



Technical Data Sheet Digital Energy™ SG Series (400kVA)

GENERAL DATA	
Topology	True On-line double conversion
Nominal output power at PF = 0.7 lag. to 0.8 lag.	kVA 400
System efficiency	100% load, 0.8 PF : % 94.0
	50% load, 0.8 PF : % 94.2
Heat rejection at 100% load, 0.8PF and charged battery	BTU/hr 69,712
	kW 21.42
Cooling Air (77°F - 86°F / 25°C - 30°C)	CFM 3,597
Audible noise level (at 5 ft.)	dB(A) 65
Operating temperature range	UPS : 32°F - 104°F (0°C - 40°C) Battery : 68°F - 77°F (20°C - 25°C) <small>(Note: Higher temperatures shorten battery life)</small>
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) <small>(Note: Higher temperatures reduce battery storage time)</small>
Relative humidity	0-95%, non-condensing
Maximum altitude	Without derating : 3281ft (no derating) With derating : 4921ft/-5% 6562ft/-9% 8202ft/-14% 9843ft/-18%
Enclosure	Type : Indoor (IP20) and NEMA PE 1 Safety : Internal dead front construction Cooling : Forced Air (Redundant Fans) Color : White (RAL 9010)
Installation	Rigging : Suitable for handling by forklift Mounting : Floor mounting holes provided Installation and maintenance access : Front access required for normal maintenance Conduit Access : Top and Bottom standard
Standards	UL 1778, IEC 62040, ISO9001, FCC Class A Optional
Electrostatic discharge immunity	4kV contact / 8kV air discharge
Configuration	Standard : Stand-alone Optional : RPA™ - up to 8 units may be paralleled in any combination for redundancy or capacity



RECTIFIER			
Configuration		Six 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)	
	Power factor :	0.8 lagging (typical)	
	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		
Data	SG Series (kVA)	400	
Nominal input (100% load) (0.8 PF load, fully chrg'd bat.)	Current[A] :	512.0	
	kVA :	425.5	
	kW :	340.4	
Maximum input (100% load) (0.8 PF load, max. chrg current)	Current[A] :	615.0	
	kVA :	511.0	
	kW :	404.2	
Max. charge current	0.8 PF load :	110	

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	
Data	SG Series (kVA)	400	
100% load, 0.8 PF lag.	kWB:	335.4	
Maximum Discharge Current	[A]:	848.0	

NOTE 1: The Bypass input must be fed from a grounded-WYE electrical system. The 3-wire input kit (optional) is required if the neutral conductor is not brought to the bypass input. The load cannot use neutral unless the bypass input feeder includes neutral.



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	Greater than 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 0.8 PF for 10 minutes 150% at 0.8 PF for 60 seconds
Short circuit capability (on inverter)	700% of rated current for first 1.2 ms, followed by 220% for 100 ms, electronically limited
Data	SG Series (kVA)
	400
	Maximum Output Current @ 0.8pf [A]:
	481.0

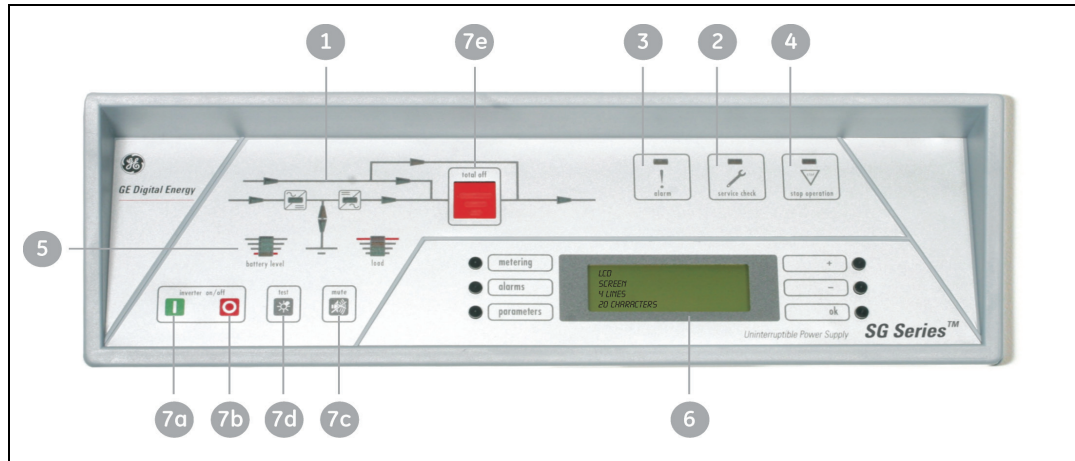
Bypass	
Input configuration	Common with rectifier (default) or dual input
Primary components	Full load rated static switch Back feed protection Internal maintenance bypass
Transfer limits	+/- 10% of nominal output voltage (adjustable)
Overload capability (on bypass)	110% continuous 200% for 5 minutes
Short circuit capability (on bypass)	1000% for 1/2 cycle (non-repetitive)

External Interface	
Alarm contacts (voltage-free)	Standard : 6 user defined contacts (form 'C') Optional : 12 user defined contacts (form 'C') (23 selectable signals include aux. Inputs 1 & 2)
Serial communication	RS-232
Input signals	Emergency Power Off (user supplied N.C. contact) Aux. input 1 * (default = On Generator) Aux. input 2 * (default = not defined) * Status displayed on LCD panel

NOTE 1: The Bypass input must be fed from a grounded-WYE electrical system. The 3-wire input kit (optional) is required if the neutral conductor is not brought to the bypass input. The load cannot use neutral unless the bypass input feeder includes neutral.



