

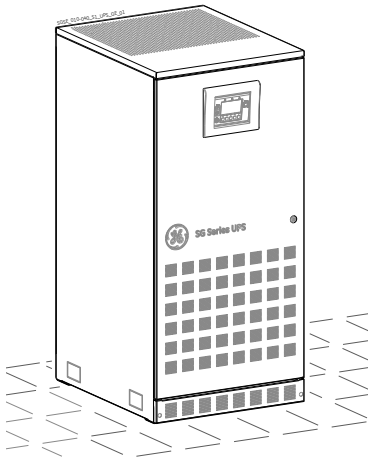
GE  
Critical Power

# Technical Data Sheet

Uninterruptible Power Supply

*SG Series 10 – 40 PurePulse™*

10 – 15 – 20 – 30 – 40kVA / 400Vac CE / S1



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imagination at work



Model: **SG Series 10 – 15 - 20 – 30 - 40 PurePulse™ CE S1**

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Revision	Concern	Date
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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		VFI, static double conversion UPS with integrated transformer				
Nominal output apparent power at PF=0.6 lag. to 0.9 leading	KVA	10	15	20	30	40
Nominal output active power at PF=1	kW	10	15	20	30	40*
Overall efficiency in VFI mode	%	Up to 92.3				
Overall efficiency in SEM mode (Super Eco Mode)	%	Up to 98.0				
Heat dissipation at 100% load in VFI mode, PF=0.8 lag. & charged battery	kW	0.65	1.11	1.27	2.18	2.69
Heat dissipation at 100% load in VFI mode, PF=0.9 lag. & charged battery	kW	0.73	1.25	1.43	2.46	3.03
Cooling air at PF=0.8 (25°C ÷ 30°C)	m <sup>3</sup> /h	189	323	371	637	785
Cooling air at PF=0.9 (25°C ÷ 30°C)	m <sup>3</sup> /h	212	364	417	717	883
Audible noise level	dB(A)	58	58	58	65	65
Battery type	Valve regulated lead-acid (VRLA)-standard, Vented lead-acid, wet battery and NiCd					
Operating temperature range	UPS: 0°C ÷ 40°C Battery: 20°C ÷ 25°C recommended					
Storage temperature range	UPS: -25°C ÷ +55°C    Battery: -20°C ÷ +40°C (higher the temperature, shorter the storage time of the battery)					
Storage time of the battery without recharge at 20°C	Max. 6 months					
Relative humidity	Max. 95% (non-condensing)					
Max. altitude without power de-rating	1000m					
Power de-rating (according to EN/IEC 62040-3)	1500m: -2.5% / 2000m: -5% / 2500m: -7.5% / 3000m: -10%					
Protection degree	IP 20 (IEC 60529)					
Standards	EN/IEC 62040, CE marking					
EMC (Electromagnetic Compatibility)	EN/IEC 62040-2 Category C2					
Electrostatic discharge immunity	4kV contact / 8kV air discharge					
Internal protection	All internal live parts shrouded					
Transport	Cabinet suitable for handling by forklift					
Colour	RAL 9003 (white)					
Installation	Can be positioned against a wall and floor fixed					
Service access	Access required at front and top					
External cable connections	Bottom at front of the cabinet (standard)					
Cooling	Forced bottom to top by internal fans					
Paralleling (RPA version)	Up to 6 units for redundancy or capacity in RPA configuration (optional)					

**RECTIFIER**

Rectifier bridge	Three phase, IGBT rectifier, PurePulse™ technology, over-temperature protection						
Standard input voltage	Nominal: 3 x 380V / 400V / 415V + N Rectifier accepted ph-ph voltage range: 340V ÷ 460V						
Other input voltages	On request						
Input frequency	50/60 Hz +/-10% (45 ÷ 66 Hz)						
Power factor	0,99						
Input current THD	<3% at 100% load		<5% at 50% load				
Inrush current	Limited by soft-start circuit						
Power walk-in	15 seconds						
Output voltage tolerance	+/- 1%						
DC voltage ripple	<1%						
Battery charging characteristic	IU (DIN 41773), T° compensated floating voltage						
Battery charging current limit	Programmable						
<b>Input power data</b>	kVA	10	15	20	30	40	
Input power at inverter nominal load and charged battery	kW	at PF=0.8 lag.	8.7	13.2	17.4	26.4	34.9
		at PF=1	10.9	16.5	21.7	33.0	43.7
Max. input power at inverter nominal load And max. battery recharge current (programmable)	kW	11.7	16.8	21.8	32.7	43.5	
Max. battery charging current (programmable) at the beginning of battery recharge at nominal load	A	at PF=0.8 lag.	11	13	17	25	33
		at PF=1	5	5	6	8	11

