



SAFEPower Evo

Uninterruptible Power System

SAFEPower Evo is a series of field proven Uninterruptible Power Systems designed to facilitate the requirement for 'HIGH AVAILABILITY' uninterruptible power throughout a wide range of applications.

Power Continuity Solutions for Mission Critical Applications

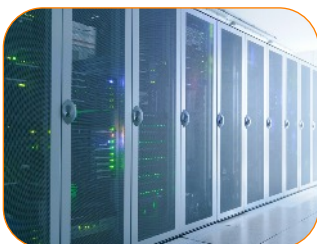


Founded in 1981, SiEL SpA have specialised in the design, development and manufacture of a wide range of Power Protection solutions all of which are employed to ensure the continuity of electrical power to essential equipment and mission critical applications.

Today, SiEL enjoy a reputation as one of Europe's leading manufacturers of 3 phase UPS Systems and in particular high capacity systems of up to 1MVA, single module.

Based on TRUE ON LINE Double Conversion topology – VFI-SS-111 in accordance with EN 50091-3 SAFEPOWER Evo employs proven IGBT based PWM Inverter technology combined with output transformer providing galvanic isolation of the load from the DC circuits and, if required a solid point for referencing the AC output neutral to earth. Systems also demonstrate high levels of short circuit current capability, field proven reliability, robustness, efficiency and flexibility meeting today's demand for 'High Availability' uninterruptible power to a wide range of applications including:

- Data centres.
- Server farms.
- Co-location centres.
- Healthcare facilities.
- Industrial/manufacturing.
- Communications.
- Transportation.

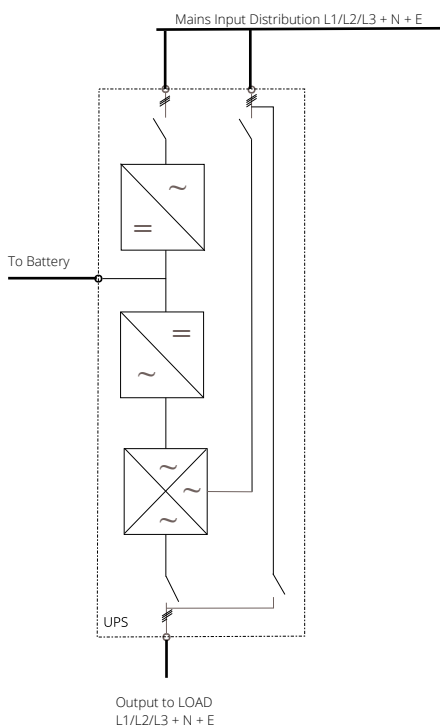




CHARACTERISTICS & FEATURES

SAFEPOWER Evo is characterised by its high performance, high efficiencies and compact dimensions. The output voltage is generated independently of input supply conditions using the latest IGBT PWM power conversion technology and is of a very high quality with a THD of less than 2%. The control maintains stability to within exacting tolerances for both amplitude and frequency even during step load variations.

Standard features of SAFEPOWER Evo include:



- True On Line Double Conversion - VFI-SS-111 in accordance with BS EN 50091-3.
- High efficiencies of up to 94% in On Line mode.
- Inverter Output transformer - galvanic isolation.
- High overload capability.
- High output short circuit current capability.
- Integral fully rated static bypass with high overload capability.
- Integral manual maintenance bypass (single module)
- Equipped with comprehensive LCD for metering and diagnostics together with synoptic diagram.
- Automatic battery testing (programmable).
- Split rectifier - reserve (bypass) input.
- Emergency power off (EPO).

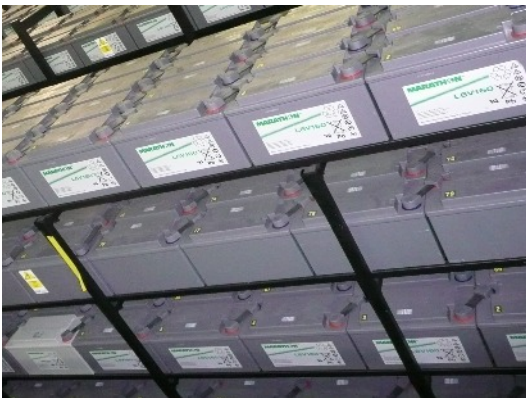
The inclusion of an Inverter OUTPUT TRANSFORMER provides a high level of 'Galvanic Isolation' of the critical load from the DC circuits and, if required a solid point for referencing the system AC output neutral to earth.



