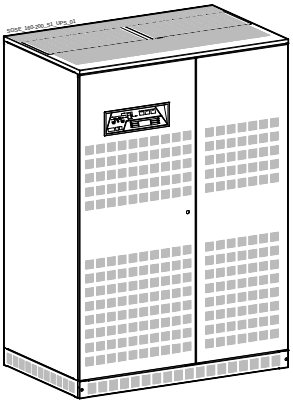
GE Digital Energy
Power Quality

Technical Data Sheets

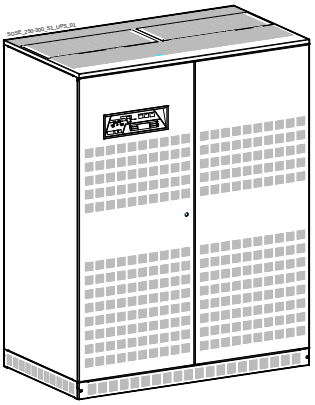
Digital Energy™ Uninterruptible Power Supply

SG-CE Series 160–200–250–300 kVA PurePulse®

400 Vac CE – Series 1



SG-CE Series 160 - 200 kVA PurePulse®



SG-CE Series 250 - 300 kVA PurePulse®

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GE imagination at work

Certified
Quality System
ISO 9001

Model:	***SG-CE Series 160 – 200 – 250 – 300 kVA PurePulse®*** / Series 1
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Up-dating		
Revision	Concern	Date
2.0	ECN 1257 (Short-circuit characteristic)	15.12.2008

GENERAL DATA

Topology	**VFI, double conversion with integrated transformer**				
Nominal output power from PF=0.6 lag. to 0.9 leading	**KVA/kW**	**160/144**	**200/180**	**250/225**	**300/270**
Overall efficiency at 100% load PF=0.9 lag. in VFI mode	**%**	**91.8**	**92.2**	**92.0**	**92.3**
Overall efficiency at 75% load PF=0.9 lag. in VFI mode	(guaranteed	**92.1**	**92.8**	**92.4**	**92.9**
Overall efficiency at 50% load PF=0.9 lag. in VFI mode	values)	**92.1**	**92.9**	**92.7**	**93.2**
Overall efficiency at 100% load in SEM mode	**%**	**98.2**	**98.4**	**98.4**	**98.5**
Heat dissipation at 100% load in VFI mode, PF=0.8 lag. & charged battery	**kW**	**11.44**	**13.54**	**17.40**	**20.02**
Cooling air (25°C ÷ 30°C)	**m³/h**	**3340**	**3950**	**5080**	**5840**
Audible noise level	**dB(A)**	**69**	**69**	**69**	**69**

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 IEC 62040-3)	**1500m: -5% / 2000m: -9% / 2500m: -14% / 3000m: -18%**
Protection degree	**IP 20 (IEC 60529)**
Standards	**IEC 62040, CE marking**
EMC	**IEC 62040-2 (Category C2 as option)**
Electrostatic discharge immunity	**4kV contact / 8kV air discharge**
Internal protection	**All 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	**Front and top access only**
External cable connections	**Bottom at front of the cabinet (top as option)**
Cooling	**Enforced ventilation with fan failure detection**
Paralleling (RPA version)	**Up to 6 units parallelable for redundancy or capacity in RPA configuration (optional).**

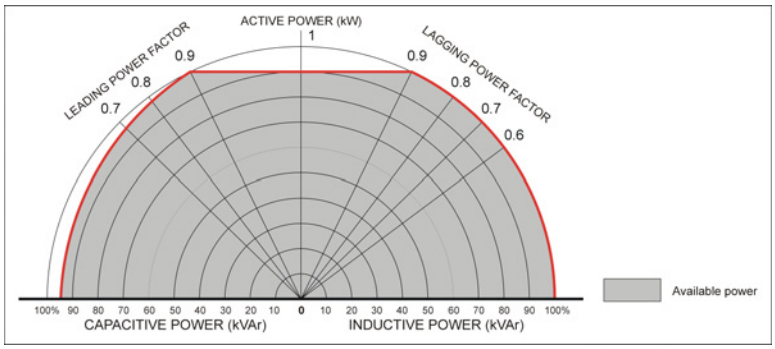
RECTIFIER

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**	**160**	**200**	**250**	**300**
Input power at inverter nominal load and charged battery	at PF=0.8 lag.	**kW**	**139.5**	**173.6**	**217.4**	**260.1**
	at PF=0.9 lag.		**156.9**	**195.3**	**244.6**	**292.6**
Max. input power at inverter nominal load and max. battery recharge current (programmable)		**kW**	**174.8**	**217.2**	**271.4**	**326.6**
Max. battery charging current (programmable) at the beginning of battery recharge at nominal load	at PF=0.8 lag.	**A**	**85**	**105**	**130**	**160**
	at PF=0.9 lag.		**40**	**50**	**70**	**80**

