operating Mode		
Input wiring configuration	480VAC, 3-phase, 4 wire + ground (NOTE 1)	
Output waveform	Continuously monitored	
Transfer time (static bypass to Inverter)	<4ms (typical)	
Transfer limits		
Steady-state RMS tolerance	+/-20 Vrms (adjustable)	
Instantaneous voltage distortion (with respect to Normal Sine wave)	Magnitude	+/-75Vp
	Duration	500µs (adjustable)
Steady-state frequency tolerance	+/-3 Hz	
Instantaneous phase shift	0.15 radians (8.5 Deg)	

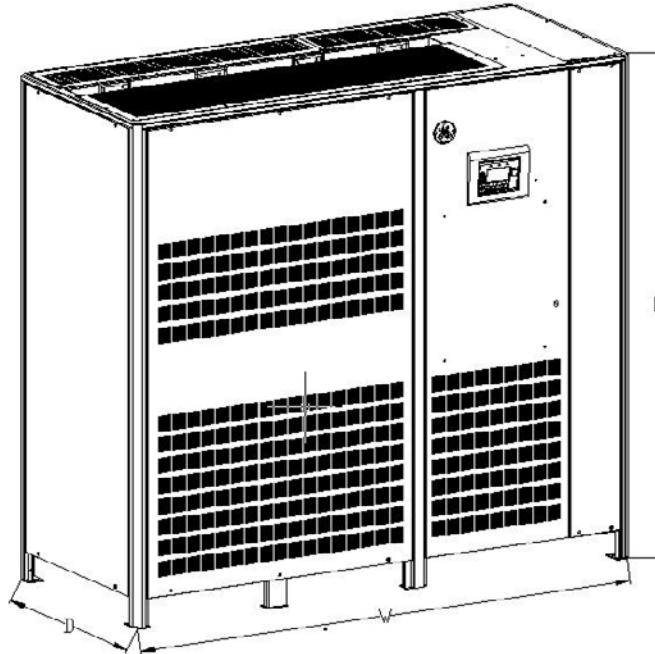


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<b>External Interface</b>	
Alarm contacts (voltage-free)	
Standard :	6 user defined contacts (form 'C') (1A / 24V DC)
Optional :	12 user defined contacts (form 'C') (1A / 24V DC)
	(23 selectable signals include aux. Inputs 1 & 2)
Communication - Optional	RS-232 / SNMP / MODBUS
Input signals	Emergency Power Off (user supplied N.C. contact)
	Aux. input 1 * (default = On Generator)
	Aux. input 2 * (configurable)
	* Status displayed on LCD panel
<b>Front Panel Controls, Signals &amp; Alarms</b>	
	
Mimic Diagram	Represents the operational status of the UPS on Home Page of LCD
Operation LED	Visual (LED) when load is on inverter OR load is on bypass BLINK during service check
Alarm LED	Visual (LED) and audible signal, activates approx. 3 minutes
Warning LED	Visual (LED) and audible signal active when any alarm condition is BLINK when alarm is active and not acknowledged
Load Level / Battery Run Time	Bar graph status indicator on Home Page of LCD Load level in %, Battery run time in min.
Multilanguage Graphic LCD	Display of UPS metering functions , event history, configuration of supports 14 Languages (Chinese, Czech, Dutch, English, Espanola, Francais, German, Italiano, Polish , Portuguese, Russian, Slovensko, Soumi, Swedish)
Push Buttons	-Inverter On -Inverter Off -Total Off with protective cover
<b>Optional Features</b>	
RPA	-Redundant Parallel Operation & Intelligent Energy Management Integrated (IEMI)
eBoost™ (with Patented Efficiency Boost operation)	-High Efficiency Operating Mode for Single and Multi module applications
RPA Cable Saver Inductor	-Simplify Parallel Systems installation & Improve current sharing
11th Harmonic Input Filter	-Integral to UPS cabinet. No additional cabinet required
Input/Output Transformers	-Available in external cabinets for isolation or voltage
External Maintenance Bypass	-Available in external cabinet or as a part of output switchgear cabinet
Internal Maintenance Bypass	-Integral to UPS cabinet. No additional cabinet required
Dual Input	-Integral to UPS cabinet. No additional cabinet required
Remote Status Panel	-Active mimic diagram w/ Stop Operation and Summary Alarms
Protection Software	-PC operated remote monitoring, control and diagnostics
SNMP Communication	-Ethernet interface for network connection



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Mechanical Data



500 kVA Enclosure

	Dimensions (inches / mm)		
	Width (W)	Depth (D)	Height (H)
	80.7 / 2050	33.4 / 850	76.7 / 1950
Configuration	Weight (lbs./ Kg)	floor load (lbs./sq ft / Kg/sq m)	
With 5th filter	5226 / 2370.5	278.3 / 817.4	
With 5th & 11th filter	5246 / 2379.5	279.4 / 820.5	

UPS Block Diagram

	Standard Configuration	With Separate Bypass Mains
1.....Rectifier		
2.....Inverter		
3.....Static Bypass		
4.....Load switch		
5.....Utility		
6.....Load Output		
7.....Battery		
8.....RPA Cable Saver Inductor (optional)		
FB.....Battery Fuses or Circuit Breaker		
FB, 1, 2, 3.....AC Input Fuses or Circuit Breaker		



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