

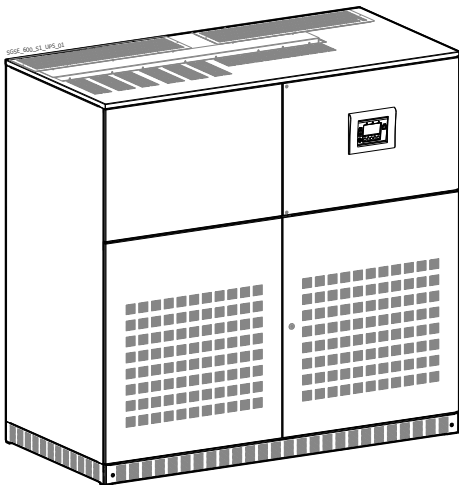
GE  
Critical Power

# Technical Data Sheet

Uninterruptible Power Supply

*SG Series 600*

600kVA / 400Vac CE / S2



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imagination at work



Model: **SG Series 600 CE S2**

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<b>Up-dating</b>		
Revision	Concern	Date
2.0	ECN 1628 (Input current THD)	06.12.2011
3.0	ECN 1825: Start-Up key & Update template	20.04.2013

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The illustrations and plans describing the equipment are intended as general reference only and are not necessarily complete in every detail.

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**GENERAL DATA**

Topology	<b>VFI, double conversion with integrated transformer</b>		
Nominal output apparent power from PF=0.6 lag. to 0.9 lag. and at 0.9 leading	<b>KVA</b>	<b>600</b>	
Nominal output active power from PF=0.9 lag. to 0.9 leading	<b>kW</b>	<b>540</b>	
Overall efficiency at 100% load PF=0.9 lag. in VFI mode		<b>93.0%</b>	
Overall efficiency at 75% load PF=0.9 lag. in VFI mode	<b>% (+/- 0.2%)</b>	<b>93.6%</b>	
Overall efficiency at 50% load PF=0.9 lag. in VFI mode		<b>93.7%</b>	
Overall efficiency at 100% load in SEM mode	<b>% (+/- 0.2%)</b>	<b>98.4%</b>	
Heat dissipation at 100% load in VFI mode, PF=0.8 lag. & charged battery	<b>kW</b>	<b>36.13</b>	
Heat dissipation at 100% load in VFI mode, PF=0.9 lag. & charged battery		<b>40.65</b>	
Cooling air (25°C ÷ 30°C)	<b>m³/h</b>	<b>10'540 (PF=0.8)</b>	<b>11'860 (PF=0.9)</b>
Audible noise level	<b>dB(A)</b>	<b>75</b>	
Battery type	<b>Valve regulated lead-acid (VRLA), vented lead-acid, NiCd</b>		
Operating temperature range	<b>UPS: 0°C ÷ 40°C</b>		
Storage temperature range	<b>UPS: -25°C ÷ +55°C</b>	<b>Battery: -20°C ÷ +40°C</b> (higher the temperature, shorter the storage time of the battery)	
Relative Humidity	<b>Max. 95% (non-condensing)</b>		
Max. altitude without power derating	<b>1000m</b>		
Power derating (according to EN/IEC 62040-3)	<b>1500m: -2.5%</b>	<b>/</b>	<b>2000m: -5%</b> / <b>2500m: -7.5%</b> / <b>3000m: -10%</b>
Protection degree	<b>IP 20 (IEC 60529)</b>		
Standards	<b>EN/IEC 62040, CE marking</b>		
EMC (Electromagnetic Compatibility)	<b>EN/IEC 62040-2</b>		
Electrostatic discharge immunity	<b>4kV contact / 8kV air discharge</b>		
Internal protection	<b>All live parts shrouded</b>		
Transport	<b>Cabinet suitable for handling by forklift</b>		
Colour	<b>RAL 9003 (white)</b>		
Installation	<b>Can be positioned against a wall and floor fixed</b>		
Service access	<b>Front and top access only</b>		
External cable connections	<b>Bottom at front of the cabinet (top as option)</b>		
Cooling	<b>Enforced ventilation with fan failure detection</b>		
Paralleling (RPA version)	<b>Up to 6 units parallelable for redundancy or capacity in RPA configuration (optional).</b>		

