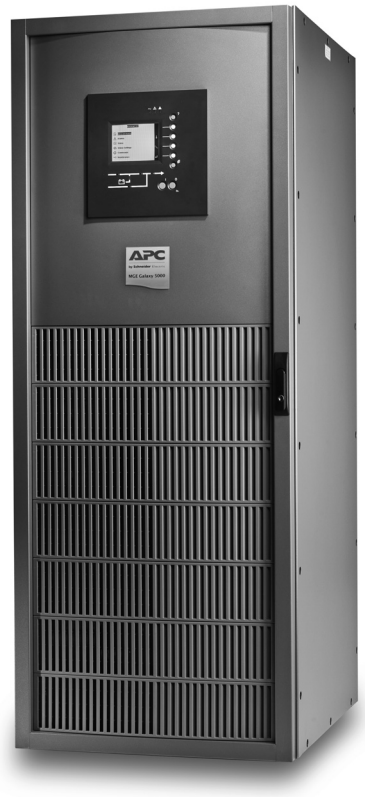
www.mgeups.com

MGE Galaxy 5000

40 – 130KVA

Installation and User Manual



Critical Power and Cooling Services Division

APC®

by Schneider Electric

MGE Galaxy 5000

40 – 130KVA

Uninterruptible Power Systems

Installation and User Manual

Schneider Electric
1660 Scenic Avenue, Costa Mesa, CA 92626, (714) 557-1636
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APC by Schneider Electric

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS – This manual contains important instructions for Galaxy 5000 that must be followed during operation and maintenance of the equipment.

WARNING **Opening enclosures expose hazardous voltages. Always refer service to qualified personnel only.**

ATTENTION **L'ouverture des cellules expose à des tensions dangereuses. Assurez-vous toujours que le service ne soit fait que par des personnes qualifiees.**

WARNUNG! **Das öffnen der Gehäuse legen gefährliche Spannungen bloss. Service sollte immer nur von qualifizierten Personal durchgeführt werden.**

WARNING **As standards, specifications, and designs are subject to change, please ask for confirmation of the information given in this publication.**

ATTENTION **Comme les normes, spécifications et produits peuvent changer, veuillez demander confirmation des informations contenues dans cette publication.**

WARNUNG! **Normen, Spezifizierungen und Pläne unterliegen Anderungen. Bitte verlangen Sie eine Bestätigung über alle Informationen, die in dieser Ausgabe gemacht wurden.**

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at user's own expense.

WARNING

To reduce the risk of fire or electric shock, install in a controlled indoor environment free of conductive contaminants.

This equipment is intended only for installations in a RESTRICTED ACCESS LOCATION.

ATTENTION **Pour réduire le riske d'inccendie ou d'électrocution, installer dans une enciente intérieure contrôlée en température et humidité et sans contaminants conducteurs.**

Ce matériel est destiné seulement pour des installations dans un EMPLACEMENT RESTREINT D'ACCES.

WARNUNG! **Um die Gefahr von Feuer und elektrischem Schock zu reduzieren, muss das Gerät in einem temperatur – und feuchtigkeitskontrollierten Raum, frei von leitungsfähigen Verunreinigungen, installiert werden. Dieses Gerät ist nur für die Installation an einem Ort mit qeingeschränkter Zugangserlaubnis vorgesehen.**

Diese Ausrüstung ist nur für Anlagen in einem EINGESCHRäNKTEN ZUGRIFF STANDORT bestimmti.

WARNING **HIGH LEAKAGE CURRENT. Ground connection essential before connecting supply.**

ATTENTION **COURANT DE FUITE ELEVE. Raccordement a la terre indispensable avant le raccordement au reseau.**

WARNUNG! **Hoher Ableitstrom Vor Inbetriebnahme Schutzleiterverbindung herstellen.**

Certification Standards – Three Phase UPS

- IEC1004/ANSI C62.41 Standards for Surge Withstand Ability.
- FCC Part 15, Subpart J, Class A.
- UL/CUL 1778, Standards for Uninterruptible Power Supply Equipment.
- NEMA PE 1 - Uninterruptible Power Systems.
- NFPA 70 – National Electrical Code.
- ISO 9001.

Environment

This product has been designed to respect the environment. It does not contain any Chlorofluorocarbon (CFC) or Hydrochlorofluorocarbon (HCFC).

UPS recycling at the end of service life: Schneider Electric undertakes to recycle, by certified companies and in compliance with all applicable regulations, all UPS products recovered at the end of their service life (contact your Schneider Electric branch office).

Packing: UPS packing materials must be recycled in compliance with all applicable regulations.

WARNING: This product may be supplied with lead-acid batteries. Lead is a dangerous substance for the environment if it is not properly recycled by specialized companies.

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CAUTION: Record All Serial Numbers!

RECORD ALL SERIAL NUMBERS FOR THE MGE GALAXY 5000 AND ACCESSORIES.
THESE SERIAL NUMBERS WILL BE REQUIRED IF YOUR SYSTEM NEEDS SERVICE.
KEEP THIS MANUAL IN A PLACE WHERE YOU CAN REFERENCE THE SERIAL NUMBERS IF SERVICE IS REQUIRED!

UPS SERIAL NUMBER: _____

BATTERY SERIAL NUMBER: _____

AUXILIARY SERIAL NUMBER: _____

ADDITIONAL SERIAL NUMBERS:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

NOTES:

Safety Rules

Safety of persons

The UPS must be installed in a room with restricted access (qualified personnel only). A UPS has its own external power source (the battery). Consequently, the power outlets may be energized even if the UPS is disconnected from the AC-power source.

Dangerous voltage levels are present within the UPS. It should be opened exclusively by qualified service personnel.
The UPS must be properly grounded.
The battery supplied with the UPS contains small amounts of toxic materials.
To avoid accidents, the instructions below must be observed.
◗ Never operate the UPS if the ambient temperature and relative humidity are higher than the levels specified in the documentation.
◗ Never burn the battery (risk of explosion).
◗ Do not attempt to open the battery (the electrolyte is dangerous for the eyes and skin).
◗ Comply with all applicable regulations for the disposal of the battery.
◗ Caution, wait five minutes before opening the UPS to allow the capacitors to discharge.
◗ Caution, there is high leakage current, the grounding conductor must be connected first.
◗ The product must be installed on a non-inflammable surface (e.g. concrete).
◗ Caution, battery replacement must be carried out by qualified personnel.

Product safety

A protection circuit breaker must be installed upstream and downstream, and be easily accessible.
◗ Never install the UPS near liquids or in an excessively damp environment.
◗ Never let a liquid or foreign body penetrate inside the UPS.
◗ Never block the ventilation grates of the UPS.
◗ Never expose the UPS to direct sunlight or a source of heat.
◗ When replacing battery cells, use the same type and number of cells.

Special precautions

◗ The UPS connection instructions contained in this manual must be followed in the indicated order.
◗ Check that the indications on the rating plate correspond to your AC-power system and to the actual electrical consumption of all the equipment to be connected to the UPS.
◗ If the UPS must be stored prior to installation, storage must be in a dry place.
◗ The admissible storage temperature range is -25°C to +45°C.
◗ If the UPS remains de-energized for a long period, we recommend that you energize the UPS for a period of 24 hours, at least every three months. This charges the battery, thus avoiding possible irreversible damage.
◗ The UPS is designed for normal climatic and environmental operating conditions concerning the altitude, ambient operating temperature, relative humidity and ambient transport and storage conditions.
◗ Using the UPS within the given limits guarantees its operation, but may affect the service life of certain components, particularly that of the battery and its autonomy. The maximum storage time of the UPS is limited due to the need to recharge the battery.
◗ Unusual operating conditions may justify special design or protection measures:
- harmful smoke, dust, abrasive dust,
- humidity, vapor, salt air, bad weather or dripping,
- explosive dust and gas mixture,
- extreme temperature variations,
- bad ventilation,
- conductive or radiant heat from other sources,
- strong electromagnetic fields,
- radioactive levels higher than those of the natural environment,
- fungus, insects, vermin, etc.,
- battery operating conditions.

Symbol Usage

Document Icons


Danger, these instructions are imperative.


Information, advice, help

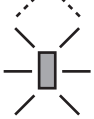

Visual indication


Action


Audio signal


LED OFF


LED flashing


LED ON


Ground cables


Other cables

Display Icons


Vertical selection


Other selection


Enter / Confirm


Event scroll in log


Page scroll in log


Fast forward


Forward


Details


Circular menu


Graphical display

Return to previous display

Delete

Access to measurements


Buzzer off


Move up or down one page

Event selection in log by date and time


Increase

Decrease


Save


Alarm

Status conditions


Settings


Maintenance


Control

Section Descriptions

1 Introduction

Provides a general description of the MGE Galaxy 5000 system's intended use, single line, major components, and mechanical specifications.

2 Setup and Installation

Guides the user through performing connections required for initial installation. Included are the electrical specifications and connection details.

3 Operation

Provides startup, shutdown, and normal operation of the MGE Galaxy 5000 UPS. Describes the operation of the mimic-panel LEDs.

4 Maintenance

Identifies alarm conditions, UPS isolation operation, and maintenance and safety information on servicing batteries for the MGE Galaxy 5000.

A **Glossary** provides definitions of abbreviations and terms used in this manual.

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Thank you for selecting a Schneider Electric product to protect your electrical equipment. The MGE Galaxy 5000 range has been designed with the utmost care. We recommend that you take the time to read this manual to take full advantage of the many features of your UPS. Schneider Electric pays great attention to the environmental impact of its products. Measures that have made MGE Galaxy 5000 a reference in environmental protection include:

- the eco-design approach used in product development,
- production in an ISO 14001 certified factory,
- recycling of the MGE Galaxy 5000 at the end of its service life.

To discover the entire range of Schneider Electric products and the options available for the MGE Galaxy 5000 range, we invite you to visit our web site, www.mgeups.com, or contact your local Schneider Electric representative.

All products in the MGE Galaxy 5000 range are protected by patents. They implement original technology not available to competitors of Schneider Electric.

To take into account evolving standards and technology, equipment may be modified without notice. Indications concerning technical characteristics and dimensions are not binding unless confirmed by Schneider Electric.

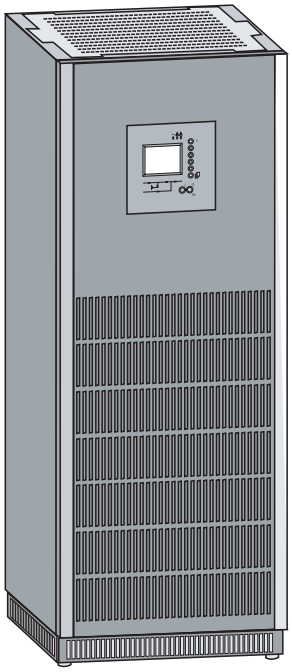
1.0 Scope

Provides a general description of the MGE Galaxy 5000 system's intended use, single line major components, and mechanical specifications.

1.1 General Description

The MGE Galaxy 5000 is a three phase double conversion uninterruptible power supply (UPS), designed for flexibility to meet a wide range of application requirements. The MGE Galaxy 5000 offers many options to allow you to customize a solution to meet your unique specifications. The options offered include, but are not limited to, adjacent and remote battery cabinets, input and output isolation transformers, distribution options, parallel system bypass cabinets, and a variety of communication cards.

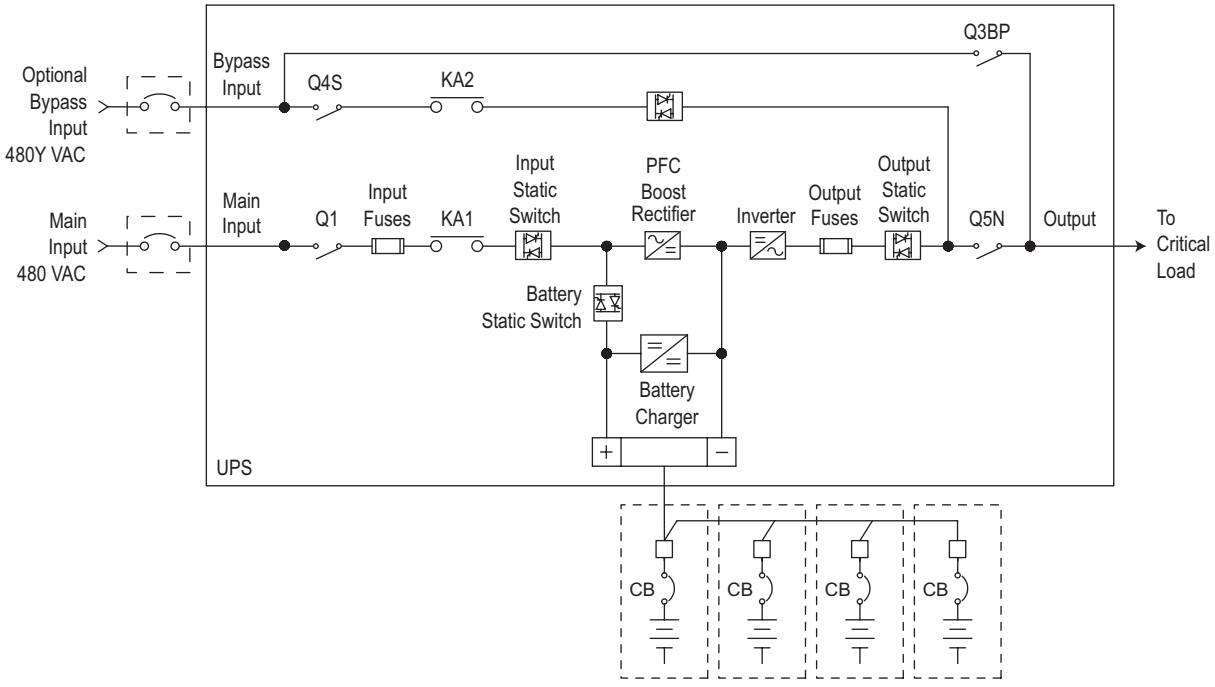
Figure 1-1: MGE Galaxy 5000 UPS Cabinet.



