

Presentation

Innovative protection and high availability for your strategic computer and telecom applications



Galaxy 3000

- ▶ Four power ratings:
10 - 15 - 20 - 30 kVA
- ▶ Three-phase input and output
- ▶ Parallel connection of up to four UPS units, i.e. up to 120 kVA
- ▶ On-line double conversion (VFI)
- ▶ Automatic and manual bypasses
- ▶ PFC system
- ▶ Backup times from 7 minutes up to 8 hours with CLA long-time battery charger
- ▶ Sealed or vented lead-acid batteries, with service lives of 5 or 10 years

Fig 4.19. Galaxy 3000 range.

Applications

Galaxy 3000 is designed to meet the needs in terms of high availability and flexibility of sensitive equipment such as:

- ▶ computer rooms,
- ▶ internet (Internet Data Centres),
- ▶ telecom equipment,
- ▶ industrial processes, emergency lighting, laboratories.

Colour

Four colours are available:

- ▶ light grey,
- ▶ metal grey,
- ▶ metal blue,
- ▶ metal green.

For other colours, please consult us.

Main features

Maximum flexibility

Galaxy 3000 offers maximum flexibility to meet all needs.

- ▶ Backup times from 7 minutes up to 8 hours provided by batteries with 5-year or 10-year service lives.
- ▶ Modular design for easy upgrades, such as increased power ratings or improved availability:
 - > parallel connection of up to four UPS units,
 - > hot-standby configurations,
 - > source redundancy with the Galaxy STS (static transfer switch).
- ▶ Wide input-voltage window extending down to 37% of the rated voltage for improved compatibility and fewer transfers to battery power.

Power Factor Correction (PFC) system for clean power

Galaxy 3000 ensures clean power through the PFC system that eliminates electrical disturbances on the upstream system and supplies downstream a power waveform offering exceptional quality.

This system implements a clean, high-performance IGBT rectifier/charger offering, without any further filtering:

- ▶ clean input current, with a sinusoidal waveform in phase with the voltage, thus eliminating harmonic disturbances (THDI < 3%),
- ▶ a high power factor (FP > 0.99),
- ▶ total compatibility with engine generator sets,
- ▶ a reduction in installation electrical consumption of up to 20%.

A comprehensive view of communication

Many possibilities for communication with the electrical and computer environments:

- ▶ Multi-lingual graphic display (15 languages including Chinese) providing clear information on measurements, diagnostics and alarms, with mimic diagrams.
- ▶ Programmable relay card.
- ▶ 3 communication ports for installation of additional cards:
 - > RS232/U-Talk or Jbus/Modbus,
 - > RS485 Jbus/Modbus,
 - > SNMP/Ethernet,
 - > RS232 HID,
 - > USB/HID,
 - > XML-Web (HTTP),
 - > 6 relay contacts 250 V 2 A,
 - > dry contacts and/or remote shutdown.
- ▶ Terminal block for reception of an emergency power off (EPO) signal.
- ▶ LED remote-indications unit.
- ▶ MultiSlot expansion module (optional), which may be used as a data concentrator in redundant or parallel UPS systems.
- ▶ Compatibility with different software packages:
 - > Monitor-Pac, for management and supervision of the various MGE UPS SYSTEMS equipment,
 - > Solution-Pac, for UPS management with automatic shutdown of system files prior to the end of battery backup time,
 - > UPS Web-Pac, for UPS management via the web, with automatic shutdown of system files prior to the end of battery backup time,
 - > Management-Pac, for management and supervision of UPSs by a network administrator.



Fig 4.20: Graphic display



Fig 4.21: Communication with Solution-Pac

Battery Monitor for advanced battery management

The Galaxy 3000 Battery Monitor optimises the battery service life and continuously maintains a high degree of battery availability through the functions listed below:

- ▶ Intermittent charge cycle designed to prolong battery service life (fig. 4.22).
- ▶ Automatic detection of battery parameters, which are initialised during the first charge cycle and then automatically updated.
- ▶ Increased battery service life by taking into account the manufacturer parameters, with adaptation of the charge voltage to ambient temperature changes.
- ▶ Precise measurement of the true backup time depending on the age of the battery, the room temperature and the percent load on the UPS.
- ▶ Calculation of the remaining battery service life.
- ▶ Battery protection against deep discharge.
- ▶ Backfeed protection (optional) to protect users from the flow of power upstream toward the distribution system during operation on battery power.
- ▶ Limitation of the charge current (0.05 C10 to 0.1 C10).
- ▶ Numerous automatic tests.