OPTIONS

In their standard format SAFEPOWER Evo is a complete and comprehensively equipped system meeting the requirements of a majority of applications and specifications; the availability of a wide range of options ensure that adaptation to the demands of more specific requirements can be readily met.

Range of OPTIONS include;



SAFEPOWER Evo is compatible for use with VRLA, vented lead acid and NiCad batteries.

The generously rated chargers are ideally suited to applications requiring extended battery autonomies.

- Input filters.
- Reserve isolation transformers.
- Input isolation transformers.
- Back feed protection.
- Temperature compensated battery recharging.
- Output voltage remote sensing.
- Digital Remote Alarm Panel.
- Top cable entry.
- Mounting plinths.
- Wide range of battery autonomies.
- External manual bypass systems.
- Various battery mounting options.
- DCB with fused transition for parallel battery strings.
- Remote battery monitoring.
- 50/60 or 60/50Hz frequency conversion.
- ECO operating mode

CONNECTIVITY

SAFEPOWER Evo is equipped as standard with a Customer Interface Board (CIB) providing access to a wide variety of remote communication possibilities including:

- Comprehensive series of N/O & N/C volt free contacts (programmable).
- RS 232.
- Optical.
- DB9 connector.

These interfaces enable direct communication with the system for:

- Complete range of network monitoring and management Software enabling automatic unattended shutdown of servers.
- Local UPS monitoring.
- SNMP.
- TGS (TELEGLOBAL Service) providing remote monitoring 24/7 through our UK service centre.
- ModBus.
- Jbus.



Designed for protection of critical installations, delivering high nine's availability and flexibility.

'DPA' - DECENTRALISED PARALLEL ARCHITECTURE



Up to 5 SAFEPOWER Evo's can be readily configured for parallel operation in order to:-

- Increase system reliability through Redundancy.
- Increase system capacity.

Each module contains it's own static bypass all of which operate in complete coordination to provide high overload levels and uninterrupted transfer between the inverter outputs and mains supply when needed. Furthermore in n+1 applications redundancy is extended to the bypass's increasing the overall fault tolerance of installations.

The design concept is based on modular 'DPA' - Decentralised Parallel Architecture which provides:

Inter bus technology has been designed to enhance system integrity through the elimination of any electrical connections between individual modules, information exchange for synchronisation and correct system operation between intelligent inverter and static switch control logics contained within individual modules is via a secure fibre optic bus.

ENHANCED RELIABILITY - in redundant applications (n+1) a substantial increase in overall system reliability is achieved through the elimination of a single point of failure.

'DPA' eliminates the requirement for a traditional system control cabinet. Individual module outputs are connected direct into a simple distribution panel which can combine input & output distribution, simplify installation and provide an overall system manual maintenance bypass facility.

TOTAL FLEXIBILITY - 'DPA' allows you to optimise capital expenditure through the ability to expand or conversely, scale back capacity as and when required. It also provides numerous possibilities in respect to system architectures to meet the varying demands of individual applications.

Up to 4 systems can be connected to a common battery.

ARCHITECTURES

SAFEPOWER Evo can be readily configured to accommodate various availability levels to suit the critical nature of the application;

1. Single Module

Each module is equipped with:

- Rectifier/charger.
- IGBT PWM inverter.
- Output transformer.
- Fully rated static bypass.
- Integral manual maintenance bypass.
- External battery

2. Hot Standby

Configured for 'HOT STANDBY' the output from one system is connected into the BYPASS input of a second system, hence any transfer of the master unit to bypass still maintains a UPS protected supply to the load.

3. SAFESync

SAFESync operation provides a dual source of synchronised UPS outputs from two independent modules. Synchronisation of the inverter outputs is achieved through intelligent inverter control logics and a secure fibre optic bus connection between them. Inverter outputs are maintained in synchronism even during mains failure conditions.

4. Parallel (DPA)

Up to 5 systems can be connected in parallel for either redundancy and/or capacity. A fibre optic bus between the intelligent inverter and static switch control logics ensure correct system operation. In redundant configurations the redundancy is also extended to the bypass's.

5. DUAL Bus

Certain applications demand a security of supply beyond that provided by any of the foregoing configurations. DUAL Bus systems provide a significant improvement in both availability and maintainability. The inclusion of the 'Group Synchronising Module' (SSE/PBS) ensures the output of two independent power systems are maintained in synchronism. The 1st group will be composed of SAFEPOWER Evo's and the 2nd group can be composed of SAFEPOWER Evo's, 3rd party UPS System, D/Generators or mains supply from a separate source. Security of supply is further enhanced with distribution and downstream 'EXCHANGE' static transfer switches.