UPS power rating (KVA)	Dimensions (H x W x D)
40-130	75” x 28” x 33.4” 1900 x 712 x 850 mm

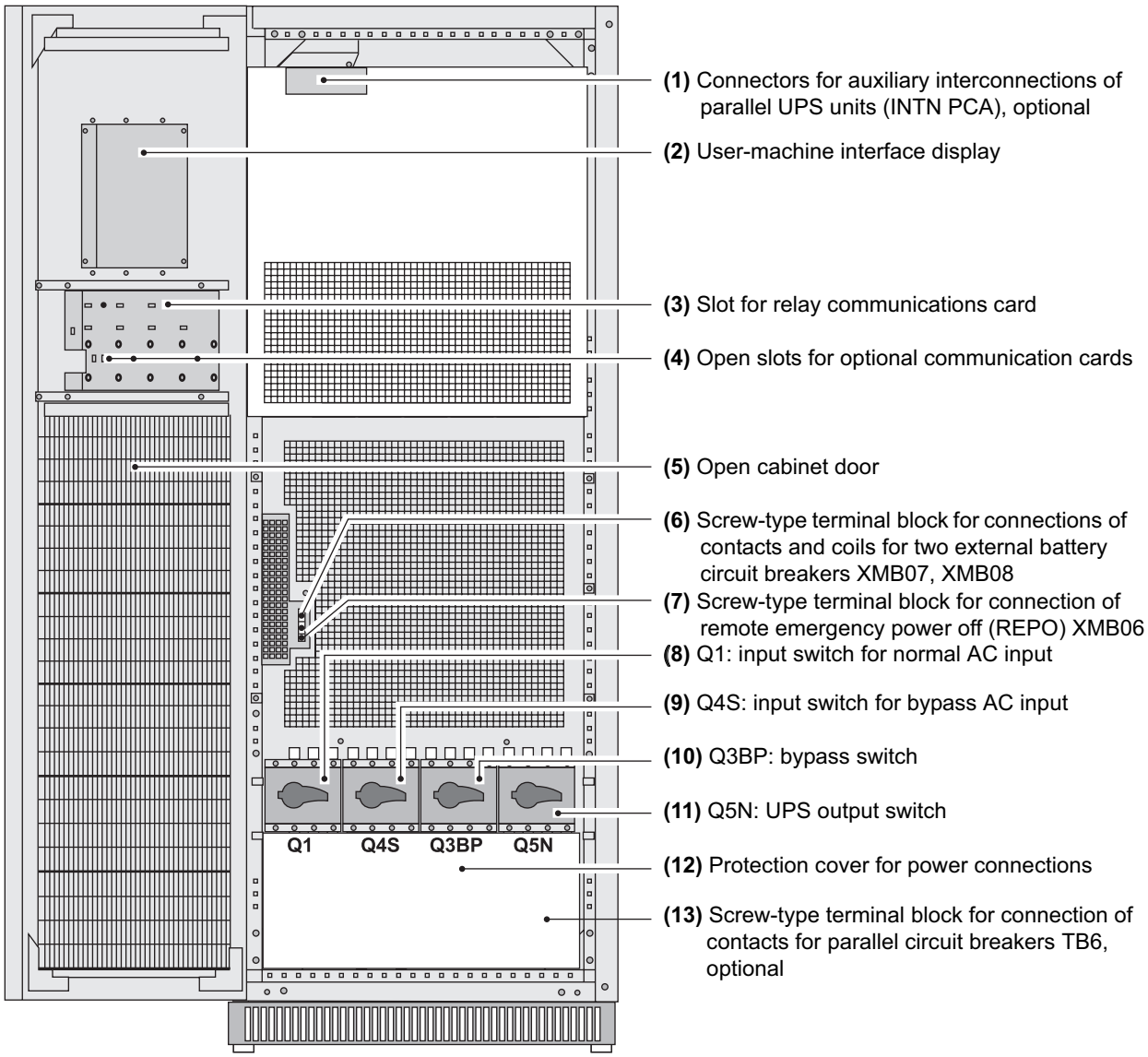
Figure 1-2: Single Line Diagram

MGE GALAXY 5000 UPS SYSTEM WITH BATTERY SINGLE LINE DIAGRAM



1.2 Inside the UPS Cabinet, Access to Connections

Figure 1-3: Inside MGE Galaxy 5000 UPS Cabinet



(1) Connectors for auxiliary interconnections of parallel UPS units (INTN PCA), optional

(2) User-machine interface display

(3) Slot for relay communications card

(4) Open slots for optional communication cards

(5) Open cabinet door

(6) Screw-type terminal block for connections of contacts and coils for two external battery circuit breakers XMB07, XMB08

(7) Screw-type terminal block for connection of remote emergency power off (REPO) XMB06

(8) Q1: input switch for normal AC input

(9) Q4S: input switch for bypass AC input

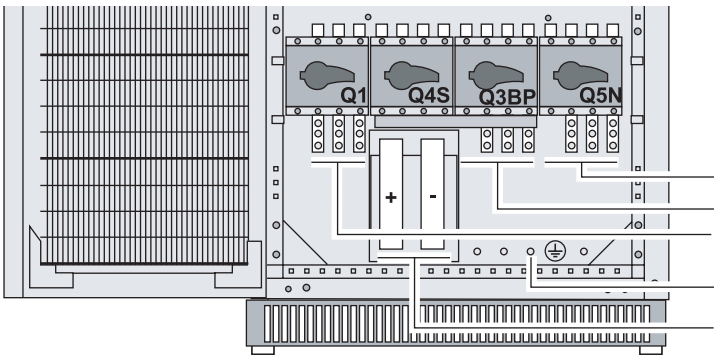
(10) Q3BP: bypass switch

(11) Q5N: UPS output switch

(12) Protection cover for power connections

(13) Screw-type terminal block for connection of contacts for parallel circuit breakers TB6, optional

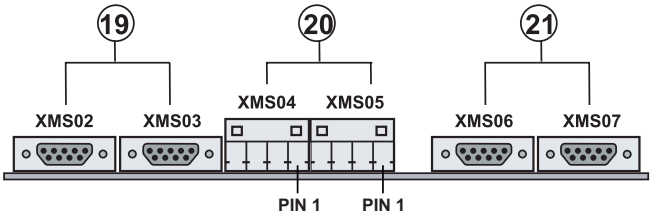
Figure 1-4: Power Connection Terminals



(14) Terminals for load output
(15) Terminals for bypass AC input
(16) Terminals for normal AC input

(17) Main grounding connector
(22) Connection of external battery (+/- poles)

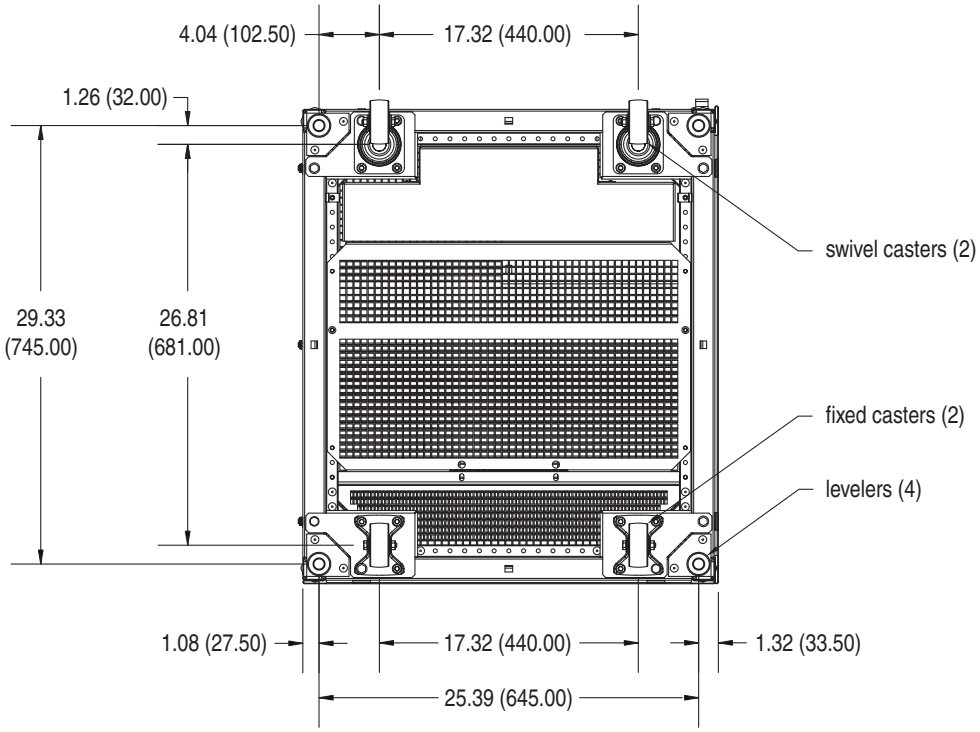
Figure 1-5: INTN PCA for Auxiliary Interconnections of Parallel UPSs



(19) DB9 connectors: exchange-current information
(20) Screw connectors: position information on Q5N, Q4S and Q3BP switches, from the external bypass
(21) DB9 connectors: CAN communication information between UPSs