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 NiCd at 1.41V/cell, no boostcharge: 284÷309 cells NiCd at 1.41V/cell, with boostcharge at 1.55 V/cell: 281 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**				
Automatic battery contactor	**Standard**				
Battery power data	**kVA**	**160**	**200**	**250**	**300**
DC power at full load and PF=0.8 lag.	**kW**	**135.2**	**168.3**	**210.8**	**252.1**
DC power at full load and PF=0.9 lag.	**kW**	**152.1**	**189.3**	**237.1**	**283.6**
DC power at full typical computer load (PF=0.66 lag.)	**kW**	**111.5**	**138.8**	**173.9**	**208.0**
Matching battery cabinets	**See optional features on page 4**				

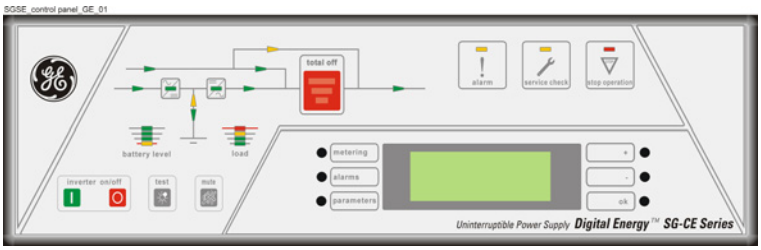
INVERTER	
Nominal output power at PF=0.6 ... 0.9 lag.	**160 – 200 – 250 - 300 kVA**
Nominal output voltage (on site programmable)	**3 x 380V / 400V / 415V + N**
Inverter bridge	**SVM (Space Vector Modulation) and IGBT technology**
Output transformer (for galvanic separation)	**Standard**
Output waveform	**Sine wave**
Output voltage tolerance: - static ..... - dynamic (at load step 0 – 100 – 0%) ..... - dynamic (at load step 0 – 50 – 0%) ..... - recovery time to +/-1% ..... - output voltage THD for 100% linear load ..... - output voltage THD for 100% non-linear load (EN 50091)	 **+/- 1%** **+/- 3%** **+/- 2%** **5 ms** **Max. 1.5%** **Max. 3%**
Output voltage tolerance at 100% unbalanced load (Ph-N)	**+/- 3%**
Output frequency	**50/60 Hz (selectable)**
Output frequency tolerance: - free-running ..... - with mains synchronisation adjustable to	 **+/- 0.1%** **+/- 4%**
Phase displacement: - at 100% balanced load ..... - at 100% unbalanced load	 **120°: +/- 1%** **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.

FRONT PANEL CONTROLS, SIGNALS AND ALARMS



- SYNOPTIC DIAGRAM OF THE UPS: Represents the operational status with integrated LEDs and power flow indicators.
- SERVICE CHECK: Turns on when maintenance is due or when the UPS is "Service mode".
- ALARM: Visual (LED) and audible signal (buzzer), active when an alarm condition is present.
- STOP OPERATION: Visual (LED) and audible signal (buzzer) active approx. 3 minutes before complete and automatic load disconnection (due to an overtemperature condition or fully discharged battery).
- LOAD LEVEL, BATTERY AUTONOMY: Status indicator bar graphs.
- PUSH-BUTTONS:
  - INVERTER ON
  - INVERTER OFF
  - MUTE
  - LAMP TEST
  - TOTAL OFF (key with protective cover): to be pressed for emergency off.
- MONITORING SYSTEM with multi language LCD display and control keys.

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)

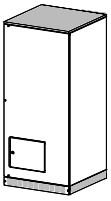
BUILT-IN UPS OPTIONS:

1. RPA kit
2. Auxiliary Power Supply (APS) 24VDC
3. Surge suppressors

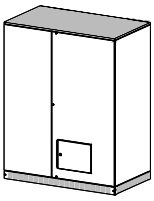
OPTIONS IN ADDITIONAL CABINETS:

Dimensions (WxDxH): ❶ 500x850x1900mm ❷ 850x850x1900mm ❸ 1000x850x1900mm ❹ 1500x850x1900mm

1. Rectifier or bypass or UPS input transformer — ❷ 160 & 200 kVA / ❸ 250 & 300 kVA
2. EMC filter IEC 62040-2 Category C2 (Class A) — ❶
3. Top entry cables cabinet — ❶
4. Special voltages: input and/or output — On request
5. Empty battery cabinets — ❷ ❹
6. Battery cabinet 2x50Ah (without fuses)
7. Battery cabinet 2x75Ah (without fuses)



2x50Ah
❷
1170 Kg



2x75Ah
❹
1800 Kg

BATTERY TABLE

UPS	At 75% load PF 0.8				At 100% load PF 0.8			
	2x50Ah	2x75Ah	4x50Ah	4x75Ah	2x50Ah	2x75Ah	4x50Ah	4x75Ah
160	9 min.	15 min.	22 min.	36 min.	6 min.	11 min.	16 min.	25 min.
200	6 min.	12 min.	17 min.	27 min.	–	8 min.	12 min.	19 min.
250	–	8 min.	13 min.	21 min.	–	6 min.	8 min.	15 min.
300	–	–	10 min.	17 min.	–	–	6 min.	12 min.