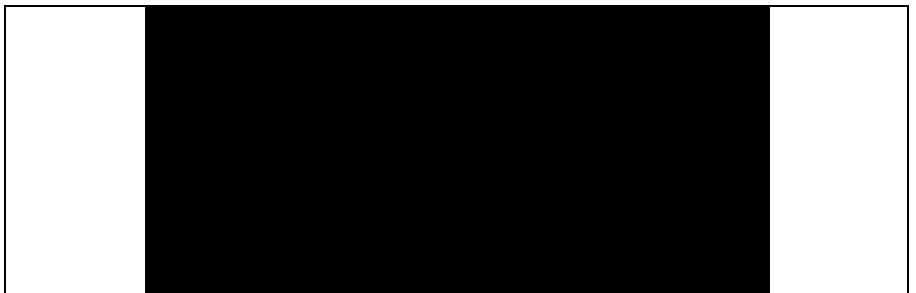


Fig 4.22. Intermittent battery recharge.

High availability

- ▶ On-line double-conversion technology (VFI as per IEC 62040-3/EN 50091), that completely regenerates the power signal and the frequency, and guarantees constant power quality whatever the conditions on the distribution system.
- ▶ Automatic bypass for no-break transfers of the load to the bypass AC input if an internal anomaly occurs (fault tolerant).
- ▶ Hot-swap function for servicing on the UPS and replacement of communication cards and battery modules without interrupting the supply of power to the applications.
- ▶ Cold-start function for start-up of applications on battery power even during a utility power outage.
- ▶ Long backup-time charger (optional) for backup times longer than 30 minutes, offering a reduced charge time (8 to 10 hours for 80% of the rated backup time).
- ▶ Redundancy with up to four parallel-connected UPS units to protect high-availability servers.

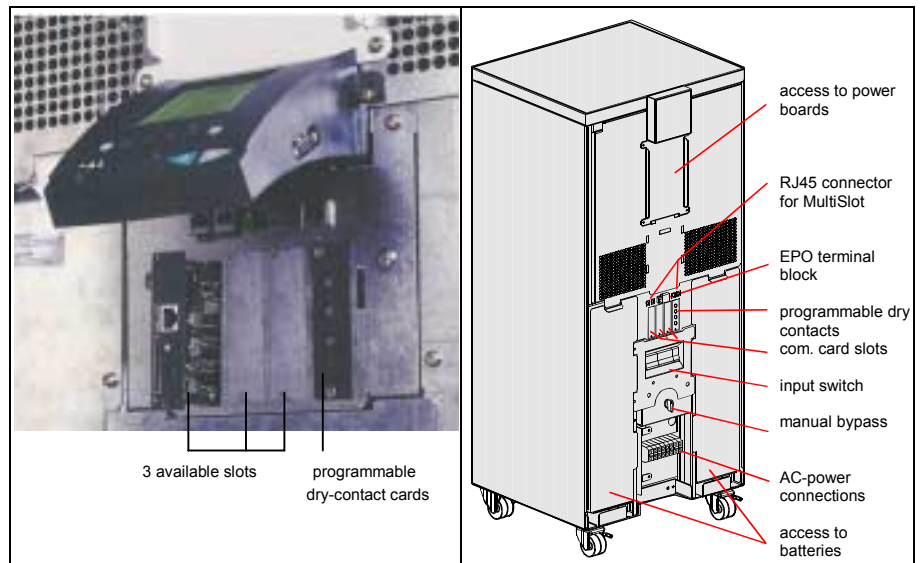


Fig 4.23. Hot swap of a communication card.

Fig 4.24. Total accessibility through the front.

Innovative design that is both tasteful and functional

- ▶ Easy integration in the environment:
 - > tasteful design with four colours available,
 - > low noise level.
- ▶ Reduced footprint.
- ▶ Cable entry through the bottom.
- ▶ Easy handling with a forklift.
- ▶ Easy access to all functions through the front:
 - > power boards,
 - > communication cards (can be hot swapped),
 - > battery (can be hot swapped),
 - > connections.