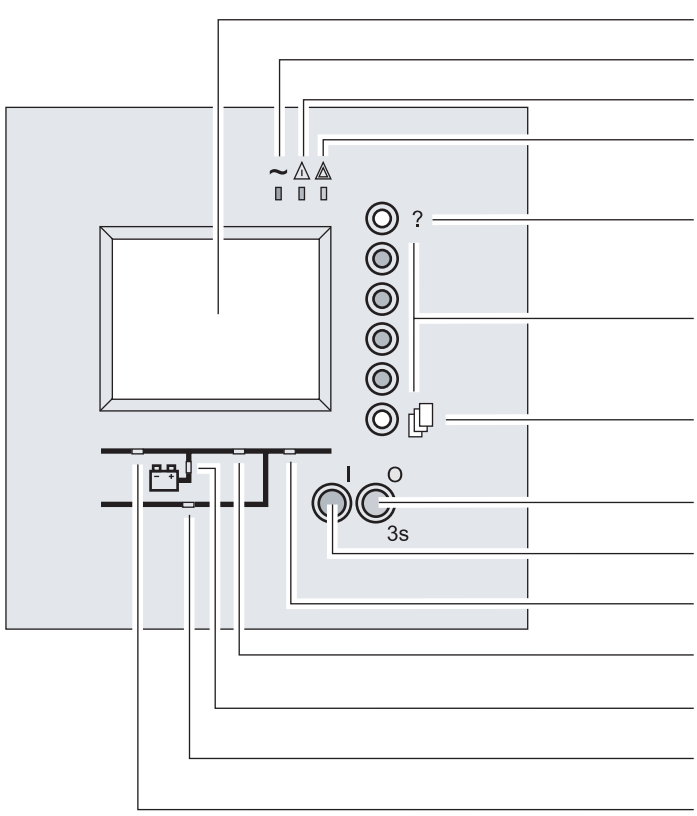
1.3 UPS Cabinet Bottom View Layout

Figure 1-6: MGE Galaxy 5000 Cabinet Bottom View Layout



1.4 User-Machine Interface Display

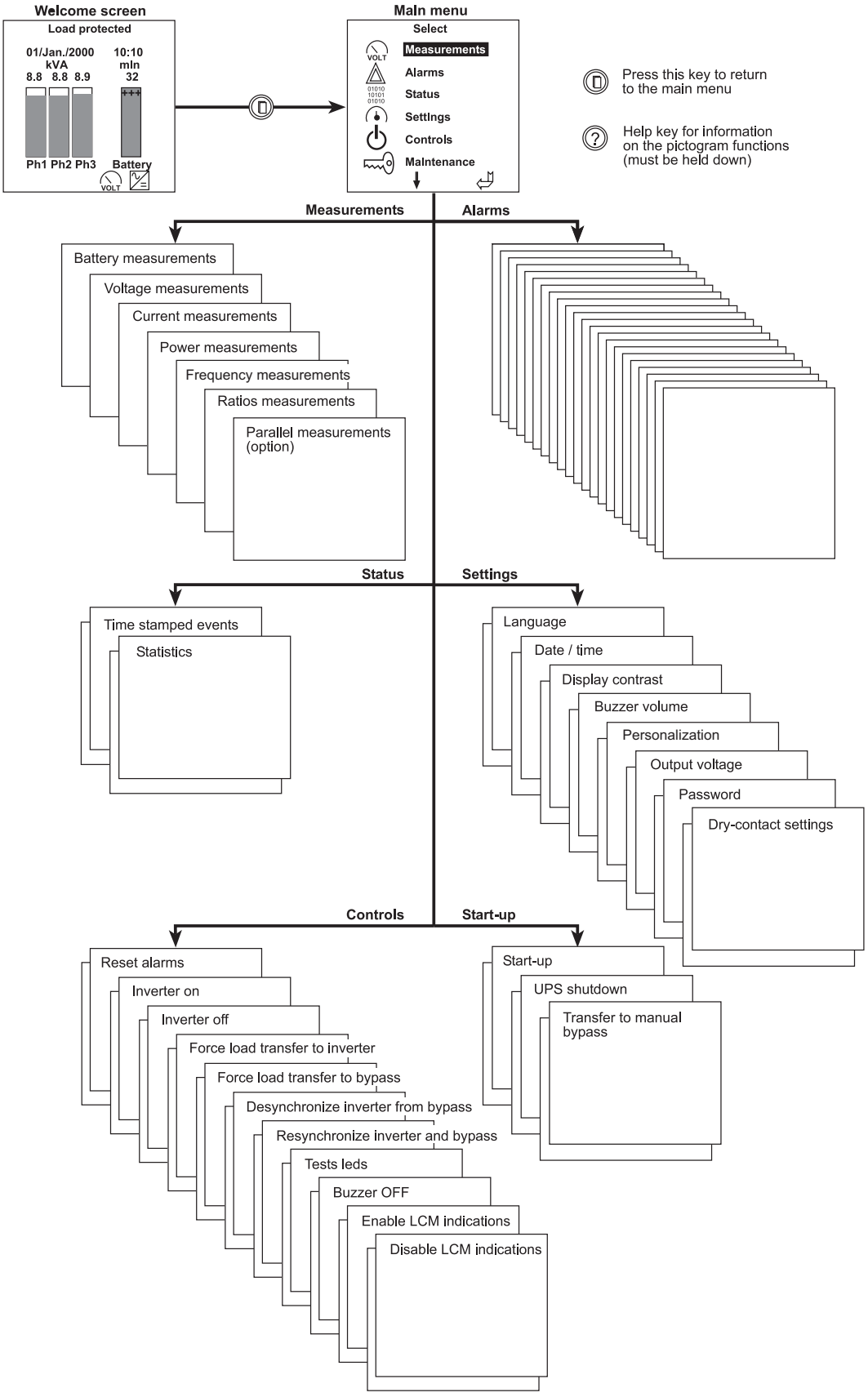
Figure 1-7: User-Machine Interface Display



(30) Graphical display
(31) Load protected LED
(32) Minor fault LED
(33) Major fault LED
(34) Help key
(35) Function keys
(36) Menu key
(38) OFF button
(37) ON button
(42) Load supplied LED
(40) UPS ON LED
(41) Operation on battery power LED
(43) Bypass in operation LED
(39) PFC ON LED

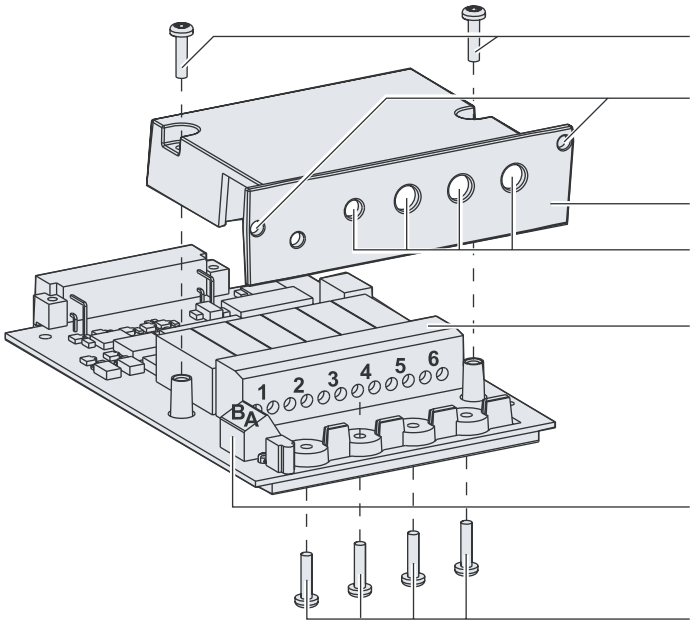
1.5 Display Screens

Figure 1-8: Display Screens



1.6 Relay Communication Card

Figure 1-9: Relay Communication Card



(50) Card cover screws

(51) Card screw holes

(52) Card cover

(53) Cable entry holes

(54) Output terminal block

(55) Input terminal block

(56) Cable clamping screws

(This page left blank intentionally)

2.0 Scope

Guides the user through performing connections required for initial installation. Included are the electrical specifications and connection details.

2.1 Location

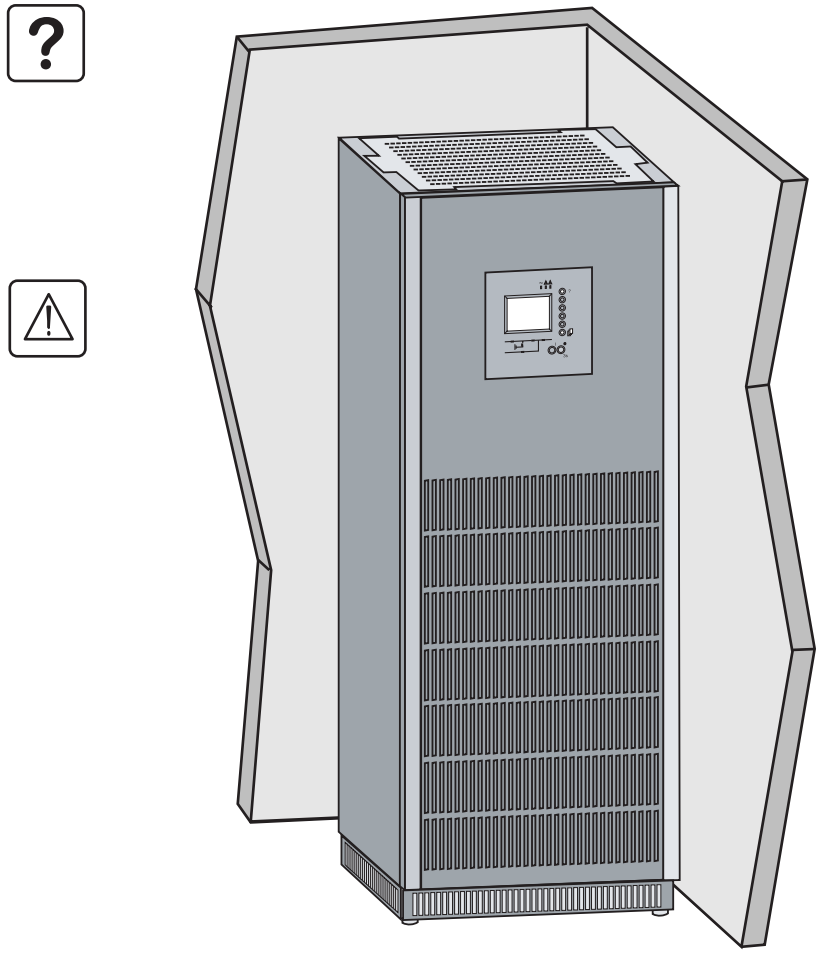
To ensure correct ventilation, leave nothing on top of the UPS.

Leave three feet of free space in front of the UPS for door opening.

The UPS cabinet rests on four levelers positioned in the four corners of the cabinet to spread the weight.

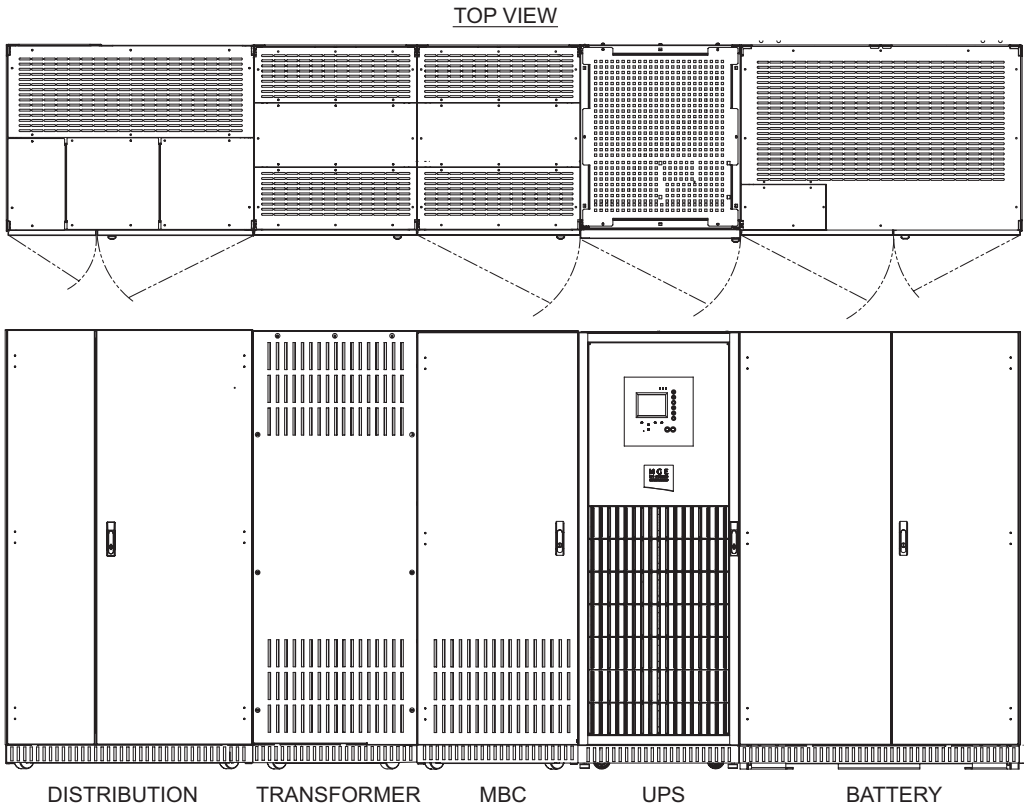
The UPS must be installed in a room with restricted access (qualified personnel only).

Figure 2-1: Installation of UPS



2.1.1 Layout of Cabinets

Figure 2-2: Layout of Cabinets (typical)



2.2 Electrical Specifications

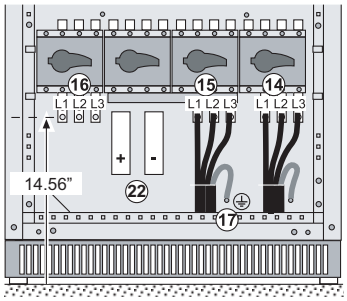
Table 2-1: Electrical Specifications for the MGE Galaxy 5000

Output Power Rating (0.9 PF)	40KVA	50KVA	60KVA	80KVA	100KVA	130KVA
UPS Voltage (input/output)	480/480	480/480	480/480	480/480	480/480	480/480
Input/Output Requirements & Frequency	Three phase, Three wire + G, 60Hz					
Input Phase Rotation	A, B, C Clockwise					
Input Power Factor	> 0.98					
Input Current/Input Current with Battery Charging Current	48A/59A	59A/70A	71A/88A	94A/111A	117A/150A	151A/182A
Maximum Input Current with Charging Current (at low line -10%)	57A	70A	85A	111A	148A	182A
Bypass/Output Current	48A	60A	72A	96A	120A	156A
Battery Voltage	356VDC End Voltage 432VDC Nominal 490VDC Max. Floating Voltage					
Max. Battery Current at Battery Voltage (432 VDC at 100% Load)	90A	113A	135A	180A	225A	293A
Max. Battery Current at End-Voltage (356 VDC at 100% Load)	109A	137A	164A	219A	273A	355A
Battery Disconnect Circuit Breaker Rating	175A, 250A, 400A					
Input, Bypass, Maintenance Bypass and Output Switch Rating	125A				250A	
Input and Output Fuse Rating	160A				315A	

CAUTION **Only an authorized electrical professional should access electrical connections. A severe shock hazard exists.**

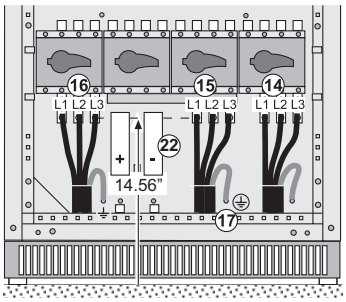
2.3 Connection of Power Cables in a Single UPS

Figure 2-3: Single UPS With Common Normal and Bypass AC Inputs



To access the connections, remove cover (see Section 1.3).
1 - The grounding conductors must be connected to the UPS grounding-plate connections **(17)**.
2 - Connect the three phases of the normal AC source to connection **(15)**.
3 - Connect the three phases supplying the load to connection **(14)**.
4 - Connect external battery (+/-) to connection **(22)**.
5 - Tie the cables down to the frame.
6 - Put the cover back in place.

