

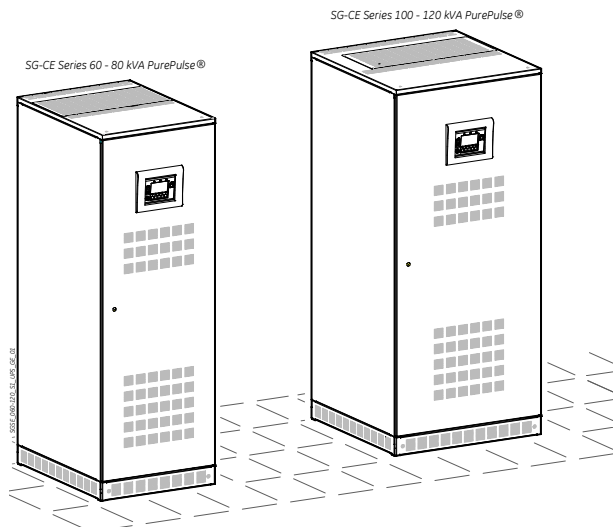
GE Digital Energy  
Power Quality

# Technical Data Sheets

Digital Energy™ Uninterruptible Power Supply

*SG-CE Series 60–80–100–120 kVA PurePulse®*

400 Vac CE – Series 1



**GE Consumer & Industrial SA**

General Electric Company  
CH – 6595 Riazzino (Locarno)  
Switzerland  
T +41 (0)91 / 850 51 51  
F +41 (0)91 / 850 51 44

[www.gedigitalenergy.com](http://www.gedigitalenergy.com)



GE imagination at work



Certified  
Quality System  
**ISO 9001**

Model: **SG-CE Series 60 – 80 – 100 – 120 kVA PurePulse® / Series 1**  
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Revision: 2.0  
Identification No.

<b>Up-dating</b>		
Revision	Concern	Date
2.0	ECN 1257 (Short-circuit characteristic) + 50Ah battery cabinet	15.12.2008

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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, double conversion with integrated transformer					
Nominal output power from PF=0.6 lag. to 0.9 leading		KVA/kW	60/54	80/72	100/90	120/108	
Overall efficiency at 100% load PF=0.9 lag. in VFI mode	+/-0.2%	%	91.4	91.4	91.7	91.2	
Overall efficiency at 75% load PF=0.9 lag. in VFI mode			(guaranteed values)	91.8	91.8	92.0	91.8
Overall efficiency at 50% load PF=0.9 lag. in VFI mode			91.9	91.9	91.9	92.1	
Overall efficiency at 100% load in SEM mode	+/-0.2%	%	97.9	97.9	97.8	97.9	
Heat dissipation at 100% load in VFI mode, PF=0.8 lag. & charged battery		kW	4.52	6.02	7.24	9.26	
Cooling air (25°C ÷ 30°C)		m³/h	1320	1760	2115	2710	
Audible noise level		dB(A)	63	63	63	63	
Battery type	Valve regulated lead-acid (VRLA), vented lead-acid, NiCd						
Operating temperature range	UPS: 0°C ÷ 40°C						
Storage temperature range	-25°C ÷ +55°C						
Relative Humidity	Max. 95% (non-condensing)						
Max. altitude without power derating	1000m						
Power derating (according to EN/IEC 62040-3)	1500m: -5% / 2000m: -9% / 2500m: -14% / 3000m: -18%						
Protection degree	IP 20 (IEC 60529)						
Standards	EN/IEC 62040, CE marking						
EMC	EN/IEC 62040-2 (Category C2 as option), Burst & Surges 2kV L-L, 4kV L-PE						
Electrostatic discharge immunity	8kV contact / 15kV air discharge						
Internal protection	All live parts shrouded						
Transport	Cabinet suitable for handling by forklift						
Colour	RAL 9003 (white), bottom air grids RAL 7021 (black)						
Installation	Can be positioned against a wall and floor fixed						
Service access	Front and top access only						
External cable connections	Bottom at front of the cabinet (top as option)						
Cooling	Enforced ventilation with fan speed control						
Paralleling (RPA version)	Up to 6 units parallelable for redundancy or capacity in RPA configuration (optional).						