Advanced design

- ▶ Innovative technology employing "six-pack" IGBTs offering:
 - > high performance (high chopping frequency),
 - > simplified design for greater reliability,
 - > compactness for even better access.
- ▶ Liquid cooling system for optimised operation of the power components (temperature at junctions 90° C instead of 120° C).
- ▶ Maximum electromagnetic compatibility, level B.
- ▶ ECO mode for automatic shifts to energy-saving mode depending on the quality of the AC-input power.
- ▶ Certified quality in manufacturing (ISO9001) and for the environment (ISO14001).

Diagram and functions

Galaxy 3000 single UPS units offer the following equipment and functions:

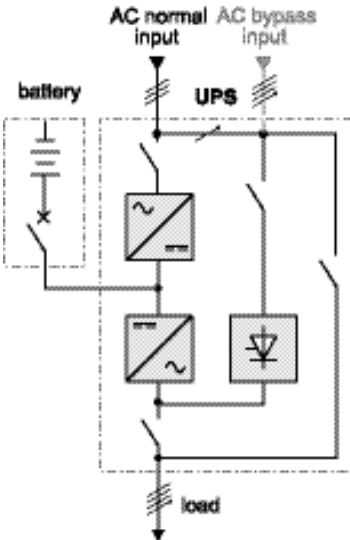
	Standard ▶ PFC three-phase rectifier/charger ▶ Three-phase inverter ▶ Automatic bypass (static switch) ▶ Manual maintenance bypass ▶ Graphic display with 15 languages, animated mimic panels, event time-stamping, a personalisation menu and a password ▶ Programmable relay card with 8 dry contacts ▶ Three communication ports ▶ Functions: > Battery Monitor function with automatic detection and updating of battery parameters and measurement of the true backup time > ECO mode > hot-swap function for the replacement and maintenance of batteries and communication cards ▶ Four colours available ▶ EMC compatibility level B Optional ▶ Functions: > cold start on battery power > backfeed function to protect the distribution system from battery faults ▶ Battery-Supervisor ▶ CLA long-time battery charger ▶ MultiSlot ▶ Communication cards: > RS232/U-Talk or JBus/Modbus > RS485 Jbus/Modbus > SNMP/Ethernet > RS232 HID > USB/HID > XML-Web (HTTP) > 6 relay contacts 250 V 2 A > dry contacts and/or remote shutdown ▶ eparate Normal and Bypass AC inputs ▶ Software: > Monitor-Pac > Solution-Pac > UPS Web-Pac > Management-Pac

Fig 4.25. Single UPS unit.

Galaxy 3000™ UPSs (cont.)