Figure 2-4: Single UPS With Separate Normal and Bypass AC Inputs

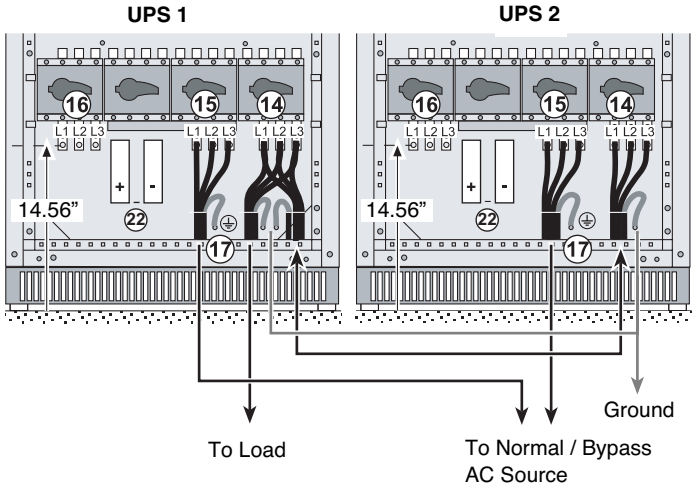


To access the connections, remove cover (see Section 1.3).
1 - The grounding conductors must be connected to the UPS grounding-plate connections **(17)**.
2 - Connect the three phases of the normal AC source to connection **(16)**.
3 - Connect the three phases of the bypass AC source to connection **(15)**.
4 - Connect the three phases supplying the load to connection **(14)**.
5 - Connect external battery (+/-) to connection **(22)**.
6 - Tie the cables down to the frame.
7 - Put the cover back in place.

2.4 Redundant Parallel Configuration (Maximum Two UPS Units for Pn)

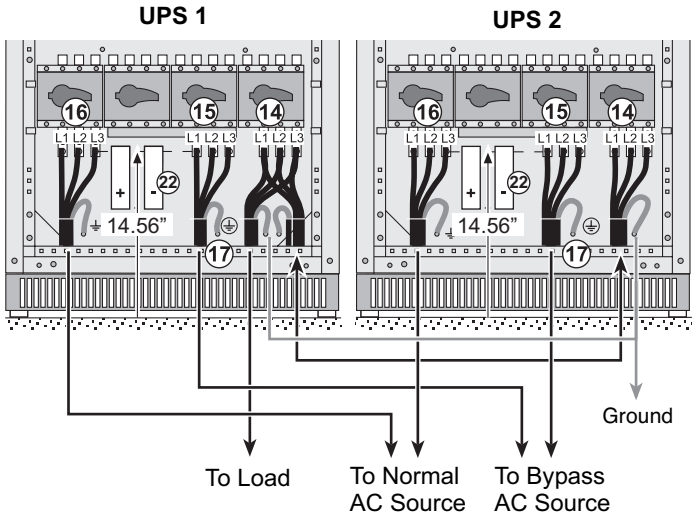
These configurations do not have an external System Bypass Cabinet (SBC).

Figure 2-5: Parallel UPS With Common Normal and Bypass AC Inputs



To access the connections, remove cover (see Section 1.3).
1 - The grounding conductors must be connected to the grounding-plate of each UPS **(17)**.
2 - Connect the three phases of the bypass AC source to connection **(15)** in each UPS.
3 - Connect the three phases of the supplied loads to connection **(14)** in UPS1.
4 - Connect **(14)** in UPS2 to **(14)** in UPS1 using the three load conductors.
5 - Connect the external battery (+/-) to connections **(22)** in UPS1 and UPS2.
6 - Tie the cables down to the cabinet frames.
7 - Put the covers back in place.

Figure 2-6: Parallel UPS With Separate Normal and Bypass AC Inputs



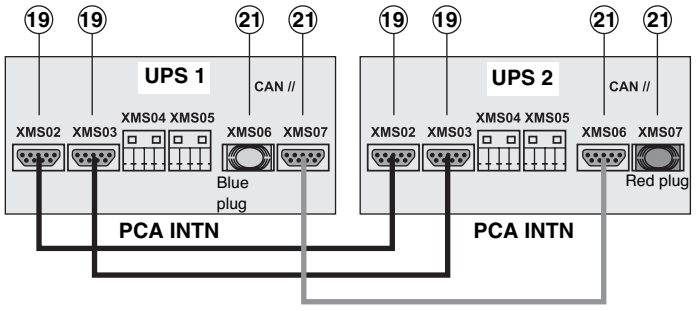
To access the connections, remove cover (see Section 1.3).
1 - The grounding conductors must be connected to the grounding-plate of each UPS **(17)**.
2 - Connect the three phases of the normal AC source to connection **(16)** in each UPS.
3 - Connect the three phases of the bypass AC source to connection **(15)** in each UPS unit.
4 - Connect the three phases of the supplied loads to connection **(14)** in UPS1.
5 - Connect **(14)** in UPS2 to **(14)** in UPS1 using the three load conductors.
6 - Connect the external battery (+/-) to connections **(22)** in UPS1 and UPS2.
7 - Tie the cables down to the cabinet frames.
8 - Put the covers back in place.

CAUTION

If the two UPSs are placed side by side, connect as indicated above. In the other configurations, always make sure that the cables between the UPSs and bypass AC source have the same cross-section and the same length. The same is true for the cables between the UPSs and the load.

2.5 Auxiliary Interconnections Between UPSs in Parallel Configurations

Figure 2-7: Redundant Parallel Configuration (Maximum Two UPS)



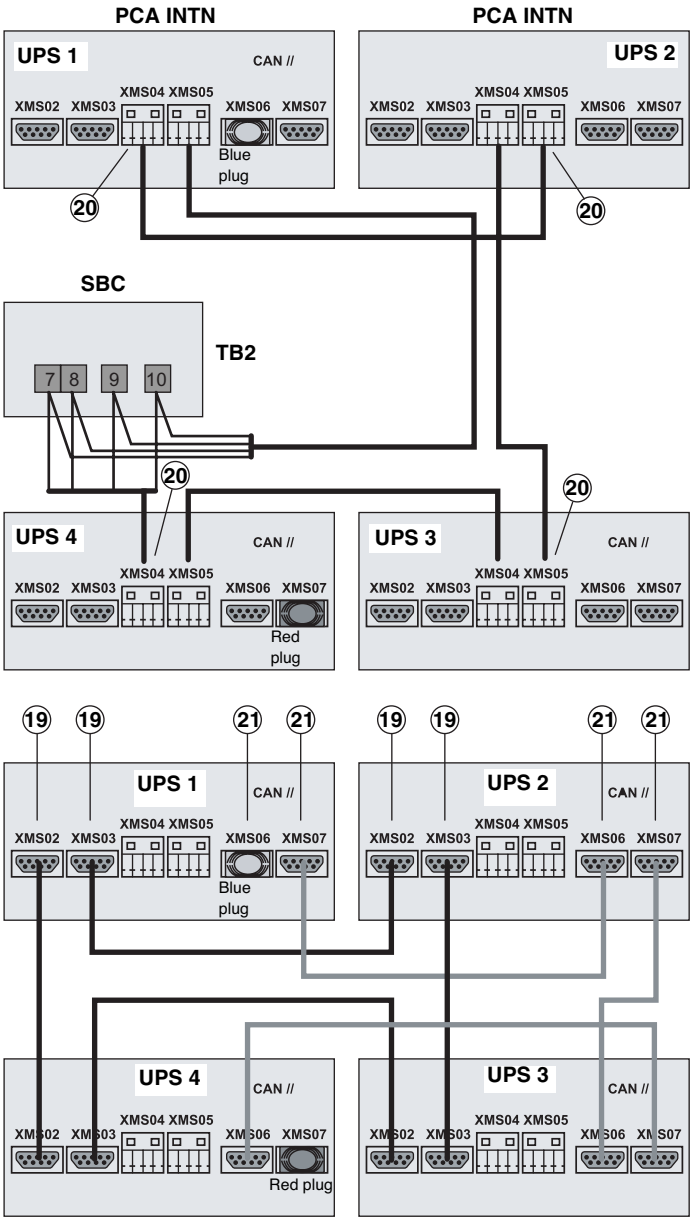
Exchange-current interconnections (19): Link connectors XMS02 and XMS03 on the two UPS units.

CAN // interconnections (21): Fit a blue plug on connector XMS06 on UPS1. Link connector XMS07 on UPS1 to connector XMS06 on UPS2. Fit a red plug on connector XMS07 on UPS2.

Note: The supplied cables (33 ft) limit the distance between the two UPS units to approximately 20 ft.

Figure 2-8: Parallel Configuration for Increased Capacity (Four UPSs)

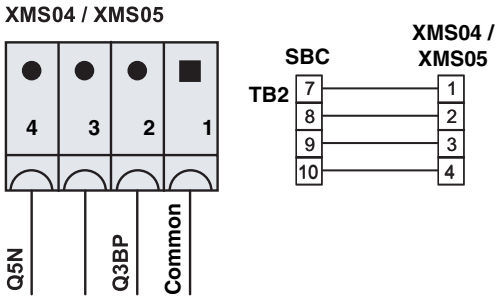
These configurations have an external System Bypass Cabinet (SBC).



Interconnections with the external system bypass cabinet (20):

- Interconnect terminals 7, 8, 9, and 10 on the auxiliary terminal block TB2 in the system bypass cabinet to UPS terminal blocks XMS04/XMS05 pins 1, 2, 3, and 4 respectively.
- Create a loop connection between the cabinet and the UPSs as shown in Figure 2-8.

Details of terminal block connections.



Note: The interconnection cables for the SBC are not supplied

Exchange-current interconnections (19):
Use the XMS02 and XMS03 connectors to create a loop between the UPSs (all the XMS02 and XMS03 connectors must be used).

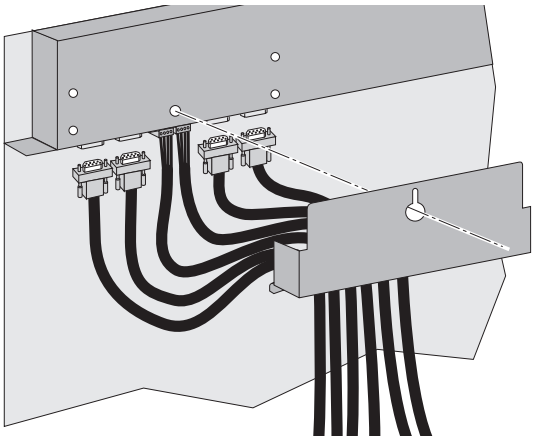
CAN // interconnections (21):
Daisy-chain the UPSs using the XMS06 and XMS07 connectors. Fit a blue plug on the first UPS unit and a red plug on the last UPS (all the XMS06 and XMS07 connectors must be used).

Note: The supplied cables are 33 ft long. To ensure sufficient isolation of exchange-current, CAN and external bypass cabinet cables, they must be run separately from the power cables.

Fitting the Protection Cover for the Auxiliary Interconnection Cables

The protection cover supplied with the parallel connected UPS units protects the user against direct contact with voltages other than SELVs and ensures the auxiliary interconnection cables are maintained in position.

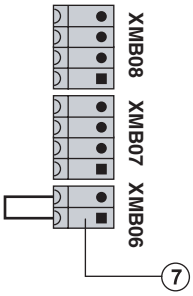
Figure 2-9: Fitting the Protection Cover for the Auxiliary Interconnection Cables



Note: Tie down the cables as indicated in the diagram in Section 2.9.