**RECTIFIER**

Rectifier bridge	<b>Three phase, 6 thyristors, overtemperature protection</b>		
Standard input voltage	<b>Nominal: 3 x 380V / 400V / 415V + N</b> <b>Rectifier accepted ph-ph voltage range: 340V ÷ 460V</b>		
Other input voltages	<b>On request</b>		
Input frequency	<b>50 Hz +/-10% (45 ÷ 55 Hz)</b>		
Power factor (at full load)	<b>0.9</b>	<b>0.92 with option 11<sup>th</sup> harmonic filter</b>	
Input current THD at nominal load (Typ)	<b>6%</b>	<b>5% with option 11<sup>th</sup> harmonic filter</b>	
Inrush current	<b>Limited by soft-start circuit</b>		
Power walk-in	<b>15 seconds</b>		
Output voltage tolerance	<b>+/- 1%</b>		
DC voltage ripple	<b>&lt;1%</b>		
DC current ripple	<b>Max. 5% the battery capacity [Ah], expressed in A</b>		
Battery charging characteristic	<b>IU (DIN 41773), T° compensated floating voltage</b>		
Battery charging current limit	<b>Programmable</b>		
<b>Input power data</b>		<b>kVA</b>	<b>600</b>
Input power at inverter nominal load and charged battery	at PF=0.8 lag.	<b>kW</b>	<b>516.2</b>
	at PF=0.9 lag.		<b>580.6</b>
Max. input power at inverter nominal load and max. battery recharge current (programmable)		<b>kW</b>	<b>620</b>
Max. battery charging current (programmable) at the beginning of battery recharge at nominal load	at PF=0.8 lag.	<b>A</b>	<b>265</b>
	at PF=0.9 lag.		<b>100</b>

**BATTERY**

Battery type	Valve regulated lead-acid (VRLA)-standard, Vented lead-acid, wet battery and NiCd		
Float voltage at 20°C	400V ÷ 436V (dependent on the number of cells)		
Number of cells	VRLA at 2.27V/cell: 177÷192 cells		
	Vented lead acid at 2.23V/cell, no boostcharge: 180÷195 cells		
	Vented lead acid at 2.23V/cell, with boostcharge at 2.35 V/cell: 180÷185 cells		
	NiCd at 1.41V/cell, no boostcharge: 284÷309 cells		
Min. discharge voltage (programmable)	Up to 310V (dependent on the number of cells)		
Recharge time	<5 hours up to 90% of battery capacity		
"Battery to earth" fault detection	Standard		
Automatic and manual battery test	Standard		
<b>Battery power data</b>	<b>kVA</b>	<b>600</b>	
DC power at full load and PF=0.8	<b>kW</b>	<b>505</b>	
DC power at full load and PF=0.9	<b>kW</b>	<b>569</b>	
DC power at full typical computer load (PF=0.66)	<b>kW</b>	<b>417</b>	

**INVERTER**

Nominal output apparent power from PF=0.6 lag. to 0.9 lag. & 0.9 lead.	<b>600 kVA</b>		
Nominal output voltage (on site programmable)	<b>3 x 380V / 400V / 415V + N</b>		
Inverter bridge	<b>SVM (Space Vector Modulation) and IGBT technology</b>		
Output transformer (for galvanic separation)	<b>Standard</b>		
Output waveform	<b>Sine wave</b>		
Output voltage tolerance:			
- static .....	<b>+/- 1%</b>		
- dynamic (at load step 0 - 100 - 0%) .....	<b>+/- 3%</b>		
- dynamic (at load step 0 - 50 - 0%) .....	<b>+/- 2%</b>		
- recovery time to +/-1% .....	<b>5 ms</b>		
- output voltage THD for 100% linear load .....	<b>Max. 1%</b>		
- output voltage THD for 100% non-linear load (EN 62040) .....	<b>Max. 3%</b>		
Output voltage tolerance at 100% unbalanced load (Ph-N)	<b>+/- 3%</b>		
Output frequency	<b>50/60 Hz (selectable)</b>		
Output frequency tolerance:			
- free-running .....	<b>+/- 0.1%</b>		
- with mains synchronisation adjustable to .....	<b>+/- 4%</b>		
Phase displacement:			
- at 100% balanced load .....	<b>120°: +/- 1%</b>		
- at 100% unbalanced load .....	<b>120°: +/- 3%</b>		
Overload capability (at 25°C ambient temperature)	<b>125% - 10 minutes, 150% - 1 minute</b>		
Short-circuit characteristic	<b>Electronic short-circuit protection, current limit to: 2.7 times In for 200 ms between phase and phase 4.0 times In for 200 ms between phase and N/PE</b>		
MCCB clearance capability (selectivity)	<b>20% In within 5-10ms (with MCCB class C or magn. trip at max. 10In)</b>		
Crest factor	<b>&gt;3:1</b>		