\*) at 30°C operating temperature

**BATTERY**

Battery type	Valve regulated lead-acid (VRLA)-standard, Vented lead-acid, wet battery and NiCd					
Number of 12V blocks, 6 cells/block	30 to 32 (30 blocks can be mounted in the UPS cabinet)					
Float voltage at 20°C	405V ÷ 436V (dependent on the number of blocks)					
Min. discharge voltage (programmable)	1.65Vdc/cell					
Recharge time	<5 hours up to 90% of battery capacity					
"Battery to earth" fault detection	Standard					
Automatic and manual battery test	Standard					
Manual battery contactor	Standard, with automatic safety disconnection					
<b>Battery power data</b>	<b>kVA</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>30</b>	<b>40</b>
DC power at full load and PF=0.8	<b>kW</b>	<b>8.4</b>	<b>12.6</b>	<b>16.8</b>	<b>25.3</b>	<b>33.7</b>
DC power at full load and PF=0.9	<b>kW</b>	<b>9.5</b>	<b>14.2</b>	<b>18.9</b>	<b>28.4</b>	<b>37.9</b>
DC power at full load and PF=1.0	<b>kW</b>	<b>10.5</b>	<b>15.8</b>	<b>21.1</b>	<b>31.6</b>	<b>42.1</b>
Matching battery cabinets	See table on page 5 and 6					

**INVERTER**

Nominal Total output power	10 – 15 – 20 – 30 – 40 kVA/kW					
Nominal output voltage (on site programmable)	3 x 380V / 400V / 415V + N					
Inverter bridge	SVM (Space Vector Modulation) and IGBT technology					
Output transformer (for galvanic separation)	Standard					
Output waveform	Sine wave					
Output voltage tolerance:						
- static .....	+/- 1%					
- Dynamic (at load step 0 – 100 – 0%) .....	+/- 3%					
- Dynamic (at load step 0 – 50 – 0%) .....	+/- 2%					
- recovery time to +/-1% .....	<20 ms					
- output voltage THD for 100% linear load .....	<2%					
- output voltage THD for 100% non-linear load (EN 50091) .....	<3%					
Output voltage tolerance at 100% unbalanced load (Ph-N)	+/- 3%					
Output frequency	50/60 Hz (selectable)					
Output frequency tolerance:						
- free-running .....	+/- 0.1%					
- with mains synchronisation adjustable to .....	+/- 4%					
Phase displacement:						
- at 100% balanced load .....	120°: +/- 1%					
- at 100% unbalanced load .....	120°: +/- 2%					
Overload capability (@25°C ambient temperature)	125% - 10 minutes, 150% - 1 minute					
Short-circuit characteristic	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					
Protection clearance capability (selectivity)	20% In within 5-10 ms (with MCCB class C)					
Crest factor	>3:1					

**BYPASS**

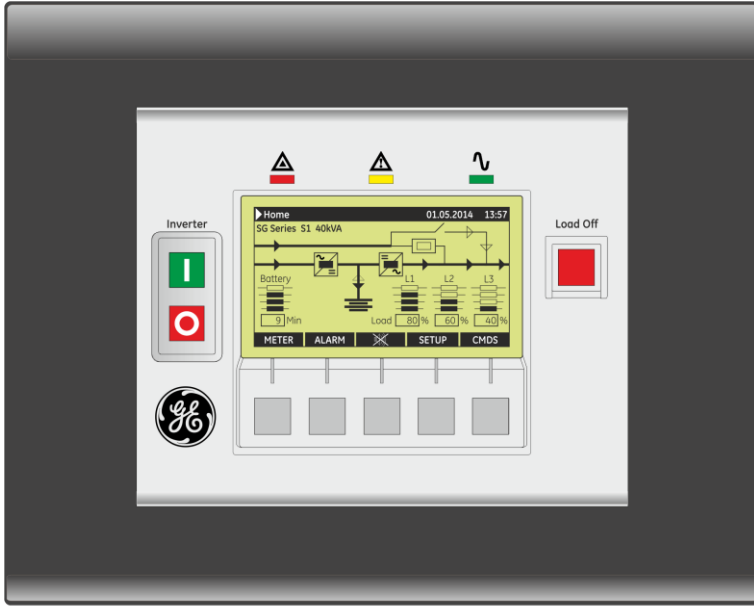
Input connection	Separate (dual input-recommended) or common to the rectifier input
Primary components	- Static switch (SCR) on bypass - Electro-mechanic contactor (back-feed protection) - Manual switch for maintenance bypass
Voltage limits for inverter/bypass load transfers	+/- 10% (adjustable)
Overload on bypass	200% for 1 minute and 35 times In for 10 ms, non repetitive