2.6 Connection of General Shutdown or Remote Emergency Power Off (REPO) Terminal Block

Figure 2-10: Connection of General Shutdown or Remote Emergency Power OFF (REPO) Terminal Block



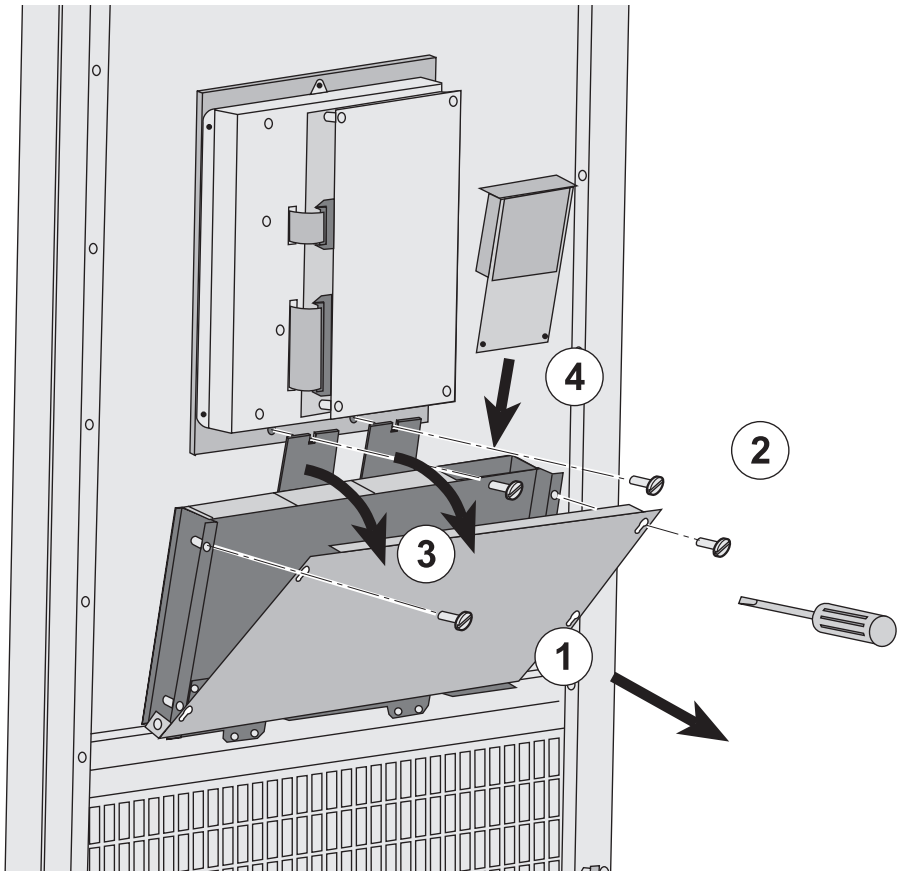
1 - Remove the wire jumper from terminal block **(7)**.
2 - Connect the general shutdown NC contact to terminals 1 and 2 (SELV).
3 - Tie the cable down as illustrated in Section 2.9.

CAUTION

Pressing the general shutdown button causes UPS shutdown and opening of the battery circuit breaker (with opening of the bypass static switch depending on personalization settings). The Remote Emergency Power Off (REPO) notion is applicable to installations where pressing the button also causes the upstream Normal AC source and bypass AC source circuit-breakers to open. In parallel configurations, there must be a single general shutdown button with a separate contact for each UPS unit.

2.7 Adding Communication Cards

Figure 2-11: Adding Communication Cards



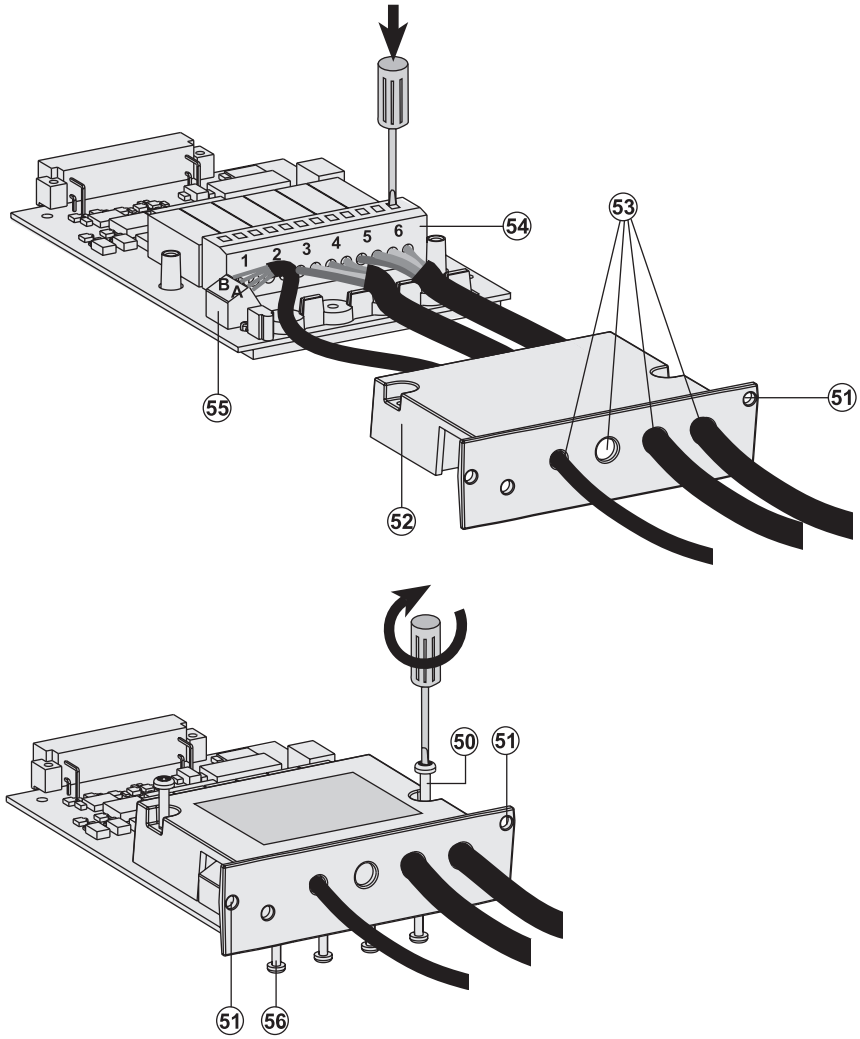
2.8 Connection of the Relay Communications Card

CAUTION

Isolate and lock-out all power sources for this card before making connections. Never connect SELV (safety extra low voltage) and non-SELV circuits to the different outputs of the same card.

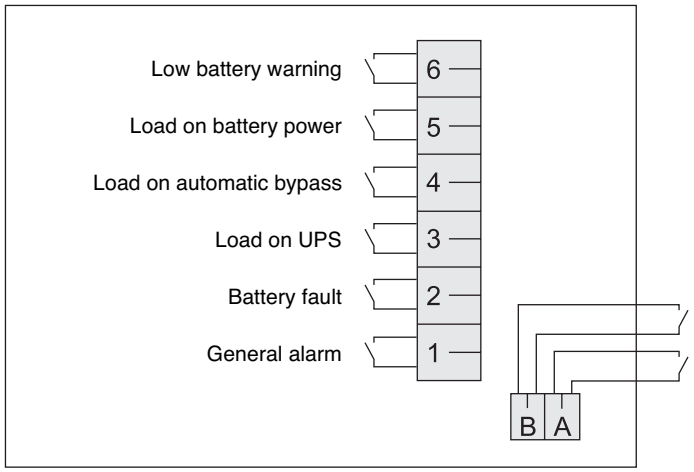
1 - Remove the cover **(52)** secured by the screws **(50)**.
2 - Run the communications cables through the cable entry holes **(53)**.
3 - Connect the conductors to the input **(55)** and output **(54)** terminal blocks.
4 - Put the cover back in place and secure it with the screws **(50)**.
5 - Tighten the screws **(56)** to lock the cables.
6 - Indicate the locations of the power sources on the labels.
7 - Insert the card in its slot.
8 - Secure the card with two screws **(51)**.

Figure 2-12: Connection of Relay Communication Card



2.8.1 Characteristics of the Contacts on the Relay Communications Card

Figure 2-13: Characteristics of the Contacts on the Relay Communications Card



Characteristics of the output contacts:
Permissible voltage: 250V AC, 30V DC.
Permissible current: 2 A.
Cable: 4 x 0.93 mm2, Ø 6.6 ± 0.3 mm.

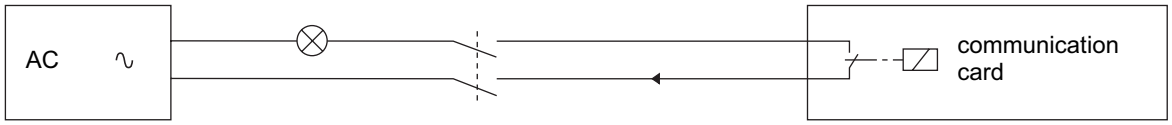
Characteristics of the input contacts:
Switched voltage: 5 V DC
Consumption: 10 mA.
Cable: 4 x 0.34 mm2, Ø 5 ± 0.5 mm.

UPS OFF

UPS ON

Communications Card Connection Example

If a SELV (safety extra low voltage) source is used, it must always be possible to isolate the communications card from the upstream source to ensure the safety of personnel working on the installation.

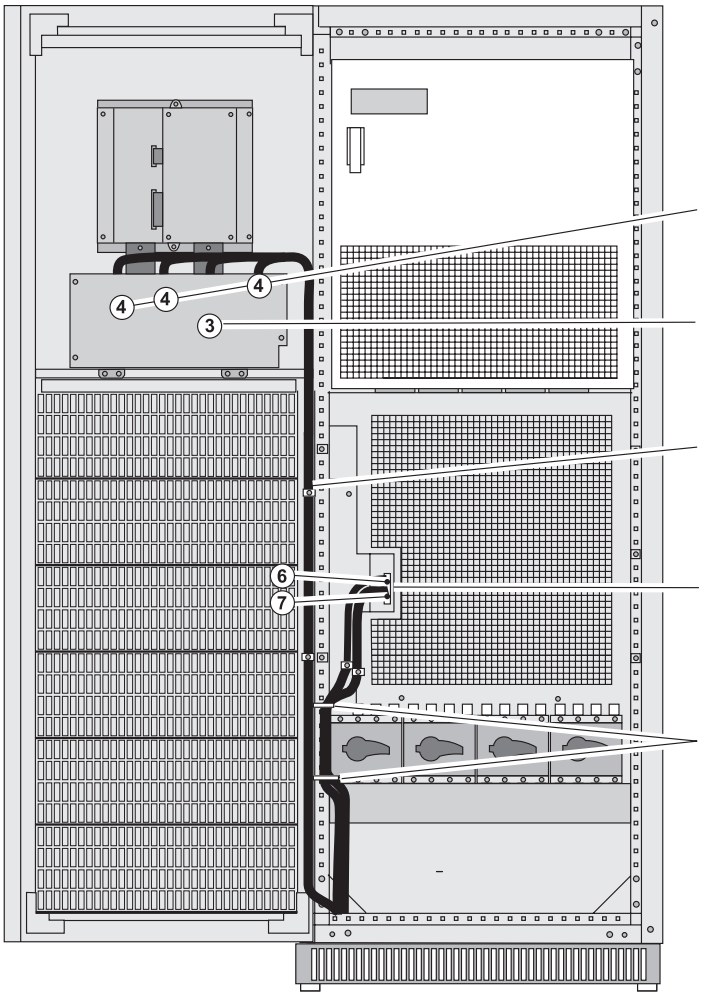


Disconnecting device that can be locked

2.9 Routing the Control/Communications Cables

Single UPS

Figure 2-14: Routing the Control/Communications Cables for Single UPS



Separate the control and communication cables from the power cables.
Run the cables together in front of the protection panels and tie them to the panels as indicated.

Free slots for optional communication cards. See installation drawing for proper card placement.

Slot for relay communications card

Tie

General-shutdown cable (not supplied) and external battery circuit breaker cable must be tied down separately.

Ties

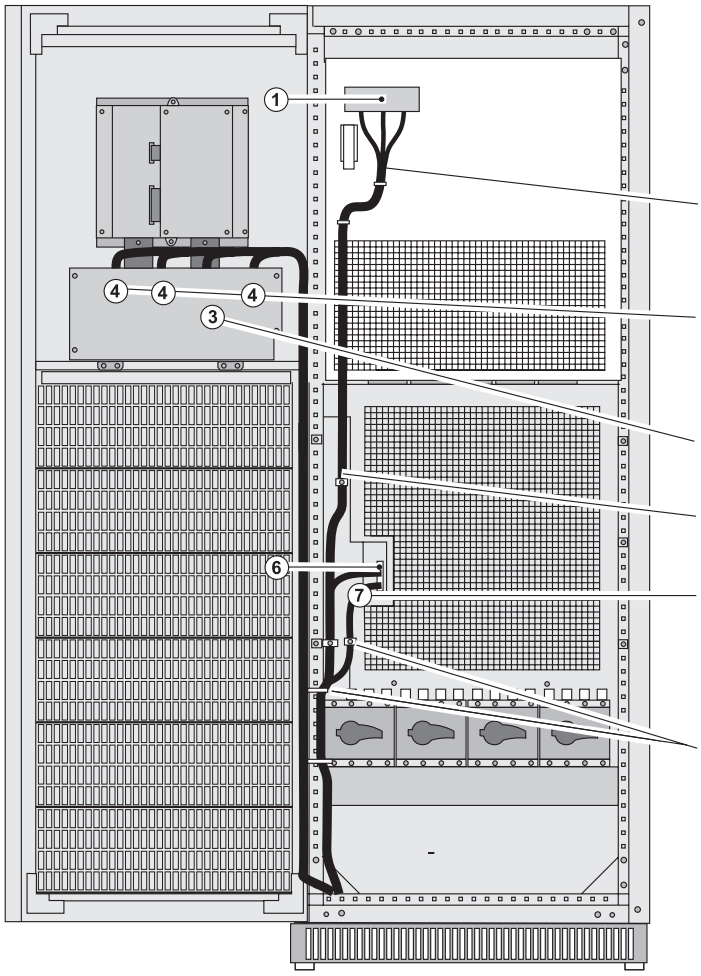
Cable description	Insulation level	Location on illustration
Relay communication card	SELV	3
Optional communication card	SELV or LV	4
External battery circuit-breaker cables	SELV	6
General-shutdown cable	SELV	7

CAUTION

To ensure sufficient isolation of control and communication cables, they must be run separately from the power cables. Reinforce the insulation of these control and communication cables if any risk of contact with the power cables exists.