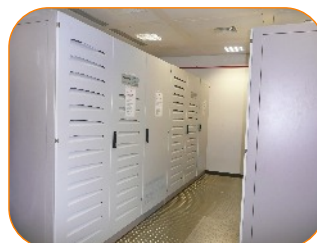
SAFEPOWER Evo - TM

3 phase INPUT/1 phase OUTPUT

MODEL	SPE TM20	SPE TM30	SPE TM40	SPE TM50	SPE TM60
Nominal rating (kVA)	20	30	40	50	60
Topology	ON LINE DOUBLE CONVERSION - VFI-SS-111 WITH INVERTER OUTPUT TRANSFORMER				
Configurations	Single or Parallel for redundancy and/or capacity				
INPUT CHARACTERISTICS					
Voltage (VAC)	380 - 400 - 415				
Phases	3 + N				
Frequency (Hz)	50 or 60Hz				
OUTPUT CHARACTERISTICS					
Nominal power (kVA)	20	30	40	50	60
Active power (kW)	16	24	32	40	48
Nominal voltage (Vac)	220 - 230 - 240				
Phase	1 + N				
Voltage regulation: - Steady state (%) - Dynamic (%)	< ±1 < ± 5 - recovery to within steady state limits <20ms				
Waveform	Sinusoidal				
Distortion (%): - linear load - non-linear load	Typ 1, <2 max <5 (in accordance with EN62040-3)				
Frequency (Hz)	50 or 60				
Frequency regulation: - free running (%) - Sync to mains (%)	± 0.05 ± 1 to ± 4 (selectable)				
Crest factor	3 : 1				
Overload	125% for 10 minutes. 150% for 60 seconds.				
BYPASS					
Integral	Automatic, internal synchronised static and manual maintenance bypass				
BATTERIES					
Type	Valve regulated lead acid (VRLA), flooded lead acid or Nicads.				
Mounting	Externally mounted in cabinets/cladded or open racks.				
COMMUNICATION & MANAGEMENT					
Signalling & alarms	LCD with 2 line, 80 character alphanumeric, multi-coloured status LED indication and audible alarm				
Emergency stop	Yes				
Back-feed protection	Yes - Option				
Communication	Communication interface board with volt-free contacts/RS232/9 pin D and optical.				
PHYSICAL CHARACTERISTICS					
Dimensions* (W x D x H)	550 x 850 x 1055		700 x 860 x 1400		
Weight* (kgs)	270	270	280	300	320
Noise	60dBA @ 1M				
IP rating	IP21				
ENVIRONMENTAL					
Temperature/Humidity	Operating: 0 to +40°C / 20-80% non-condensing (EXCLUDING batteries)				
STANDARDS & COMPLIANCE					
EN62040-1 EMC. EN62040-2 directives 72/73-93/68-2004/108 & EN62040-3					

Due to ongoing product development specifications subject to change without notice.