## RECTIFIER

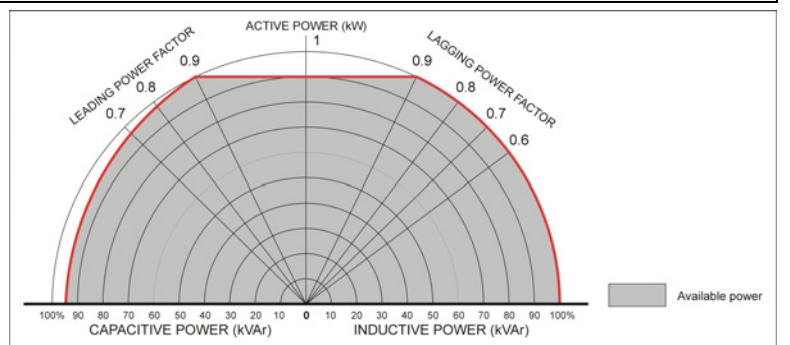
Rectifier bridge	Three phase, IGBT rectifier, PurePulse® technology, overtemperature protection					
Standard input voltage	Nominal: 3 x 380V / 400V / 415V + N Rectifier accepted ph-ph voltage range: 340V ÷ 460V					
Other input voltages	On request					
Input frequency	50/60 Hz +/-10% (45 ÷ 66 Hz)					
Power factor	0.99					
Input current THD	2% at 100% load	<2.5% at 75% load	<3% at 50% load			
Inrush current	Limited by soft-start circuit					
Power walk-in	15 seconds					
Output voltage tolerance	+/- 1%					
DC voltage ripple	<1%					
DC current ripple	Max. 5% the battery capacity [Ah], expressed in A					
Battery charging characteristic	IU (DIN 41773), T° compensated floating voltage					
Battery charging current limit	Programmable					

Input power data		kVA	60	80	100	120
Input power at inverter nominal load and charged battery	at PF=0.8 lag.	kW	52.5	70.0	87.3	105.3
	at PF=0.9 lag.	kW	59.1	78.8	98.2	118.5
Max. input power at inverter nominal load and max. battery recharge current (programmable)		kW	66.0	87.8	109.5	131.6
Max. battery charging current (programmable) at the beginning of battery recharge at nominal load	at PF=0.8 lag.	A	33	44	55	65
	at PF=0.9 lag.	A	17	22	27	32

## UPS OUTPUT POWER CAPABILITY

Output UPS power versus power factor for:

- Inductive loads
- Resistive loads
- Capacitive loads



**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				
Min. discharge voltage (programmable)	NiCd at 1.41V/cell, no boostcharge: 284÷309 cells				
	NiCd at 1.41V/cell, with boostcharge at 1.55 V/cell: 281 cells				
Recharge time	Up to 310V (dependent on the number of cells)				
"Battery to earth" fault detection	<5 hours up to 90% of battery capacity				
Automatic and manual battery test	Standard				
Automatic battery contactor	Standard				
<b>Battery power data</b>	<b>kVA</b>	<b>60</b>	<b>80</b>	<b>100</b>	<b>120</b>
DC power at full load and PF=0.8 lag.	<b>kW</b>	<b>50.8</b>	<b>67.8</b>	<b>84.7</b>	<b>101.6</b>
DC power at full load and PF=0.9 lag.	<b>kW</b>	<b>57.2</b>	<b>76.2</b>	<b>95.3</b>	<b>114.3</b>
DC power at full typical computer load (PF=0.66 lag.)	<b>kW</b>	<b>41.9</b>	<b>55.9</b>	<b>69.9</b>	<b>83.8</b>
Matching battery cabinets	See optional features on page 5				

**INVERTER**

Nominal output power at PF=0.6 ... 0.9 lag.	60 – 80 – 100 - 120 kVA				
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% .....	5 ms				
- output voltage THD for 100% linear load .....	Max. 1.5%				
- output voltage THD for 100% non-linear load (EN 62040) .....	Max. 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°: +/- 3%				
Overload capability (at 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				
MTCB clearance capability (selectivity)	20% In within 5-10ms (with MTCB class C or magn. trip at max. 10In)				
Crest factor	>3:1				

**BYPASS**

Input connection	Separate (dual input-recommended) or common to the rectifier input
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	+/- 10% (adjustable)
Overload on bypass	200% for 5 minutes & 45 times In for 10 ms, non repetitive

**INTERFACING**

6 programmable signalling voltage-free contacts (available on Delta and block terminals)	- Standard information for easy integration and signalling - 27 user settable signals
Serial channel RS232 (on Delta 9 pin connector)	Standard
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.