Parallel UPS

Figure 2-15: Routing the Control/Communications Cables for Parallel UPS



Separate the control and communication cables from the power cables.
Run the cables together in front of the protection panels and tie them to the panels as indicated.

Parallel-connection cables for connection to the SBC (not supplied). The CAN and current exchange cables are supplied.

Free slots for optional communication cards. See installation drawing for proper card placement.

Slot for relay communications card

Ties

General-shutdown cable (not supplied) and external battery circuit breaker cable must be tied down separately.

Ties

Cable description	Insulation level	Location on illustration
External bypass cabinet cable	ELV	1
CAN cables	SELV	1
Exchange-current cables	SELV	1
Relay communication card	SELV	3
Optional communication card	SELV or LV	4
External battery circuit-breaker cables	SELV	6
General-shutdown cable	SELV	7

CAUTION

To ensure sufficient isolation of exchange-current, CAN and external bypass cabinet cables, they must be run separately from the power cables. Reinforce the insulation of these control and communication cables if any risk of contact with the power cables exists.

CAUTION

All operations concerning system start-up and compliance with standards and regulations, including those related to the battery cabinet, must be carried out by trained and certified personnel before using the UPS.

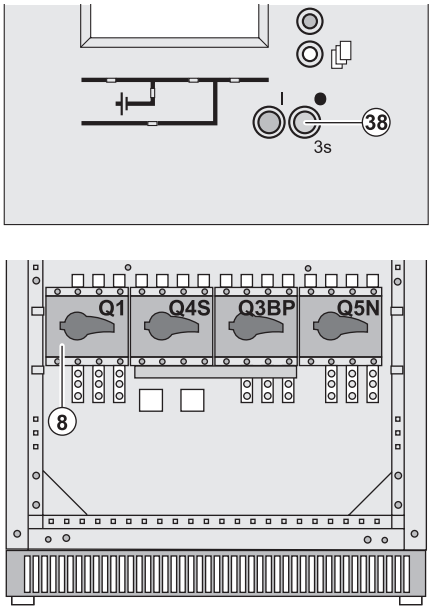
3.0 Scope

Provides startup, shutdown, and normal operation of the MGE Galaxy 5000 UPS. Describes the operation of the mimic-panel LEDs.

3.1 Shutting Down a Single UPS

The UPS remains energized unless it is shut down.

Figure 3-1: Shutting Down a Single UPS



1 - Press a button to exit sleep mode.
2 - Press the OFF button **(38)** for 3 seconds.

The load is no longer protected by the UPS. It is supplied via the bypass.

3 - Set the battery circuit breaker of the auxiliary cabinets to OFF.
4 - Set the input switch Q1 **(8)** to OFF.

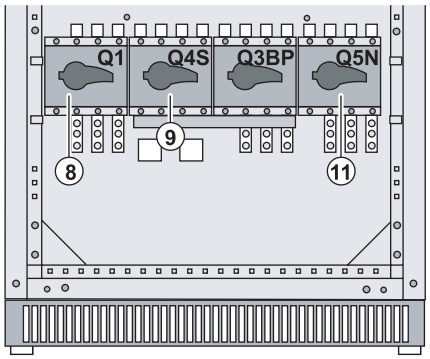
The charger no longer operates to keep the batteries fully charged.

5 - Open the upstream circuit breakers of the Normal AC source and Bypass AC source to completely power off the UPS.

3.2 Restarting a Single UPS

Check that switches Q4S **(9)** and Q5N **(11)** are closed. If this is the case, continue with this procedure, otherwise refer to Section 4.4.1 "Return to the Normal Operation, Single UPS".

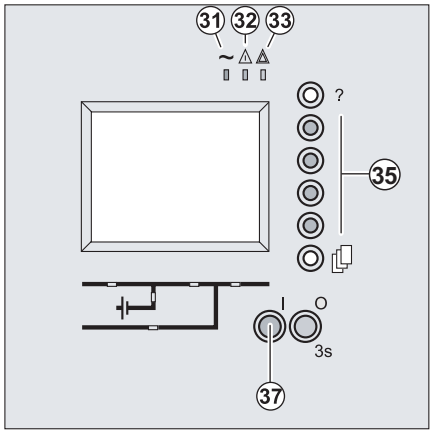
Figure 3-2: Restarting a Single UPS



1 - Set the Normal AC source input switch Q1 **(8)** to the ON position.
2 - Wait until the end of the start sequence.
3 - Set the battery circuit breaker of the auxiliary cabinets to the ON position.

The UPS starts automatically.
LED **(31)** is ON.

The load is protected by the UPS.

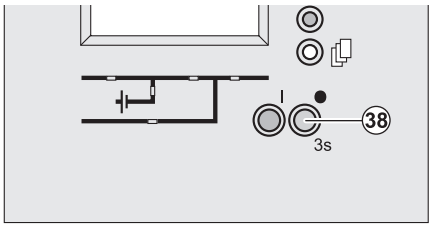


If LED **(31)** remains OFF, press the ON button **(37)** (the UPS is in manual start mode) and confirm if necessary by pressing the function key **(35)** marked ⏎ .

If LED **(31)** still remains OFF and either of LEDs **(32)** or **(33)** is ON, a fault has occurred (see Section 4.1).

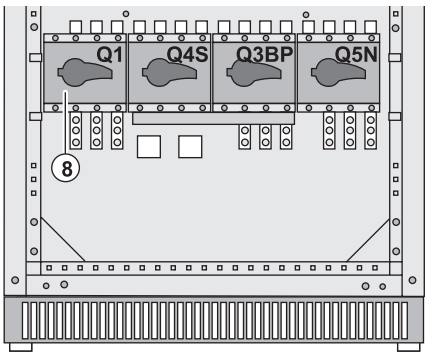
3.3 Shutting Down a Parallel Configuration

Figure 3-3: Shutting Down a Parallel Configuration



1 - Press a button on each unit to exit sleep mode.
2 - Press the OFF button **(38)** on each unit for 3 seconds.

The load is no longer protected by the UPSs. It is supplied via the bypass.



3 - Set the battery circuit breakers of the auxillary cabinets to the OFF position.
4 - Set the input switch Q1 **(8)** in each UPS to the OFF position.

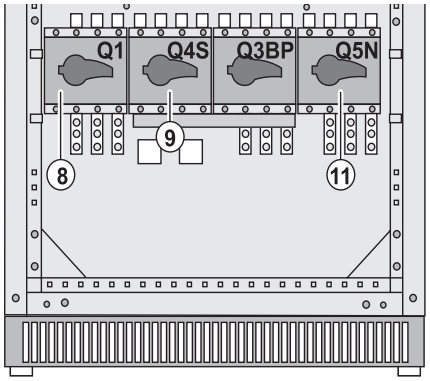
The charger no longer operates to keep the batteries fully charged.

5 - Open the upstream circuit breakers of Normal AC source and Bypass AC source to completely power off the installation.

3.4 Restarting a Parallel Configuration

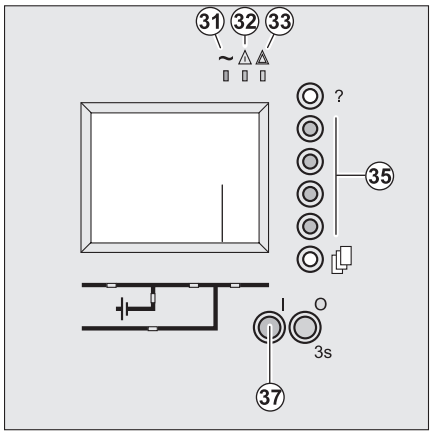
Check that switches Q4S **(9)** and Q5N **(11)** are closed. If this is the case, continue with this procedure, otherwise refer to Section 4.4.2 or Section 4.4.3 "Return to the Normal Operation, Parallel UPS".

Figure 3-4: Restarting a Parallel Configuration



1 - Check that the output switch CB2 in the external system bypass cabinet is closed.
2 - Check that the bypass switch CB1 in the external system bypass cabinet is open.

Then carry out steps 3 to 5 below on each of the UPSs.
3 - Set the Normal AC source input switch Q1 **(8)** to the ON position.
4 - Wait until the end of the start sequence.
5 - Set the battery circuit breaker of the auxiliary cabinets to the ON position.



The UPSs start automatically. On each unit, LEDs **(32)** and **(33)** go OFF and LED **(31)** goes ON.

The load is protected by the UPSs.

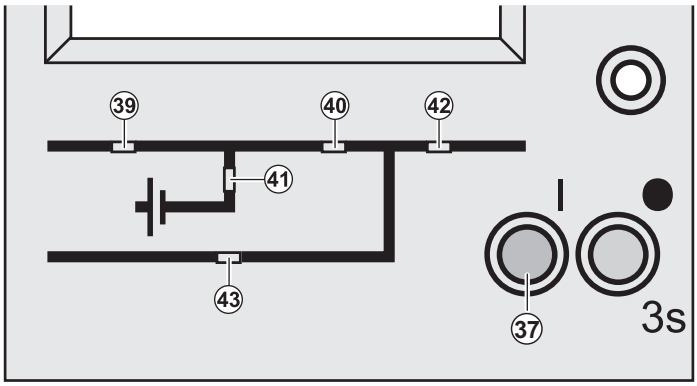
If LED **(31)** remains OFF, press the ON button **(37)** on each UPS (the UPS is in manual start mode) and confirm if necessary by pressing the function key **(35)** marked ⏎.

If LED **(31)** still remains OFF and either of LEDs **(32)** or **(33)** is ON, a fault has occurred (see Section 4.1).

3.5 Operation of Mimic-Panel LEDs

The MGE Galaxy 5000 system is simple to operate and yet provides a wealth of continuous monitoring and diagnostic features to ensure proper operation. Operators gain access to information in the MGE Galaxy 5000 system through the display and its integrated LED mimic panel.

Figure 3-5: Operation of Mimic-Panel LEDs



Single UPS Start Sequence on Normal AC Input

Steps	Action	LED **(39)**	LED **(40)**	LED **(41)**	LED **(42)**	LED **(43)**
1	Q1 open	Off	Off	Off	Off	Off
2	Close Q1	green	Off	red	Off	red
3	Close Battery CB	green	Off	Off	Off	red
4	Close Q4S	green	Off	Off	Off	green
5	Close Q5N	green	Off	Off	green	green
6	Open Q3BP	green	Off	Off	green	green
7	Press ON button (37)	green	green	Off	green	Off

Single UPS Start Sequence on Bypass AC Input

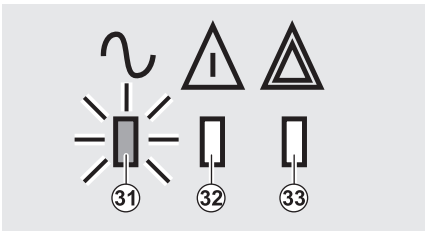
Steps	Action	LED **(39)**	LED **(40)**	LED **(41)**	LED **(42)**	LED **(43)**
1	Q4S open	Off	Off	Off	Off	Off
2	Close Q4S	Off	Off	red	Off	green
3	Close Q5N	Off	Off	red	green	green
4	Open Q3BP	Off	Off	red	green	green
5	Close Q1	green	Off	red	green	green
6	Close Battery CB	green	Off	Off	green	green
7	Press ON button (37)	green	green	Off	green	Off

3.6 Operating Modes

Normal (Double Conversion) Mode

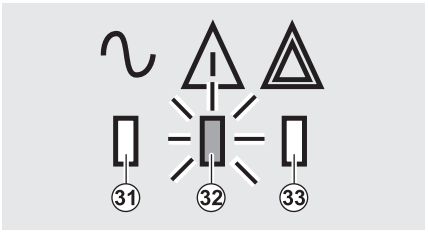
This is the standard operating mode, set by default in the factory. Two possible cases:

Figure 3-6: Normal (Double Conversion) Operating Mode



1 - Normal AC source available:
LED **(31)** is ON.