Electrical characteristics and communication

Power rating (kVA at PF= 0.8) (rated apparent output power)		10	15	20	30
Active power (kW)		8	12	16	24
Input (rated values and tolerances where applicable)					
Number of phases		3 + N			
Voltage	Normal AC input	380 / 400 / 415 V ± 10 % and range from 250 V (323 V at Pn) to 440 V ⁽¹⁾			
	Bypass AC input	380 / 400 / 415 V ± 10 % and range from 250 V (323 V at Pn) to 440 V			
Frequency		47 to 63 Hz			
THDI ⁽²⁾		< 3 %			
Currents		See the "input and output currents" table below			
Power factor		0.99			
Output (rated values and tolerances where applicable)					
Number of phases		3 + N			
Voltage		380 / 400 / 415 V ± 1 %,			
Frequency	AC power sync	50 or 60 Hz ± 1 % (adjustable from 1 to 4 %)			
	free running	± 0.1 %			
Power factor		linear load 0.8			
THDU ⁽³⁾	linear load	≤ 2 % ph/N			
	reference non-linear load	≤ 3 % ph/N			
Currents		See the "input and output currents" table below			
Short-circuit capacity (without bypass) (A)		2.7 In 150 ms			
Bypass short-circuit capacity		10 In 20 ms			
Overload capacity		120 % for 1.5 min. - 150 % for 1s			
Crest factor		up to 3 :1			
Voltage transients during load step changes		± 3 % on 0 to 100% or 100 to 0% load step changes recovery time < 20 ms for linear loads and < 50 ms for non-linear loads			
Voltage and phase imbalance		1.5 % and 2 degrees for 50% current imbalance			
Maximum frequency variation		1 Hz/s or 2 Hz/s			
Efficiency					
Percent load	100 %	89 %	89 %	89 %	89 %
	50 %	87 %	88 %	87 %	88 %
In ECO mode	100 %	97 %	97 %	97 %	97 %
	50 %	95 %	96 %	95 %	96 %
Conditions for transfer to AC bypass					
Acceptable difference in voltage		+ 10 %, - 12%			
Synchronisation frequency range		± 0.5 Hz to ± 2 Hz			
Maximum phase shift		3 degrees			
Battery					
Type		Sealed lead-acid			
Service life		5 or 10 years			
Backup time / 5 yr	built-in battery	10 to 17 min.	10 min.	10 to 15 min.	9 min.
	1 battery cabinet	28 to 60 min.	15 to 30 min.	28 min.	15 to 30 min.
	2 battery cabinets	120 min.	60 min.	60 min.	60 min.
Backup time / 10 yr	built-in battery	10 to 17 min.	10 min.	10 to 15 min.	9 min.
	1 battery cabinet	28 to 60 min.	15 to 30 min.	28 min.	15 to 30 min.
	2 battery cabinets	120 min.	60 min.	60 min.	60 min.
Communication					
Standard		programmable relay card with 8 dry contacts 3 slots for communication cards			
Options		MultiSlot for 3 additional ports 2-port RS232/U-Talk or Basic (dry contacts) card (user choice) RS 232 or RS485 Jbus/Modbus card 10BT SNMP card 2-port RS232 card (HID protocol) 1-port USB card (HID protocol) 1-port XML-Web card (HTTP) 2-port dry contact and/or remote shutdown card card with 6 relay contacts (250 V 2 A)			

(1) Option with 460 or 480 V transformer and common Normal and Bypass AC input source

(2) THDI (Total Harmonic Distortion - I for current)

(3) THDU (Total Harmonic Distortion - U for voltage)

Galaxy 3000™ UPSs (cont.)

Physical characteristics, environment and standards

Power rating (KVA at PF= 0.8) (rated apparent output power)		10	15	20	30
Active power (kW)		8	12	16	24
Dimensions and weight of UPS					
Height (mm)		655		670	
Width (mm)		1420		1600	
Depth (mm)		565		685	
Net weight (kg)	without battery	210		240	
	5 yr/10 min. battery	330	380	470	580
	10 yr battery	380 (12 min.)	380 (7 min.)	570 (12 min.)	570 (7min.)
Dimensions and weight armoire batteries					
Height (mm)		650		850	
Width (mm)		1420		1600	
Depth (mm)		565		685	
Net weight (kg)	without battery	110		160	
	5 yr battery	330	380	470	580
	10 yr battery	380 (12 min.)	380 (7 min.)	570 (12 min.)	570 (7min.)
Environment					
Noise level (dBA)		< 50	< 50	< 53	< 53
Heat losses (kW)		1.1	1.56	2.1	3
Degree of protection (as per IEC 529)		IP215			
Maximum altitude without derating		≤ 1000 m			
Temperature range for storage	without battery	- 25°C to + 70°C dry heat			
	with battery	- 10°C to + 45°C			
Temperature range for operation	inverter	at full rated load, PF = 0.8: 0 to 40°C mean daily (40°C for 8 hours, 35°C for 24 hours), 20 to 25°C recommended, for overload conditions, PF = 0.8: 0 to 30°C continuous			
	battery	possible: 0 to 40°C (40°C for 8 hours, 35°C for 24 hours) optimum: + 15°C to + 25°C (service life is reduced by half for every 10° above 25°C)			
Standards					
Construction and safety		IEC 62040-1 / IEC 60950 / EN 50091-1			
Performance and topology		IEC 62040-3 / EN 50091-3			
EMC		IEC 62040-2 / EN 50091-2 level B / EN 55011 and EN 55022 level B / FCC part 15			
Harmonics		IEC 61003-2 / IEC 61003-4			
Design and manufacture		ISO14001 / ISO 9001			
Certification and marking		TüV / CE			

Galaxy 3000™ UPSs (cont.)

