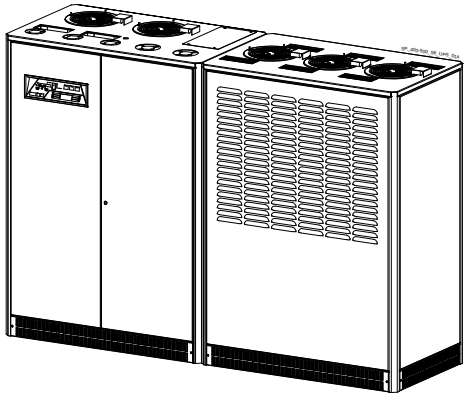
GE Digital Energy
Power Quality

Technical Data Sheets

Digital Energy™ Uninterruptible Power Supply

SitePro 400 & 500 kVA

400 Vac CE – Series 6



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GE imagination at work

CE

Certified
Quality System
ISO 9001

Model:	***SitePro 400 – 500 kVA***, Series 6
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Up-dating		
Revision	Concern	Date
7.0	ECN 1257 (Short-circuit characteristic)	15.12.2008

GENERAL DATA			
Topology	**VFI, double conversion with integrated transformer**		
Nominal output power at PF=0.6 ... 0.9 lag.	**kVA**	**400**	**500**
Overall efficiency in VFI mode	**%**	**Up to 90.1**	
Overall efficiency in SEM mode	**%**	**Up to 98.0**	
Heat dissipation at 100% load in VFI mode, PF=0.8 lag. and charged battery	**kW**	**38.4**	**46.9**
Cooling air (25°C ÷ 30°C)	**m³/h**	**11200**	**13680**
Audible noise level	**dB(A)**	**75**	**75**
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	**-25°C ÷ +55°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 derating Power derating (according to IEC 62040-3)	**1000m** **1500m: -5% / 2000m: -9% / 2500m: -14% / 3000m: -18%**		
Protection degree	**IP 20 (IEC 60529)**		
Standards	**EN 50091 / IEC 62040, CE marking**		
EMC	**EN 50091-2 / IEC 62040-2**		
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	**Cabinet can be floor fixed**		
Access	**Access required at front and rear side of the cabinet**		
External cable connections	**Bottom and top (rear)**		
Cooling	**Forced bottom, front and rear to top by internal blowers**		
Paralleling (RPA version)	**Up to 8 units parallelable for redundancy or capacity in RPA configuration (optional)**		

RECTIFIER				
Rectifier bridge	**12 pulses, fully controlled SCR bridge, overtemperature protected**			
Standard input voltage	**Nominal: 3 x 380V / 400V / 415V + N** **Rectifier accepted ph-ph voltage range: 320V ÷ 460V** **(320V only for 405 VDC battery floating)**			
Other input voltages	**On request**			
Input frequency	**50/60 Hz +/-10% (45 ÷ 66 Hz)**			
Power factor	**>0.8 lag.**			
Inrush current	**Limited by soft-start circuit**			
Power walk-in	**>30 seconds**			
Output voltage tolerance	**+/- 1%**			
DC voltage ripple	**<1%**			
DC current ripple	**Max. 5% of 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**	**400**	**500**
Input power at inverter nominal load and charged battery	at PF=0.8 lag. at PF=0.9 lag.	**kW**	**358.4** **403.1**	**446.9** **502.8**
Max. input power at inverter nominal load and max. battery recharge current (programmable)		**kW**	**445.5**	**555.1**
Max. battery charging current (programmable) at the beginning of battery recharge at nominal load	at PF=0.8 lag. at PF=0.9 lag.	**A**	**215** **106**	**270** **134**

BATTERY			
Battery type	**Valve regulated lead-acid (VRLA)-standard, Vented lead-acid, wet battery and NiCd**		
Number of cells	**180 to 192, placed in external cabinet**		
Float voltage at 20°C	**405 ÷ 436V (dependent on the number of blocks)**		
Min. discharge voltage (programmable)	**1.65V / cell**		
Recharge time	**<5 hours up to 90% of battery capacity**		
"Battery to earth" fault detection	**Standard**		
Automatic and manual battery test	**Standard**		
Battery switch	**Standard**		
Battery power data	**kVA**	**400**	**500**
DC power at full load and PF=0.8 lag.	**kW**	**344.1**	**430.1**
DC power at full load and PF=0.9 lag.	**kW**	**387.1**	**483.9**
DC power at full typical computer load (PF=0.66 lag.)	**kW**	**283.9**	**354.8**
Matching battery cabinets	**See optional features on page 3**		