**INTERFACING**

6 programmable signalling voltage-free contacts (available on terminal blocks)	- Standard information for easy integration and signalling - 27 user settable signals
Serial channel RS232 (on Delta 9 pin connector)	Standard
Input signals	- EPO - Emergency Power Off (n/c contact, customer supplied) - GEN ON (emergency power supply ON, n/o contact, customer supplied) - 1 auxiliary signals with settable functionality
Auxiliary power supply	- 24Vdc auxiliary power supply (optional)

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

**CONTROL PANEL**



LCD\_SG\_010-040\_S1\_Front\_GE\_01GB

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. Modbus RTU or Modbus/TCP Interface (only license)
4. GE iUPSGuard
5. GE Data Protection
6. SEM – Super ECO Mode for single UPS (standard feature to be activated under a licence release)

**BUILT-IN UPS OPTIONS:**

1. RPA kit
2. Auxiliary Power Supply (APS) 24Vdc
3. Rectifier or bypass or UPS input transformer
4. Input / Output cable connection kit

	10 kVA	15 kVA	20 kVA	30 kVA	40 kVA
1. RPA kit	●	●	●	●	●
2. Auxiliary Power Supply (APS) 24Vdc	●	●	●	●	●
3. Rectifier or bypass or UPS input transformer	●*	●*	●*	●*	●*
4. Input / Output cable connection kit	●	●	●	●	●

\*) Mounted in UPS cabinet battery cavity, instead of battery

**OPTIONS IN ADDITIONAL CABINETS:**

Dimensions (WxDxH):

① 750 x 800 x 1450 mm

② 1100 x 800 x 1450 mm

1. Rectifier or bypass or UPS input transformer
2. Special voltages: input and/or output
3. Centralized maintenance bypass for RPA configuration
4. Empty battery cabinets

10 kVA	15 kVA	20 kVA	30 kVA	40 kVA
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On request

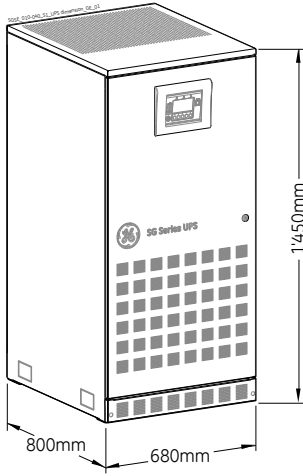
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On request

① ②

**TECHNICAL DATA**

**SG Series 10 – 40 PurePulse™**



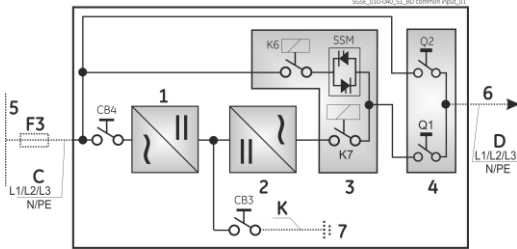
Dimensions  
(Width x Depth x Height):  
680 x 800 x 1450 mm