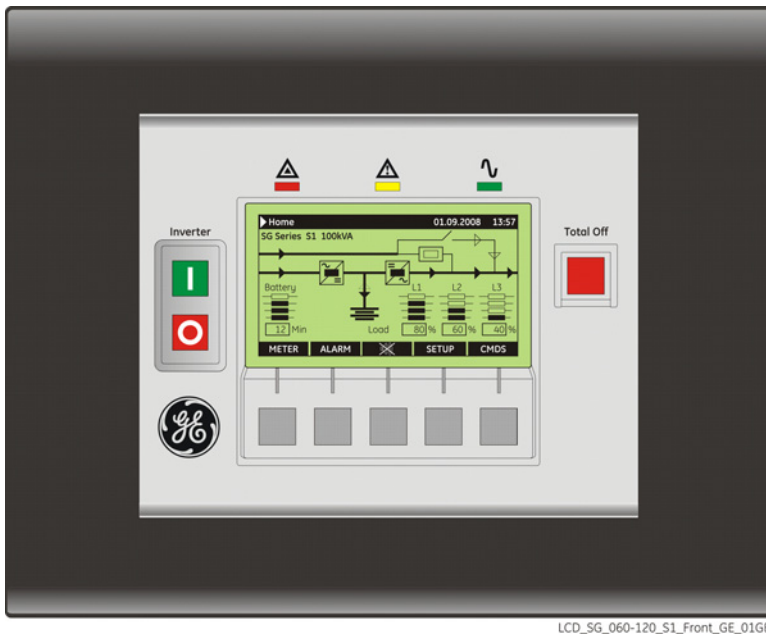
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Technical Data Sheets SG-CE Series 60-80-100-120 kVA PurePulse® / S1

## 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. Advanced SNMP Card
3. GE Power Diagnostics
4. GE Data Protection
5. RSB - Remote Signalling Box (cable for connection to UPS not included)

### BUILT-IN UPS OPTIONS:

1. RPA kit
2. Auxiliary Power Supply (APS) 24Vdc

### OPTIONS IN ADDITIONAL CABINETS:

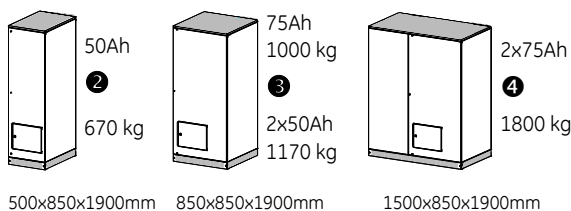
Dimensions (WxDxH): ① 350x850x1900mm ② 500x850x1900mm ③ 850x850x1900mm ④ 1500x850x1900mm

1. Rectifier or bypass or UPS input transformer
2. EMC filter EN/IEC 62040-2 Category C2 (Class A)
3. Top entry cables cabinet
4. Special voltages: input and/or output
5. Empty battery cabinets
6. Battery cabinet 50Ah (without fuses)
7. Battery cabinet 75Ah (without fuses)
8. Battery cabinet 2x50Ah (without fuses)
9. Battery cabinet 2x75Ah (without fuses)

②  
①  
On request  
② ③ ④

UPS (kVA)	BATTERY TABLE											
	At 75% load PF 0.8						At 100% load PF 0.8					
	50Ah	75Ah	2x50Ah	2x75Ah	4x50Ah	4x75Ah	50Ah	75Ah	2x50Ah	2x75Ah	4x50Ah	4x75Ah
60	13 min.	22 min.	31 min.	53 min.	77 min.	139 min.	9 min.	16 min.	22 min.	36 min.	53 min.	95 min.
80	9 min.	15 min.	22 min.	36 min.	52 min.	95 min.	6 min.	11 min.	16 min.	26 min.	36 min.	70 min.
100	-	12 min.	17 min.	27 min.	37 min.	65 min.	-	8 min.	12 min.	20 min.	28 min.	45 min.
120	-	9 min.	13 min.	22 min.	32 min.	51 min.	-	6 min.	9 min.	16 min.	22 min.	36 min.

These runtimes can be achieved only with our High Rate batteries.