The load is protected by the UPS.



2 - Normal AC source not available:
LED **(32)** is ON.
The buzzer sounds intermittently.
LED **(41)** on the mimic-panel is green.

The load is supplied by the UPS from battery power.

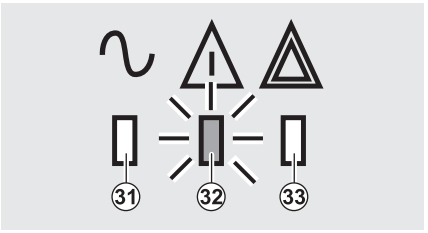
The display indicates any anomalies related to the AC source or the UPS as well as remedial action if applicable.
Press the function key **(35)** indicated by the display to turn the buzzer OFF.

3.7 Load on Battery Power

The load continues to be protected by the UPS when the normal AC source is not available. Power is supplied by the battery.

Figure 3-7: Load on Battery Power

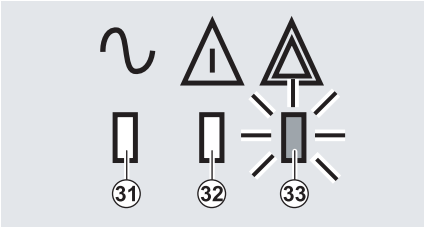
Transfer to Battery Power



LED **(32)** is ON.
The buzzer sounds intermittently.

The load is supplied by the battery.

End of Battery Power



LED **(33)** is ON.
The buzzer sounds intermittently.

The load is transferred on the bypass AC input if it is present.

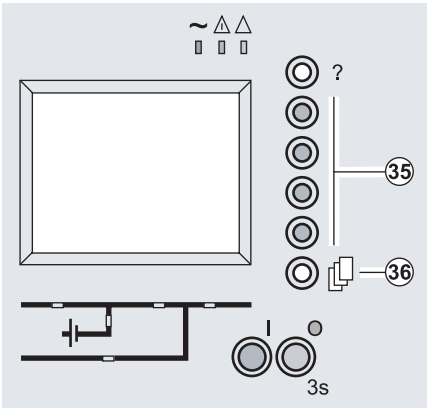
3.8 UPS Personalization

Access to the Personalization Functions

CAUTION

Personalization must be carried out with switches Q1 (8) and Q5N (11) open (OFF) and switch Q4S (9) closed (ON).

Figure 3-8: UPS Personalization



1 - Press the menu key **(36)**.
2 - Select "Settings", then "Personalization" using the function keys **(35)** ↑ or ↓.
3 - Confirm by pressing the function key **(35)**.
4 - Enter the password by successively selecting each icon using the corresponding function key.
5 - Confirm by pressing the function key **(35)**.
6 - To save the personalization settings, confirm by pressing the function key **(35)**.

The password Ø Ø Ø ↵ is factory set.

To change the password, see the Settings menu.

Personalization Settings

Operating Mode

Function	Factory setting	Options
UPS operating mode	NORMAL	
UPS automatic start	Disabled	Enabled
Authorized number of starts	4	1 to 255
Delay before reset of number of executed automatic starts	4 seconds	1 to 60 seconds

Frequency

UPS output frequency	60 Hz	60Hz
Tolerance for bypass AC source	8 %	0.5 - 1 - 2 - 4 %
Synchronization speed with bypass AC source	2 Hz / s	1 Hz / s

Automatic Bypass

Transfer to bypass AC source	Enabled	Disabled – disabled when limiting
Transfer to bypass with bypass AC source out of tolerances	Enabled	Disabled

Battery

Low battery warning threshold if battery monitor inactive	40% remaining backup time	20 - 60 - 80 % remaining backup time
Low battery warning threshold if battery monitor active	4 minutes of battery backup time	1 to X minutes of battery backup time
Interval between two battery tests	30 days	1 to 180 days

3.9 Display Messages List

Fault of downgraded mode
Internal CAN communication fault
External CAN communication fault
CAN communication relay fault
UPSs not connected by CAN cable
Resynchronizing
CAN communication resynchronization fault
Loss of communication with UPS 1
Loss of communication with UPS 2
Loss of communication with UPS 3
Loss of communication with UPS 4
Loss of communication with UPS X

Fault, filtering of customer communication
Customer communication disabled

Generic fault on equipment
Emergency Power Off (EPO)
UPS personalization fault
Personalization does not match UPS
Transfer to bypass disabled

Major Fault on subassembly
Charger fault
Bypass static switch fault
PFC fault
Inverter fault
Power supply board fuse blown
Fan fault
TVSS fault

Internal and external switches
Q3BP switch closed
Q5N switch open
Q4S switch open
External Q3BP switch closed (MBC or SBC CB1)
External Q5N switch open (MBC or SBC CB2)
External Q4S switch open (MBC CB3)
Abnormal bypass operation
Abnormal external bypass operation

Fault or state of installation
Installation overload
Non-redundant installation
Inverter starting
Not enough inverters for load connection
Not enough bypass static switches
Inverter ready for load connection

Fault or state on Normal AC
Q1 switch open
Normal AC source downgraded
Normal AC input phase rotation fault
Normal AC fuse blown
Normal AC source static switch failure
Normal AC source outside tolerances
Normal AC backfeed (KA1) is open
Normal AC backfeed (KA1) fault

Fault or state on Bypass AC or Bypass Static Switch
Bypass source present
Bypass static switch overload
AC Bypass static switch thermal overload
Bypass input phase rotation fault
Bypass source outside tolerances
Bypass AC backfeed (KA2) is open
Bypass AC backfeed (KA2) fault

Fault or state for PFC
PFC overload
PFC thermal overload
Starting

Fault or state standard charger
Low battery warning
Low battery shutdown
Battery circuit breaker open (QF1) (Battery Cabinet #1 or #3)
Battery circuit breaker 2 open (QF2) (Battery Cabinet #2 or #4)
End of theoretical battery service life
Battery temperature fault
Battery deep discharge
Battery room temperature fault
Battery test result not OK
Battery test in progress
Charger shutdown by PFC overload

Fault or state inverter
Inverter current limiting
Inverter overload
Inverter thermal overload
Inverter fuse blown
Inverter and bypass desynchronized

Fault or state load
Abnormal presence of output voltage
Load short circuit

Fault or state external synchronization
External sync frequency outside tolerances
UPS on external synchronization

3.10 Operation of the Relay Communication Card (Dry Contacts)

All systems are equipped with this remote transmissions card (also known as SECI).
A complete specification exists for the card used in MGE Galaxy 5000.
This card is used for the transmission of information between the system and the environment.
Two inputs and six outputs are available for the user (see the table below for the default programming).

3.10.1 Standard Mode

It is compatible with all MGE systems that are I²C compatible.

All the SA1 microswitches must be set to OFF (if two SECI cards are installed in the unit, the second card must be identified differently. On the second card, microswitch 1 on SA1 must be set to ON).

In this mode, the relays switch when the UPS changes status. The information listed below is transmitted if the parameters were enabled in UPS Tuner.

Inputs	Factory configuration	Other possible signals for each contact
1 A	UPS ON	- Temperature fault in room - Transfer to bypass AC input disabled - Transfer to bypass AC input disabled if it is out of tolerances - UPS not synchronized with the bypass AC input
1.B	UPS OFF	

Outputs	Factory configuration	Other possible signals for each contact
1.1	General alarm	- Overload - PFC fault - Inverter fault - Charger fault - Automatic-bypass fault - Bypass AC source out of tolerances - Battery-temperature fault - Ventilation fault - Emergency power OFF activated - Battery circuit breaker(s) open - Phase inversion on normal or bypass AC input - Fuses blown - Transfer to AC bypass disabled - Operation in ECO mode - Load on maintenance bypass
1.2	Battery fault	
1.3	Load on UPS	
1.4	Load on automatic bypass	
1.5	Load on battery power	
1.6	Low battery warning	

The indications 1.X become 2.X for a second identical card in the UPS.
Contacts are of the NO (normally open) type.
(1) The general alarm can be tested by opening the battery circuit breaker.

3.10.2 Programmable Mode

This operating mode is specific to the MGE Galaxy 5000. The description in this document concerns only the MGE Galaxy 5000.

Microswitch 3 on SA1 must be set to **ON** (if two SECI cards are installed in the unit, the second card must be identified differently. On the second card, microswitch 1 on SA1 must be set to ON).

In this mode, it is possible to assign predefined operating status conditions (see the complete list) to the various SECI output relays and predefined UPS commands to the SELV inputs.

Assignments are made using the MGE Galaxy 5000 user-machine interface.

3.10.3 List of Operating Status Conditions That May be Assigned to an SECI Output

Operating status conditions	Description
GENERAL ALARM	PFC fault OR Inverter fault OR Bypass static switch fault OR Charger fault OR Thermal overload on AC bypass OR Normal AC input fuse blown OR ALIN board input fuse blown OR Q3BP and Q5N are closed simultaneously OR External Q3BP and external Q5N are closed simultaneously OR EPO activated OR Battery backup time ended, shift to wait mode OR Battery temperature fault > 45°C , charger shutdown OR Battery deep discharge OR Charger shutdown due to battery room temperature outside tolerances OR Abnormal presence of voltage on the output before closing the bypass static switch. (frequency converter) OR UPS in downgraded mode OR External CAN communication fault OR Internal CAN communication fault (GDEN, MIZNUS and CHAN) OR CAN cable physically cut OR CAN communication relay fault OR UPS personalization fault.
BATTERY FAULT	The battery will soon reach the end of its theoretical service life OR Battery must be checked (following a faulty battery test)
LOAD ON UPS	Inverter connected to the load and operating on normal AC input. Battery operations due to a BPI or battery test are signalled as operation on the normal AC input.
LOAD ON AUTOMATIC BYPASS	The static switch on the AC bypass is closed.
LOAD ON BATTERY POWER	Inverter connected to the load and operating on battery power. Battery operations due to a battery test are not signalled.
LOW BATTERY WARNING	Battery has reached the low-battery warning level (voltage or time). The two thresholds may be user set.
OVERLOAD	One of the unit modules (rectifier, inverter or AC bypass) is overloaded (thermal or instantaneous).

PFC FAULT	Neutral leg fault OR Neutral leg IGBT temperature outside tolerances OR Voltage difference between 2 DC half-buses outside tolerances OR Top DC half-bus voltage outside tolerances OR Bottom DC half-bus voltage outside tolerances PFC fault OR DC-bus voltage at end of CSR1 walk-in is lower than a threshold OR DC-bus voltage at end of DC walk-in is lower than a threshold OR DC-bus voltage is higher than the high threshold OR DC-bus voltage is lower than the minimum threshold Mean DC-bus voltage is higher than the maximum setpoint OR Mean DC-bus voltage is lower than the minimum setpoint OR DC-bus voltage is higher than the fast hardware threshold OR Temperature of the static switch on the AC normal outside tolerances OR Temperature of the battery static switch outside tolerances OR Rectifier is current limiting OR Rectifier thermal overload OR PFC IGBT base-plate temperature outside tolerances OR IGBT inductor temperature outside tolerances.
INVERTER FAULT	Inverter short-circuit detected OR Inverter current limiting OR Inverter static switch failure OR Temperature fault on inverter static switch OR Inverter base-plate temperature outside tolerances OR Inverter thermal overload OR Inverter phase-1 fuse has blown OR Inverter phase-2 fuse has blown OR Inverter phase-3 fuse has blown OR Inverter phase-1 voltage amplitude outside tolerances OR Inverter phase-2 voltage amplitude outside tolerances OR Inverter phase-3 voltage amplitude outside tolerances OR Instantaneous inverter voltage outside tolerances OR Inverter relay for parallel connection is faulty.
CHARGER FAULT	Fault of non-isolated supply on charger board OR Fault of isolated supply on charger board OR Opening fault on battery circuit breaker no. 1 OR Opening fault on battery circuit breaker no. 2 OR Charger IGBT temperature outside tolerances OR Difference in charge-current measurements between safety and measurement systems OR Charge current on measurement system close to zero OR Charge current on safety system close to zero OR Charge current is higher than safety level OR Difference in voltage measurements between safety and measurement systems OR Voltage on measurement system close to zero OR Voltage on safety system close to zero OR Battery voltage higher than safety level OR Charger fuse blown.
AUTOMATIC-BYPASS FAULT	Supply fault for the static switch on the AC bypass OR Fault on static switch on AC bypass OR Temperature of the static switch on the AC bypass outside tolerances.
BYPASS AC SOURCE OUT OF TOLERANCE	Bypass AC source outside of tolerances (voltage and/or frequency).