* EXCLUDES BATTERIES



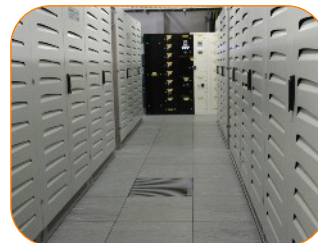
SAFEPOWER Evo - TT

3 phase INPUT/3 phase OUTPUT

MODEL	SPE TT20	SPE TT40	SPE TT60	SPE TT80	SPE TT100	SPE TT120
Nominal rating (kVA)	20	40	60	80	100	120
Topology	ON LINE DOUBLE CONVERSION - VFI-SS-111 WITH INVERTER OUTPUT TRANSFORMER					
Configurations	Single or Parallel for redundancy and/or capacity					
INPUT CHARACTERISTICS						
Voltage (VAC)	380 - 400 -415					
Phases	3 + N					
Frequency (Hz)	50 or 60Hz					
OUTPUT CHARACTERISTICS						
Nominal power (kVA)	20	40	60	80	100	120
Active power (kW)	16	32	48	64	80	96
Nominal voltage (Vac)	380 - 400 - 415					
Phase	3 + N					
Voltage regulation: - Steady state: - Dynamic:	< ±1% < ± 5% - recovery to within steady state limits <20ms					
Waveform	Sinusoidal					
Distortion (%): - linear load - non-linear load	Typ 1, <2 max <5 (in accordance with EN62040-3)					
Frequency (Hz)	50 or 60					
Frequency regulation: - free running (%) - Sync to mains (%)	± 0.05 ± 1 to ± 4 (selectable)					
Crest factor	3 : 1					
Overload	125% for 10 minutes. 150% for 60 seconds.					
BYPASS						
Integral	Automatic, internal synchronised static and manual maintenance bypass					
BATTERIES						
Type	Valve regulated lead acid (VRLA), flooded lead acid or Nicads.					
Mounting	Externally mounted in cabinets/cladded or open racks.					
COMMUNICATION & MANAGEMENT						
Signalling & alarms	LCD with 2 line, 80 character alphanumeric, multi-coloured status LED indication and audible alarm					
Emergency stop	Yes					
Back-feed protection	Yes - Option					
Communication	Communication interface board with volt-free contacts/RS232/9 pin D and optical.					
PHYSICAL CHARACTERISTICS						
Dimensions* (W x D x H)	550 x 850 x 1055			700 x 866 x 1415	700 x 866 x 1415	
Weight* (kgs)	270	310	350	500	680	820
Noise	60dBA @ 1M					
IP rating	IP21					
ENVIRONMENTAL						
Temperature/Humidity	Operating: 0 to +40°C / 20-80% non-condensing (EXCLUDING batteries)					
STANDARDS & COMPLIANCE						
EN62040-1 EMC. EN62040-2 directives 72/73-93/68-2004/108 & EN62040-3						

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* EXCLUDES BATTERIES



SAFEPOWER Evo - TT

3 phase INPUT/3 phase OUTPUT

MODEL	SPE TT160	SPE TT200	SPE TT250	SPE TT300	SPE TT400	SPE TT500	SPE TT600	SPE TT800	SPE TT1000
Nominal rating (kVA)	160	200	250	300	400	500	600	800	1000
Topology	ON LINE DOUBLE CONVERSION - VFI-SS-111 WITH INVERTER OUTPUT TRANSFORMER								
Configurations	Single or Parallel for redundancy and/or capacity								
INPUT CHARACTERISTICS									
Voltage (VAC)	380 - 400 - 415								
Phases	3 + N								
Frequency (Hz)	50 or 60Hz								
OUTPUT CHARACTERISTICS									
Nominal power (kVA)	160	200	250	300	400	500	600	800	1000
Active power (kW) pf-1	144	180	225	270	360	450	540	720	900
Nominal voltage (Vac)	380 - 400 - 415								
Phase	3 + N								
Voltage regulation:	< ±1%								
- Steady state:									
- Dynamic:	< ± 5% - recovery to within steady state limits <20ms								
Waveform	Sinusoidal								
Distortion (%):	Typ 1, <2 max <5 (in accordance with EN62040-3)								
- linear load									
- non-linear load									
Frequency (Hz)	50 or 60								
Frequency regulation:	± 0.05 ± 1 to ± 4 (selectable)								
- free running (%)									
- Sync to mains (%)									
Crest factor	3 : 1								
Overload	125% for 10 minutes. 150% for 60 seconds.								
BYPASS									
Integral	Automatic, internal synchronised static and manual maintenance bypass								
BATTERIES									
Type	Valve regulated lead acid (VRLA), flooded lead acid or Nicads.								
Mounting	Externally mounted in cabinets/cladded or open racks.								
COMMUNICATION & MANAGEMENT									
Signalling & alarms	LCD with 2 line, 80 character alphanumeric, multi-coloured status LED indication and audible alarm								
Emergency stop	Yes								
Back-feed protection	Yes - Option								
Communication	Communication interface board with volt-free contacts/RS232/9 pin D and optical.								
PHYSICAL CHARACTERISTICS									
Dimensions* (W x D x H)	1100 x 820 x 1950			1500 x 1000 x 2000		2700 x 1000 x 2000 (Shipped in 2 x 1350W cabinets)			
Weight* (kgs)	1200	1400	1600	1850	2100	2900	3100	3900	4800
Noise (dBA @ 1M)	63		70			78			
IP rating	IP20								
ENVIRONMENTAL									
Temperature/Humidity	Operating: 0 to +40°C / 20-80% non-condensing (EXCLUDING batteries)								
STANDARDS & COMPLIANCE									
EN62040-1 EMC. EN62040-2 directives 72/73-93/68-2004/108 & EN62040-3									

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*EXCLUDES BATTERIES





- Single phase UPS Systems.
- Centralised Power Systems (CPS).
- Static Transfer Switches.
- Photovoltaic Converters.

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