Currents and protection characteristics

Power rating (KVA at PF= 0.8) (rated apparent output power)	10	15	20	30
Active power (kW)	8	12	16	24

Input and output currents

Currents and measurement conditions

Currents and measurement conditions

N.B. These currents are measured for:
 - full rated load for PF = 0.8;
 - a rated Normal AC input voltage of 400 V;
 - battery float charging.
 For rated Normal AC input voltages of 380 V and 415 V, multiply the indicated I1 and Iu values by 1.05 and 0.96 respectively.

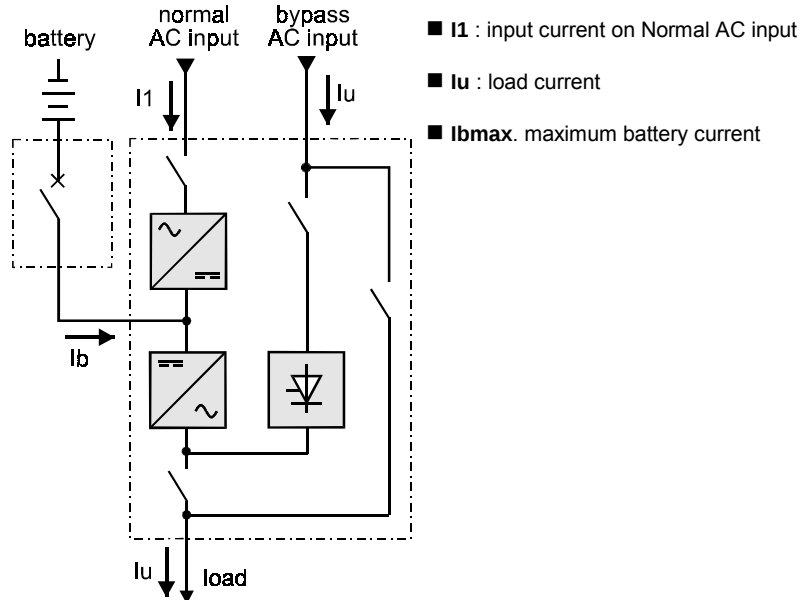


Fig 4.26 : currents

Max. input current I1 (A)

common Normal and Bypass AC input (operating current on bypass I1 = Iu)	15	22	29	44
separate Normal and Bypass AC inputs (current with battery charging)	14	21	28	42
Load current Iu (A)	15	22	29	44
Max. battery output current Ibmax (A)	39	58	78	116

Upstream protection ⁽¹⁾ by Schneider Electric circuit breakers recommended

Common Normal and Bypass AC input

Normal AC (4-ph)	type	C60H 40A 4P	NC100H 80A 4P
	trip unit	curve C	curve D

Separate Normal and Bypass AC inputs

Normal AC (3-ph)	type	C60H 40A 3P	NC100H 80A 3P
	trip unit	curve C	curve D
Bypass AC (4-ph)	type	C60H 40A 4P	NC100H 80A 4P
	trip unit	curve C	curve D

Spectrum of the current reinjected upstream

Harmonic spectrum of current I1	Harmonic components in I1	Individual harmonics
Maximum values, without filtering, measured directly at UPS input for PF = 0.8. The indicated values are for a 30 kVA UPS at 100% load. The actual values will depend on the impedance of the power source and the upstream cables.	H2	0.22
	H3	1.02
	H4	0.03
	H5	2.07
	H7	0.25
	H8	0.07
	H11	0.38
	H13	0.34
	H17	0.50
	THDI ⁽¹⁾	2.63%

(1) The protection information below is provided only as a general indication for single UPS units supplied by a 400 V, 50 to 60 Hz Normal AC source.

Always check that the protection used complies with local standards and the specific features of the electrical installation including:

- ▶ withstand capacity with respect to the short-circuit current at the point of installation
- ▶ the maximum permissible current that the static switch semi-conductors can withstand
- ▶ discrimination with respect to UPS output protection when operating on the bypass.

(2) Total Harmonic Distortion - I for current.