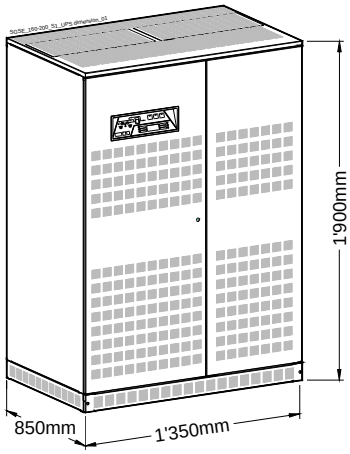
These runtimes can be achieved only with our High Rate batteries

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 160 & 200 kVA

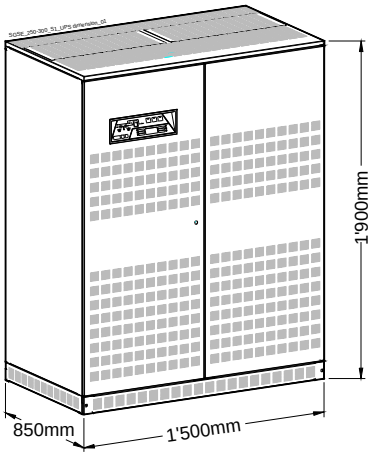


Dimensions (WxDxH):
1350mm x 850mm x 1900mm

WEIGHTS (kg)					
	UPS cabinet		Additional cabinet		
UPS Rating (kVA)	UPS standard (kg)	Floor loading UPS standard (kg/m²)	Rectifier or bypass transformer (850/1000x850x1900mm)	EMC filter IEC 62040-Cat. C2 (500x850x1900mm)	Top entry cables cabinet (500x850x1900mm)
160	1225	1068	800	230	125
200	1315	1146	800	230	125
250	1675	1314	900	230	125
300	1775	1393	900	230	125

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

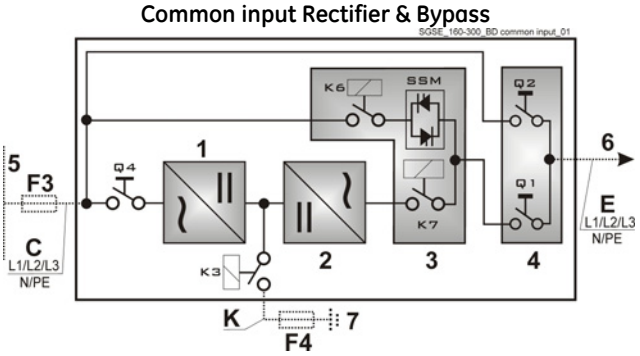
SG-CE Series 250 & 300 kVA



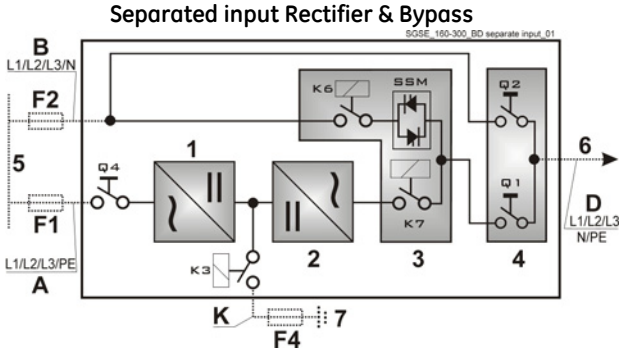
Dimensions (WxDxH):
1500mm x 850mm x 1900mm

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 3x380/220V, 3x400/230V, 3x415/240V					Cable sections recommended by European Standards Alternatively, local standards to be respected			
kVA	Fuses AgL or equivalent MTCB				Cable sections (mm²)			
	F1	F2	F3	F4	A	B	C & E & D	K
160	3x250A	3x250A	3x250A	2x400A	3x120+70	4x120	4x120+70	2x240+120
200	3x315A	3x315A	3x315A	2x500A	3x150+95	4x150	4x150+95	2x(2x120)+120
250	3x400A	3x400A	3x400A	2x630A	3x240+120	4x240	4x240+120	2x(2x150)+150
300	3x500A	3x500A	3x500A	2x800A	3x(2x120)+120	4x(2x120)	4x(2x120)+120	2x(2x240)+240

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*.

Cable sections recommended in Switzerland (mm²)				
kVA	A	B	C & E & D	K
160	3x150+95	4x150	4x150+95	2x(2x95)+95
200	3x185+95	4x185	4x185+95	2x(2x150)+150
250	3x(2x95)+95	4x(2x95)	4x(2x95)+95	2x(2x185)+185
300	3x(2x150)+150	4x(2x150)	4x(2x150)+150	2x(3x185)+2x150

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).