**BYPASS**

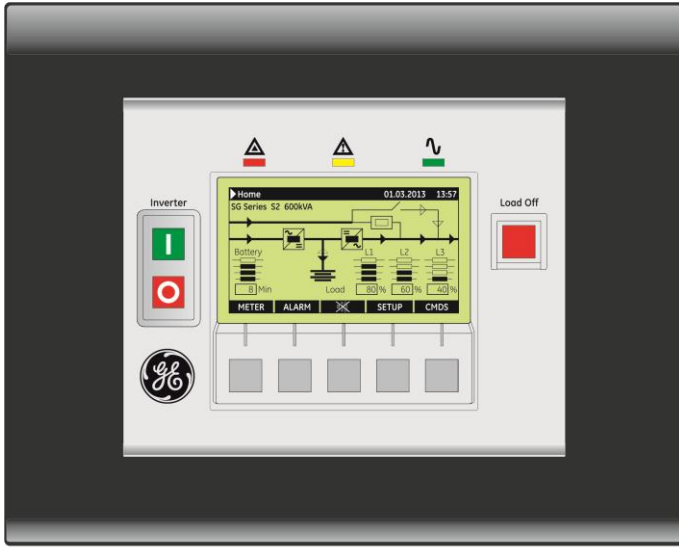
Input connection	<b>Separate for rectifier and bypass input or common to the rectifier input (option)</b>		
Primary components	- Static switch (SCR) on bypass		
	- Electromechanic contactors (backfeed protection) on bypass and inverter		
	- 2 manual switches for maintenance bypass		
Voltage limits for inverter/bypass load transfers	<b>+/- 10% (adjustable)</b>		
Overload on bypass	<b>Up to 125%: continuous</b>	<b>Up to 150%: 30 min.</b>	<b>45 times In for 10 ms, non repetitive</b>
	<b>Up to 175%: 10 min.</b>	<b>Up to 200%: 5 min.</b>	

**INTERFACING**

6 programmable signalling voltage-free contacts (available on block terminals)	- Standard information for easy integration and signalling - 27 user settable signals		
Connector RJ45	<b>Standard</b>		
Input signals	- EMERGENCY POWER OFF (n/c contact, customer supplied)		
	- GEN ON (emergency power supply ON, n/o contact, customer supplied)		
	- 1 auxiliary signal, with settable functionality		

Note: all indicated values are typical. Variations may be found from one unit to another.

**FRONT PANEL CONTROLS, SIGNALS AND ALARMS**



The control panel, positioned on the UPS front door, acts as the UPS user interface and comprises of the following elements:

- Back lit Graphic Display (LCD) with the following characteristics:
  - Multilanguage communication interface: English, German, Italian, Spanish, French, Finnish, Polish, Portuguese, Czech, Slovakian, Chinese, Swedish, Russian and Dutch;
  - Graphic diagram indicating UPS status.
- Command keys and parameters setting.
- UPS status control LED.

**OPTIONS**

**COMMUNICATION:**

1. Additional Customer Interface Card
2. 3-ph SNMP/WEB plug-in adapter
3. GE iUPSGuard
4. GE Data Protection
5. RSB - Remote Signalling Box (cable for connection to UPS not included)

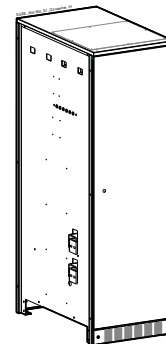
**BUILT-IN UPS OPTIONS:**

1. RPA kit (Redundant Parallel Architecture)
2. Kit for common input mains
3. Auxiliary Power Supply (APS) 24Vdc
4. Surge suppressors
5. 11<sup>th</sup> harmonic filter

**OPTIONS IN ADDITIONAL CABINETS:**

1. Battery isolator switch Q3 cabinet
2. Top entry cable cabinet
3. Battery isolator switch Q3 and Top entry cable cabinet