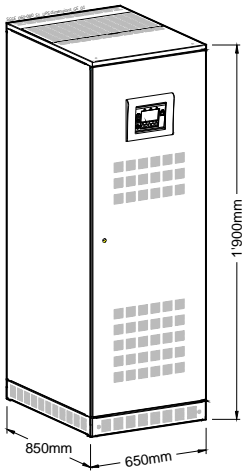


### EXTERNAL ACCESSORIES:

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-CE Series 60 & 80 kVA

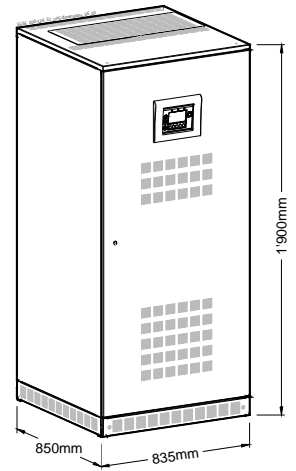


Dimensions (WxDxH):  
650mm x 850mm x 1900mm

### WEIGHTS (kg)

UPS Rating (kVA)	UPS cabinet		Additional cabinet		
	UPS standard (kg)	Floor loading UPS standard (kg/m <sup>2</sup> )	Rectifier or bypass transformer (500x850x1900mm)	EMC filter EN/IEC 62040-Cat. C2 (350x850x1900mm)	Top entry cables cabinet (350x850x1900mm)
60	550 kg	995	340 kg	110 kg	70 kg
80	630 kg	1140	380 kg	110 kg	70 kg
100	860 kg	1212	450 kg	125 kg	75 kg
120	860 kg	1212	450 kg	125 kg	75 kg

### SG-CE Series 100 & 120 kVA

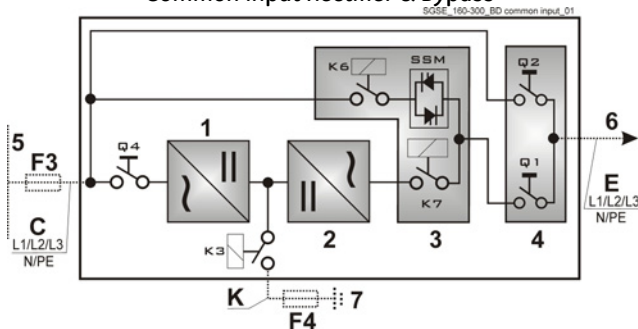


Dimensions (WxDxH):  
835mm x 850mm x 1900mm

Note: Single weights have to be added up for system configuration to get the total weight!

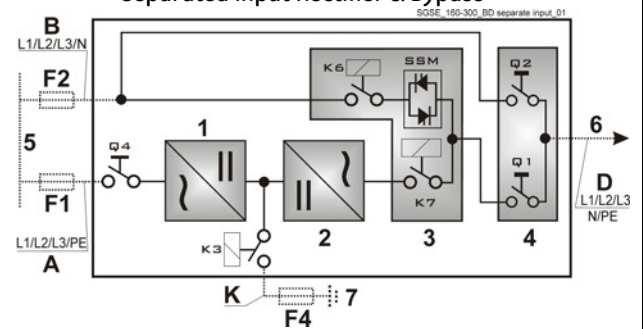
## UPS BLOCK DIAGRAM, PROTECTIONS AND CABLE SECTIONS

### Common input Rectifier & Bypass



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

### Separated input Rectifier & Bypass



5 = Mains  
6 = Load  
7 = External Battery  
F4 = External Battery Fuses

### Protections and cable sections

kVA	Protections for mains voltages 3x380/220V, 3x400/230V, 3x415/240V				Cable sections recommended by European Standards Alternatively, local standards to be respected			
	Fuses AgL or equivalent MTCB				Cable sections (mm <sup>2</sup> )			
	F1	F2	F3	F4	A	B	C & D & E	K
60	3x100A	3x100A	3x100A	2x160A	3 x 25 + 16	4 x 25	4 x 25 + 16	2 x 50 + 25
80	3x125A	3x125A	3x125A	2x250A	3 x 35 + 25	4 x 35	4 x 35 + 25	2 x 120 + 70
100	3x160A	3x160A	3x160A	2x315A	3 x 50 + 25	4 x 50	4 x 50 + 25	2 x 150 + 95
120	3x200A	3x200A	3x200A	2x355A	3 x 70 + 35	4 x 70	4 x 70 + 35	2 x 185 + 95

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

kVA	A	B	C & D & E	K
60	3 x 35 + 25	4 x 35	4 x 35 + 25	2 x 70 + 35
80	3 x 50 + 25	4 x 50	4 x 50 + 25	2 x 150 + 95
100	3 x 70 + 35	4 x 70	4 x 70 + 35	2 x 185 + 95
120	3 x 95 + 50	4 x 95	4 x 95 + 50	2 x 240 + 120

F1, F2, F3, F4, A, B, C, D, E, (K): supplied by customer

K: supplied by GE only with battery

F4: 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. 4 pole breaker shall not be used at the UPS input (see also IEC 60634, IEC 61140, IEC 61557).