Front Panel Controls, Signals & Alarms



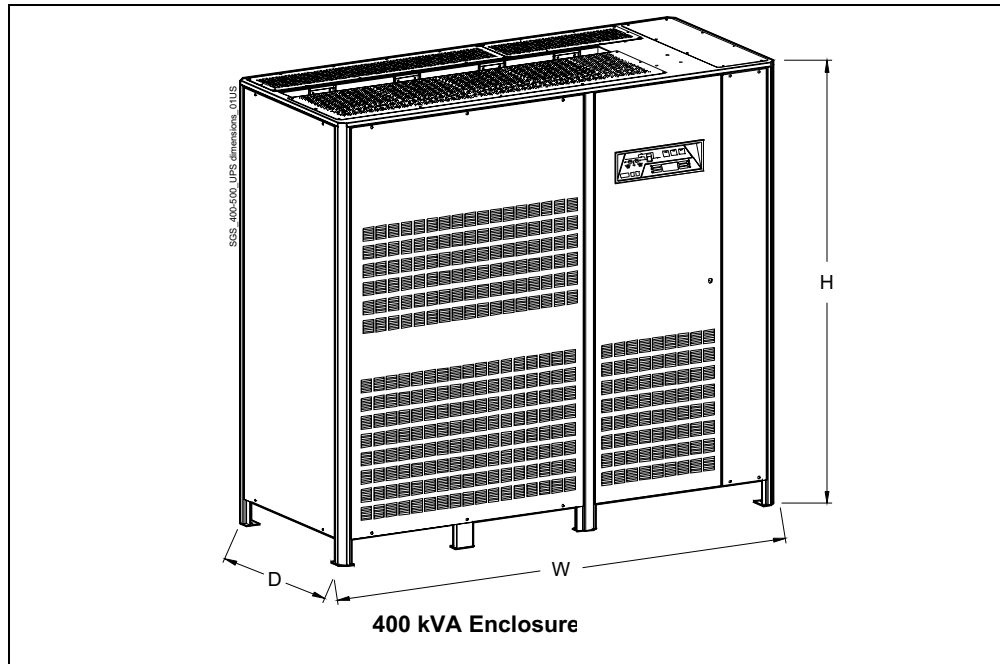
- (1) Mimic Diagram: Represents the operational status of the UPS, with integrated LEDs and power flow indicators
- (2) Service Check LED: Turns on when service is due or the internal manual bypass is active
- (3) Common Alarm: Visual (LED) and audible signal active when any alarm condition is present
- (4) Stop Operation: Visual (LED) and audible signal, activates approx. 3 minutes (adjustable) before complete and automatic load shutdown (due to a fully discharged battery or an over temperature condition with utility power not available)
- (5) Load Level / Battery Run Time: Bar graph status indicator
- (6) LCD Display: Display of UPS metering functions and event history (multi-language)
- (7) Push Buttons:
 - (7a) - Inverter On
 - (7b) - Inverter Off
 - (7c) - Alarm Silence
 - (7d) - Lamp Test
 - (7e) - Load Off with protective cover

Optional Features

- RPA™ - Redundant Parallel Operation and Intelligent Energy Management (IEM)
- Input/Output Transformers - Available in external cabinets for isolation or voltage transformation
- 5th Harmonic Input Filter - Integral to UPS cabinet. No additional cabinet required
- 11th Harmonic Input Filter - Integral to UPS cabinet. No additional cabinet required
- External Maintenance Bypass - Available in 2 or 3 breaker, panel mounted configurations
- 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
- FCC Filter - Brings UPS into compliance with FCC, Class A Specifications
- 3 Wire Input Kit - Enables UPS to be fed from a 3-wire circuit from a grounded WYE source for 3-phase loads only



Mechanical Data



UPS Rating (kVA)	Dimensions			Weight	
	Height (H)	Width (W)	Depth (D)	UPS	Floor Loading
400	77"	81"	33.5"	4918 lbs	263 lbs/sq.ft

UPS Block Diagram

- 1.....Rectifier
- 2.....Inverter
- 3.....Static Bypass
- 4.....Maintenance Bypass
- 5.....Utility
- 6.....Load Output
- 7.....Battery
- 8.....Battery Contactor
- FB.....Battery Fuses or Circuit Breaker
- F in.....AC Input Fuses or Circuit Breaker
- Lb.....Battery Line
- L in.....Input Line
- L out.....Output Line