Dimensions (WxDxH):  
570 x 950 x 1900mm

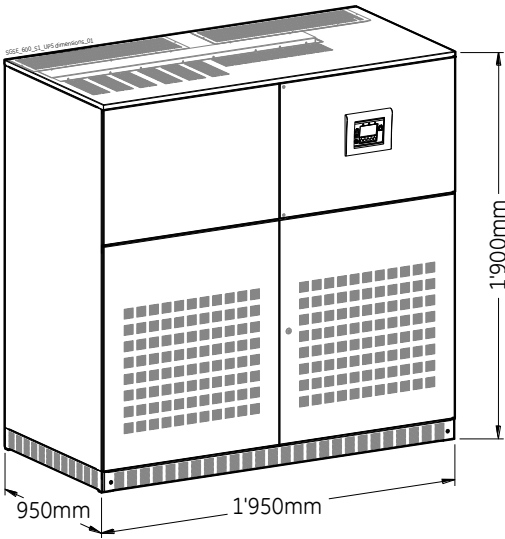


**EXTERNAL ACCESSORIES:**

- |  |                       |
|--|-----------------------|
| 1. ISM - Intelligent Synchronization Module                    | 350mm x 190mm x 584mm |
| 2. Parallel output cabinet with centralized maintenance bypass | On request            |
| 3. Battery fuses box   | On request            |

**TECHNICAL DATA**

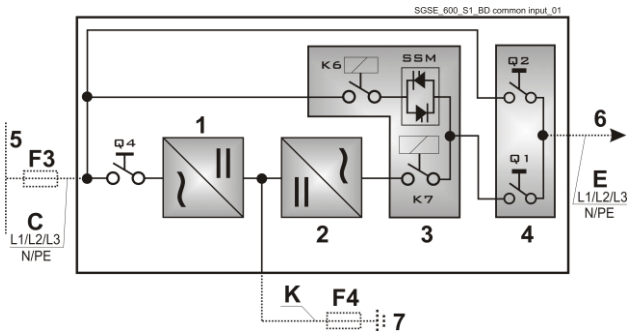
SG Series 600



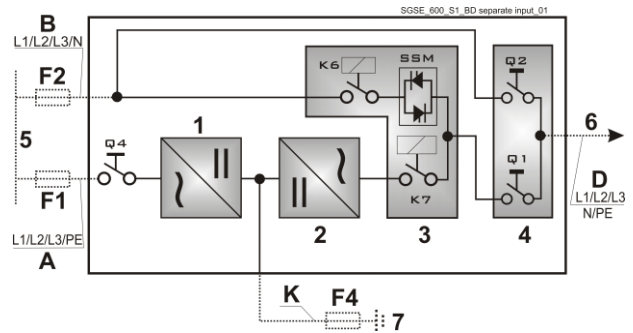
Dimensions and weights SG Series 600	
Dimensions UPS standard (WxDxH):	1950 x 950 x 1900 mm
Weight UPS standard:	2950 kg
Floor loading UPS standard:	1592 kg/m <sup>2</sup>

**UPS BLOCK DIAGRAM, PROTECTIONS AND CABLE SECTIONS**

Common input Rectifier & Bypass



Separated input Rectifier & Bypass



- 1 = Rectifier
- 2 = Inverter
- 3 = Electronic Bypass
- 4 = Manual Bypass
- 5 = Mains
- 6 = Load
- 7 = External Battery
- F4 = External Battery Fuses

**Protections and cable sections**

Protections for mains voltages 380V, 400V, 415V Battery voltage 440Vdc		Cable sections recommended by European Standards Alternatively, local standards to be respected							
KVA	Fuses gL/gG or equivalent MCCB				Cable sections (mm <sup>2</sup> )				
	F1	F2	F3	F4	A	B	C & E	D	K
600	3x1250A	3x1000A	3x1250A	2x1600A	3(3x240)+2x185	4(3x185)	4(3x240)+2x185	4(3x185)+2x120	2(4x240)+2x240

F1, F2, F3, F4, A, B, C, D, E, (K): supplied by customer      K: supplied by GE's Critical Power only with battery      F4 and Q3: can be supplied by GE's Critical Power

**IMPORTANT NOTE !**

The UPS is designed for TN System.  
 The input neutral shall be grounded at source and shall never be disconnected.  
 4 pole breaker shall not be used at the UPS input (see also IEC 60364, IEC 61140, IEC 61557).