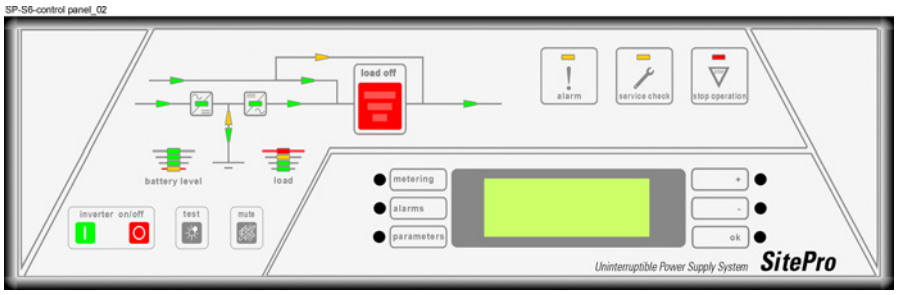
INVERTER	
Nominal output power at PF=0.6 ... 0.9 lag.	**400 – 500 kVA**
Nominal output voltage (on site programmable)	**3 x 380V / 400V / 415V + N**
Inverter bridge	**SVM (Space Vector Modulation) and IGBT technology**
Output transform (for galvanic separation)	**Standard**
Output waveform	**Sine wave**
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%** **20 ms** **<1%** **<2%**
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°: +/- 2%**
Overload capability (at PF=0.8)	**125% - 10 minutes, 150% - 30 secondes**
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)	**400 kVA: fuse 63A AgL or MTCB 125A (magn. trip 10In)** **500 kVA: fuse 80A AgL or MTCB 160A (magn. trip 10In)**
Crest current	**400 kVA - 1600A / 500 kVA - 2000A**
Neutral wiring rating	**2 x Iph**

BYPASS	
Input connection	**Separate (dual input-recommended) or common to the rectifier input**
Primary components	**- Static switch (SCR) on bypass** **- Electromechanic contactors (backfeed protection)** **- 2 manual switches for maintenance bypass**
Voltage limits for inverter/bypass load transfers	**+/- 10% (adjustable)**
Overload on bypass	**200% for 5 minutes and 1000% 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	- **EPO - Emergency Power Off** (n/c contact, customer supplied) - **GEN ON** (emergency power supply ON, n/o contact, customer supplied) - **2 auxiliary signals with settable functionality**
Auxiliary power supply	- **230 VAC single phase outlet (EU type)** - **24 VDC auxiliary power supply (optional)**

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 (LED): turns on when maintenance is due or the manual bypass is active.
- COMMON 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.
- MONITORING SYSTEM with multi language LCD display and control keys.
- Push-buttons:
  - INVERTER ON
  - INVERTER OFF
  - MUTE
  - LAMP TEST
  - LOAD OFF (key with protective cover): to be pressed for emergency load disconnection.

OPTIONS

BUILT-IN UPS OPTIONS:

1. RPA kit
2. 24 VDC Auxiliary Power Supply

COMMUNICATION:

1. Advanced SNMP Card
2. JUMP software suite
3. IRIS service
4. Modbus RTU Interface
5. RMS - Remote Monitoring System (Cable for connection to UPS not included)
6. RSB - Remote Signalling Box (Cable for connection to UPS not included)

OPTIONS IN ADDITIONAL CABINETS:

Dimensions (WxDxH): ❶ 680x800x1800 mm ❷ 1100x800x1800 mm ❸ 1550x800x1800 mm

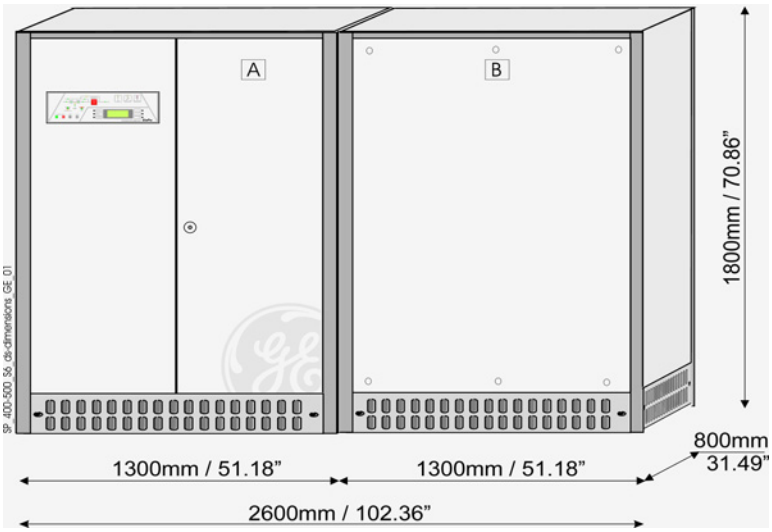
1.	Rectifier transformer	❶ (400 kVA) ❷ (500 kVA)
2.	Bypass transformer	❷
3.	Distortion Control Unit (DCU) with dynamic filtering of 5^{th}, 7^{th}, 11^{th}, 13^{th} harmonics	❷
4.	Distortion Control Unit (DCU) "Light" with filtering of 11^{th} and 13^{th} harmonics	❶
5.	Special voltages: input and/or output	On request
6.	Centralized maintenance bypass for RPA configuration	On request
7.	Empty battery cabinets	❶ ❷ ❸

External accessories:

1.	External battery fuses box	On request

TECHNICAL DATA

SitePro 400 & 500 kVA

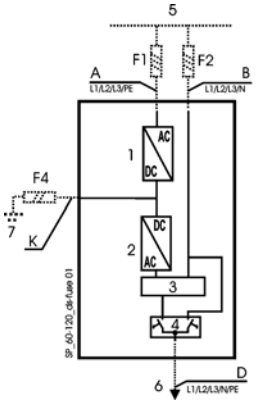


	UPS weight	Floor loading
400 kVA	2750 Kg 1225 (A) + 1525 (B)	1323 Kg/m²
500 kVA	2900 Kg 1300 (A) + 1600 (B)	1400 Kg/m²

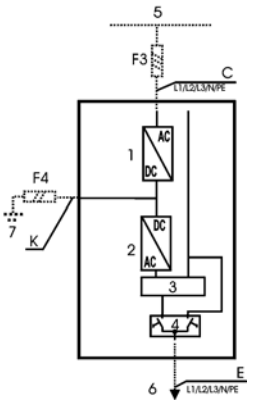
UPS BLOCK DIAGRAM, PROTECTIONS AND CABLE SECTIONS

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

Separated input Rectifier & Bypass (recommended)



Common input Rectifier & Bypass



Protections and cable sections

Protections for mains voltages 3x380/220V, 3x400/230V, 3x415/240V Fuses AgL or equivalent MTCB					Cable sections A, B, C, D, E, K Recommended by European Standards Alternatively, local standards to be respected Cable sections (mm²)				
kVA	**F1**	**F2**	**F3**	**F4** (battery)	**A**	**B**	**C / E**	**D**	**K**
400	3 x 800 A	3 x 630 A	3 x 800 A	2 x 1000 A	3 (2x185) + 185	4 (2 x 150)	4 (2x185) + 185	4 (2x150) + 150	2 (4x120) + 2x120
500	3 x 1000 A	3 x 800 A	3 x 1000 A	2 x 1250 A	3 (3x185) + 2x150	4 (2 x 240)	4 (3x185) + 2x150	4 (2x240) + 240	2 (3x240) + 2x185

F1, F2, F3, A, B, C, D, E: supplied by customer.

F4: can be supplied by *GE*.

SEV/ASE cable sections recommended in Switzerland (mm²)					
kVA	**A**	**B**	**C / E**	**D**	**K**
400	3 (2x240) + 240	4 (2 x 185)	4 (2x240) + 240	4 (2x185) + 185	2 (4x150) + 2x150
500	3 (4x150) + 2x150	4 (3 x 150)	4 (4x150) + 2x150	4 (3x150) + 240	2 (4x185) + 2x185