Digital Energy
Power Quality

# **Technical Data Sheet** Digital Energy SG Series
**(10-40kVA)**

| **General Data** | | | | | | |
|---|---|---|---|---|---|---|
| Topology | | | **True On-line double conversion** | | | |
| Nominal output power at PF = 0.7 lag. to 0.8 lag. | | **kVA** | **10** | **20** | **30** | **40** |
| System efficiency | 100% load, 0.8 PF : | **%** | 90.0 | 89.0 | 91.0 | 91.0 |
| | 50% load, 0.8 PF : | **%** | 89.5 | 88.7 | 90.5 | 90.5 |
| Heat rejection at 100% load, 0.8PF and charged battery | | **BTU/hr** | 3,036 | 6,751 | 8,104 | 10,808 |
| | | **kW** | 0.89 | 1.98 | 2.37 | 3.17 |
| Cooling Air (77°F - 86°F / 25°C - 30°C) | | **CFM** | 135 | 301 | 361 | 482 |
| Audible noise level (at 5 ft.) | | **dB(A)** | 60 | 60 | 60 | 60 |
| | | | | | | |
| 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)** | | | | |
| | | (Note : Higher temperatures reduce battery storage time) | | | | |
| 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)** | | **10** | **20** | **30** | **40** |
|---|---|---|---|---|---|---|
| **Nominal input (100% load)** | | Current[A] : | 17.2 | 27.3 | 40.4 | 53.9 |
| (0.8 PF load, fully chrg'd bat.) | | kVA : | 14.3 | 22.7 | 33.6 | 44.8 |
| | | kW : | 11.2 | 17.7 | 26.4 | 35.1 |
| **Max. input (100% load)** | | Current[A] : | 20.2 | 36.6 | 53.1 | 63.2 |
| (0.8 PF load, max. chrg current) | | kVA : | 16.8 | 30.4 | 44.1 | 52.5 |
| | | kW : | 12.9 | 23.4 | 33.9 | 40.4 |
| **Max. charge current** | | 0.8 PF load : | 5 | 10 | 10 | 15 |

**NOTE 1:** The Bypass input must be 480V/277V, 3-Phase, 4-Wire, WYE, plus ground. Fed from a grounded-WYE electrical system.

| 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) | | 10 | 20 | 30 | 40 |
|---|---|---|---|---|---|---|
| | **100% load, 0.8 PF lag.** | kWB: | 8.6 | 17.2 | 25.6 | 34.1 |
| | **Maximum Discharge Current** | [A]: | 21.7 | 43.4 | 64.6 | 86.1 |

| 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**<br>**150% at 0.8 PF for 60 seconds** |
| Short circuit capability (on inverter) | | **700% of rated current for first 1.2 ms, followed by**<br>**220% for 100 ms, electronically limited** |

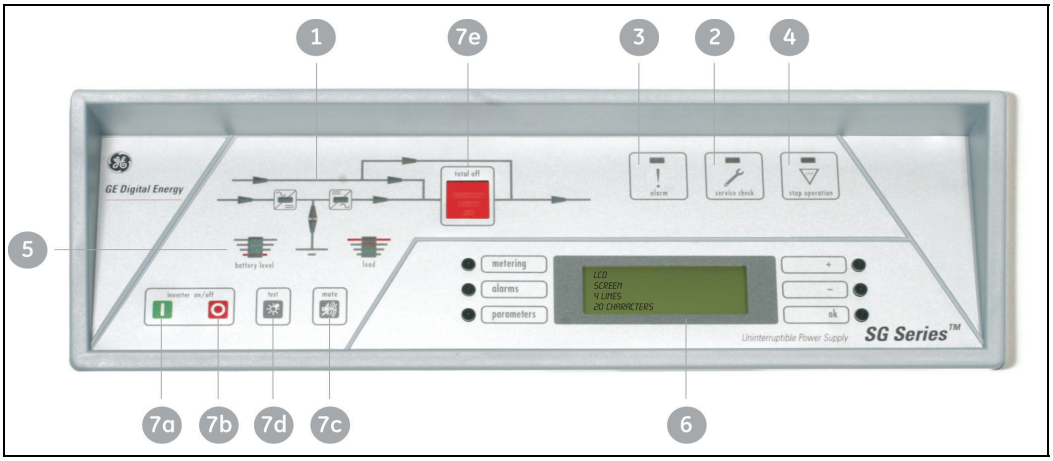
| Data | SG Series (kVA) | 10 | 20 | 30 | 40 |
|---|---|---|---|---|---|
| | **Maximum Output Current @ 0.8pf [A]** | 12.0 | 24.1 | 36.1 | 48.2 |

| Bypass | |
|---|---|
| Input configuration | **Common with rectifier (default) or dual input** |
| Primary components | **Full load rated static switch**<br>**Back feed protection**<br>**Internal maintenance bypass** |
| Transfer limits | **+/- 10% of nominal output voltage (adjustable)** |
| Overload capability (on bypass) | **110% continuous**<br>**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)**<br>**Aux. input 1 * (default = On Generator)**<br>**Aux. input 2 * (default = not defined)**<br>*** Status displayed on LCD panel** |

**NOTE 1:** The Bypass input must be 480V/277V, 3-Phase, 4-Wire, WYE, plus ground, fed from a grounded-WYE electrical system.

## Front Panel Controls, Signals & Alarms

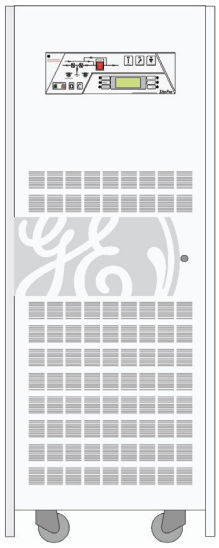



| | |
|---|---|
| (1) Mimic Diagram: | Represents the operational status of the UPS, with integrated LEDs and power flow indicators |
| (2) Service Check LED: | Turns on when service is due or the internal manual bypass is active |
| (3) Common Alarm: | Visual (LED) and audible signal active when any 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 normal 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<br>(7b) - Inverter Off<br>(7c) - Alarm Silence<br>(7d) - Lamp Test<br>(7e) - Load Off with (protective cover) |

## Optional Features

| | |
|---|---|
| RPA™ | - Redundant Parallel Operation and Intellegent 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 |
| 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 |
| Internal Batteries | - Internal batteries available for 10kVA units with 14 min. of runtime and 20kVA units with 5 min. of runtime |

## Mechanical Data



**10-40 kVA Enclosure**

| UPS Rating (kVA) | Dimensions | | | Weights lbs | | Floor Loading lbs/sq ft | |
|---|---|---|---|---|---|---|---|
| | Height | Width | Depth | UPS | w/Batts | UPS | w/Batts |
| **10** | 71" | 27" | 31.5" | 735 | 1,121 | 126 | 192 |
| **20** | 71" | 27" | 31.5" | 763 | 1,169 | 131 | 200 |
| **30** | 71" | 27" | 31.5" | 970 | NA | 165 | NA |
| **40** | 71" | 27" | 31.5" | 1,147 | NA | 196 | NA |

## 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