UPS (kVA)	Battery table		Dimensions		Weights				
	Autonomy time (Min.) ◆ ●	Battery capacity (Ah)	Battery cabinet (mm)	Total width (mm)	UPS (Kg)	Battery (Kg) ●	Battery + cabinet (Kg) ●	Total (Kg) ●	Floor loading (Kg/m <sup>2</sup> )
10	10	9Ah HR	in UPS	680	290	110	-	400	736
	24	2 x 9Ah HR	in UPS	680		220	-	510	938
	30	22Ah HR	in UPS	680		230	-	520	956
	51	33Ah HR	in UPS	680		335	-	625	1149
	80 (estimated)	50Ah HR	750	1430		-	600	890	1000 ●
	135 (estimated)	75Ah HR	750	1430		-	900	1190	1500 ●
15	5.5	9Ah HR	in UPS	680	290	110	-	400	736
	15	2 x 9Ah HR	in UPS	680		220	-	510	938
	19	22Ah HR	in UPS	680		230	-	520	956
	30	33Ah HR	in UPS	680		335	-	625	1149
	52	50Ah HR	750	1430		-	600	890	1000 ●
	85 (estimated)	75Ah HR	750	1430		-	900	1190	1500 ●
20	10	2 x 9Ah HR	in UPS	680	350	220	-	570	1048
	13	22Ah HR	in UPS	680		230	-	580	1066
	22	33Ah HR	in UPS	680		335	-	685	1260
	35	50Ah HR	750	1430		-	600	950	1000 ●
	60	75Ah HR	750	1430		-	900	1250	1500 ●
30	5.5	2 x 9Ah HR	in UPS	680	350	220	-	570	1048
	7.5	22Ah HR	in UPS	680		230	-	580	1066
	13	33Ah HR	in UPS	680		335	-	685	1260
	22	50Ah HR	750	1430		-	600	950	1000 ●
	36.5	75Ah HR	750	1430		-	900	1250	1500 ●
40	5	22Ah HR	in UPS	680	420	230	-	650	1195
	9	33Ah HR	in UPS	680		335	-	755	1388
	15.5	50Ah HR	750	1430		-	600	1020	1000 ●
	26	75Ah HR	750	1430		-	900	1320	1500 ●

◆ At full load and PF=0.8 lag. ● Based on BB Battery HR type ● Max. value for battery cabinet only

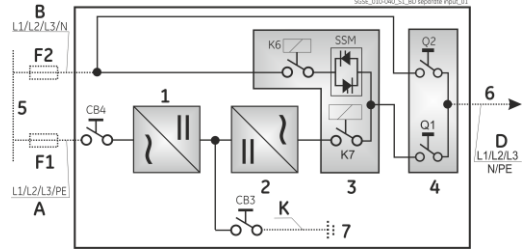
**UPS BLOCK DIAGRAM, PROTECTIONS AND CABLE SECTIONS**

**Common input Rectifier & Bypass**



1 = Rectifier  
2 = Inverter  
3 = Automatic Bypass  
4 = Manual Bypass

**Separated input Rectifier & Bypass**



5 = Mains  
6 = Load  
7 = Internal Battery

**Line protections and cable sections**

Protections for mains voltages 3 x 380V / 400V / 415V			Battery protection (if external)	Cable sections (mm <sup>2</sup> ) recommended by European Standards Alternatively, local standards to be respected				
kVA	F1	F2		F3	A	B	C & D	K (for external battery)
10	3 x 20A	3 x 20A	3 x 20A	2 x 40A	4 x 2.5	4 x 2.5	5 x 2.5	3 x 6
15	3 x 25A	3 x 25A	3 x 25A	2 x 63A	4 x 4	4 x 4	5 x 4	3 x 10
20	3 x 35A	3 x 35A	3 x 35A	2 x 63A	4 x 6	4 x 6	5 x 6	3 x 10
30	3 x 50A	3 x 50A	3 x 50A	2 x 100A	4 x 10	4 x 10	5 x 10	2 x 25 + 16
40	3 x 63A	3 x 63A	3 x 63A	2 x 100A	4 x 10	4 x 10	5 x 10	2 x 25 + 16

**Cable sections (mm<sup>2</sup>) recommended in Switzerland**

kVA	A	B	C & D	K (for external battery)
10	4 x 4	4 x 4	5 x 4	3 x 10
15	4 x 6	4 x 6	5 x 6	3 x 16
20	4 x 10	4 x 10	5 x 10	3 x 16
30	4 x 16	4 x 16	5 x 16	2 x 35 + 25
40	4 x 16	4 x 16	5 x 16	2 x 35 + 25

F1, F2, F3, A, B, C, D: supplied by customer  
Battery protection: can be supplied by GE.

**IMPORTANT NOTE!**

The UPS is designed for TN System. The input neutral shall be grounded at source and shall never be disconnected.  
3 pole breakers should be used upstream the UPS input (see also IEC 60364-1, IEC 61140 and IEC 61557).