BATTERY TEMPERATURE FAULT	Battery ambient temperature outside tolerances.
VENTILATION FAULT	Excessive temperature on one or more inductors OR Inverter or AC bypass static switch fan fault.
EMERGENCY POWER OFF ACTIVATED	EPO set on control-monitoring board OR EPO set on charger board.
BATTERY CIRCUIT BREAKER(S) OPEN	One or two Battery circuit breaker is open.
PHASE ROTATION FAULT	Phase inversion on normal AC input OR Phase inversion on AC bypass.
FUSES BLOWN	Fuse blown at normal AC input OR Charger fuse has blown OR Power supply board fuse has blown OR Inverter phase-1 fuse has blown OR Inverter phase-2 fuse has blown OR Inverter phase-3 fuse has blown.
TRANSFER TO BYPASS DISABLED	Transfer to AC bypass disabled (control and monitoring board checks for disabling by the personalization and/or an SECI input).
ECO MODE ACTIVATED	The unit is operating in ECO mode. It is configured for ECO mode and the static switch on the AC bypass is closed.
MAINTENANCE POSITION	Switch Q5N is open.
CHECK THE UPS	A Life Cycle Monitoring alarm has been activated: ◗ End of warranty. ◗ End of AC capacitor service life ◗ End of DC capacitor service life ◗ End of fan service lives. ◗ End of power supply board service life. ◗ End of battery service life.

Galaxy 5000 can be equipped with up to two SECI cards maximum. In this case, the second card must be identified differently. On the second card, microswitch 1 on SA1 must be set to ON.

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4.0 Scope

Identifies alarm conditions, UPS isolation operation, and maintenance and safety information on servicing batteries for the MGE Galaxy 5000.

4.1 Identification of Alarms

Alarm conditions are identified by LEDs **(31)**, **(32)**, **(33)** and the buzzer.

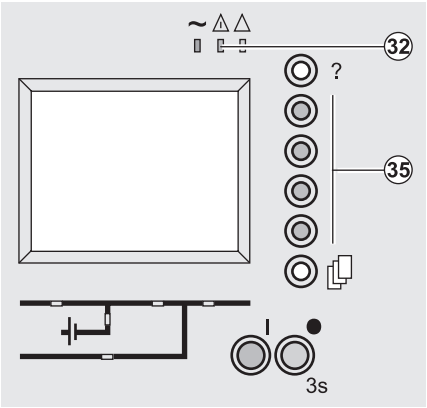
Table 4-1: Identification of Alarms

LED (31)	LED (32)	LED (33)	Buzzer	Significance
–		–	Intermittent	Normal AC source not available
–	–		Intermittent	UPS shut down following end of battery power
–	–		Intermittent	UPS shut down on fault requiring servicing by after-sales support

Detailed information on all alarms is supplied on the display.
1 - On the screen, select the alarm for which information is required.
2 - Hold down the corresponding function key to display the possible causes of the fault and the required action.

4.2 Life Cycle Monitoring (LCM)

Figure 4-1: Life Cycle Monitoring (LCM)



- The "Life Cycle Monitoring" (LCM) function provides UPS maintenance advice to guarantee installation availability for the user.

- The display gives 3 messages enabling the following to be identified:
  - The end of the contractual legal warranty: **"End of warranty check recommended"**.
  - Regular maintenance requirements and the end of service life for consumable components: **"Technical check recommended"**.
  - The end of the battery service life: **"Battery check required"**.

In addition to these messages, the minor fault LED (**32**) lights up and the buzzer sounds.
These messages can be deleted by pressing the function key **(35)**. This also causes LED **(32)**, to go out, the buzzer to stop and the removal of the "Global Alarm" remote signaling.

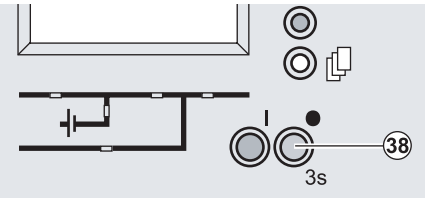
To completely disable LCM indications, use the display to enter the password required to disable the function.

4.3 UPS Isolation

4.3.1 UPS Isolation Single UPS

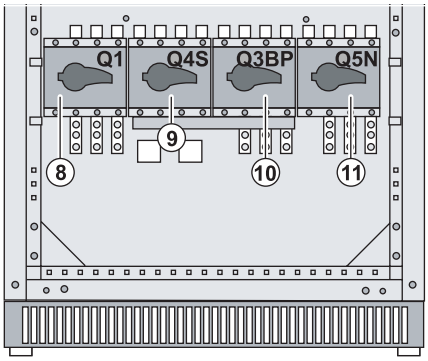
To isolate the UPS from the electrical power source and supply the load directly by the normal or bypass AC source, follow the instructions below.

Figure 4-2: UPS Isolation



1 - Press a button to exit sleep mode.
2 - Shut down the UPS by pressing the OFF button **(38)** for 3 seconds.

The load is no longer protected by the UPS.



3 - Set bypass switch Q3BP **(10)** to ON.
4 - Set output switch Q5N **(11)** to OFF.
5 - Set the battery circuit breaker of the auxiliary cabinets to OFF.
6 - Set the input switch Q1 **(8)** to OFF.
7 - Set the switch Q4S **(9)** to OFF.
8 - Wait until the display and LEDs go off.

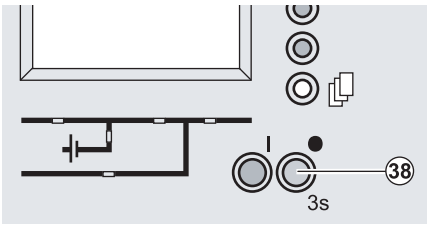
The load is no longer protected by the UPS, but continues to be supplied with AC power.
UPS maintenance or servicing can now be carried out.

ATTENTION **Power is present on the power connection terminals.**

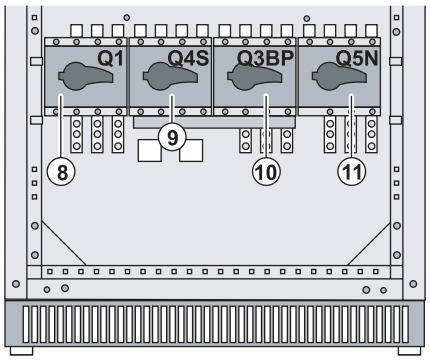
4.3.2 UPS Isolation Parallel UPS Without External Bypass Cabinet

Shutdown and isolation of the first UPS:

Figure 4-3: Parallel UPS Configuration Without External Bypass Cabinet



1 - Check that the two UPSs are operating.
2 - Press a button to exit sleep mode.
3 - Shut down the UPS by pressing the OFF button **(38)** for 3 seconds.



4 - Set output switch Q5N **(11)** to OFF.
5 - Set the battery circuit breakers of the auxiliary cabinets to OFF.
6 - Set the input switch Q1 **(8)** to OFF.
7 - Set the switch Q4S **(9)** to OFF.
8 - Wait until the display and LEDs go off.

The load is still protected by the other UPS.
Maintenance or servicing can now be carried out on the UPS that has been shut down.

ATTENTION **Power is present on the power connection terminals.**

Shutdown and isolation of the second UPS:

1 - Press a button to exit sleep mode.
2 - Shut down the UPS by pressing the OFF button **(38)** for 3 seconds.
3 - Set bypass switch Q3BP **(10)** to ON.
4 - Set output switch Q5N **(11)** to OFF.
5 - Set the battery circuit breaker of the auxiliary cabinets to OFF.
6 - Set the input switch Q1 **(8)** to OFF.
7 - Set the switch Q4S **(9)** to OFF.
8 - Wait until the display and LEDs go off.

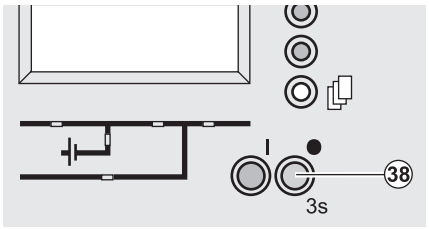
The load is no longer protected by the UPS, but continues to be supplied with AC power.
UPS maintenance or servicing can now be carried out.

ATTENTION **Power is present on the power connection terminals.**

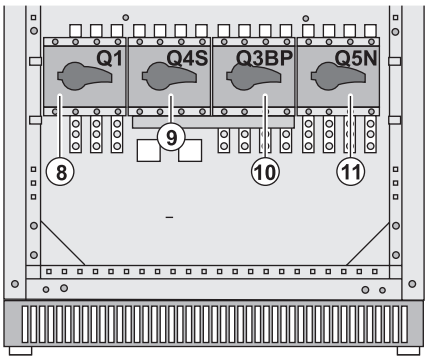
4.3.3 UPS Isolation Parallel UPS With External Bypass Cabinet

Shutdown and isolation of one UPS:

Figure 4-4: Parallel UPS Configuration With External Bypass Cabinet



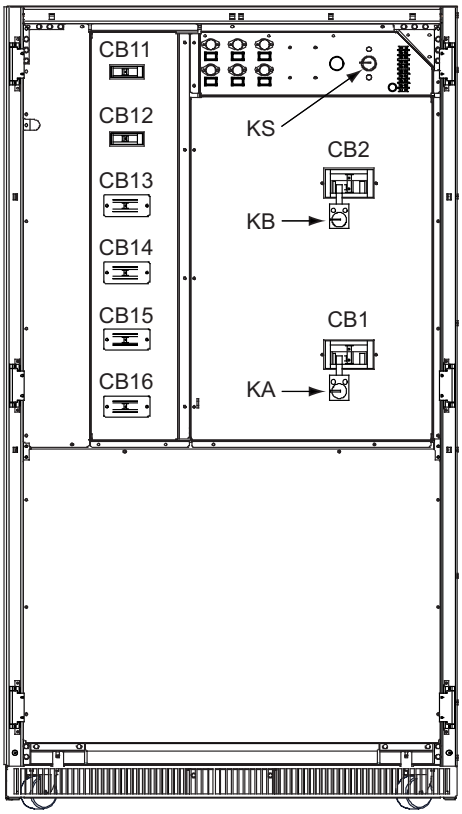
1 - First check that the total capacity of the remaining UPSs is sufficient to supply the connected load.
2 - Press a button to exit sleep mode.
3 - Shut down the UPS by pressing the OFF button **(38)** for 3 seconds.



4 - Set output switch Q5N **(11)** to OFF.
5 - Set the battery circuit breaker of the auxiliary cabinets to OFF.
6 - Set the input switch Q1 **(8)** to OFF.
7 - Set the switch Q4S **(9)** to OFF.
8 - Wait until the display and LEDs go off.

Shutdown and isolation of all the UPSs:

Figure 4-5: Shutdown and Isolation of all the UPSs



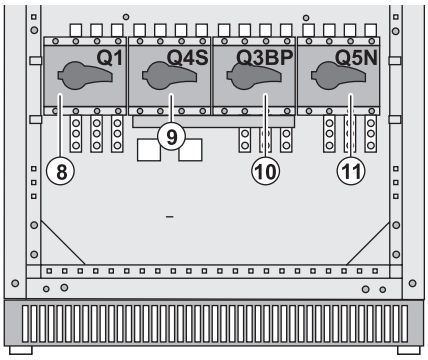
1 - On each UPS, press a button to exit sleep mode.
2 - Shutdown each UPS by pressing their OFF buttons **(38)** for 3 seconds.
3 - Depress the “transfer initiate” switch on the SBC. Unlock “KS” and remove key “A”.
4 - Insert key “A” into CB1. Unlock and close CB1.
5 - Open CB2 and lock open, and remove key “B”.
6 - Insert key “B” into key interlock “KS” and turn to lock.
7 - Open output isolation CB11-16, as applicable, and open all Q5N **(11)** switches of each UPS.
8 - Open battery CB of each UPS.
9 - Open Q1 **(8)** and Q4S **(9)** switches of each UPS.
10 - Turn off all inputs to the UPSs.
11 - Wait until the control electronics of all UPS units have fully shutdown.

The load is no longer protected by the UPSs, but continues to be supplied with AC power.
UPS maintenance or servicing can now be carried out.

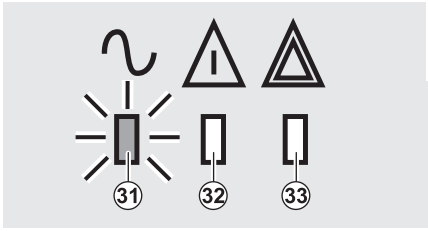
4.4 Return to the Normal Operation

4.4.1 Return to Normal Single UPS

Figure 4-6: Return to the Normal Operation for Single UPS



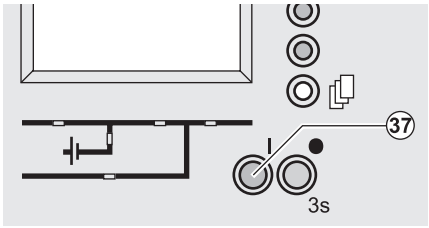
1 - Check that bypass switch Q3BP **(10)** is ON and that all other switches are OFF.
2 - Set switch Q4S **(9)** to ON.
3 - Set output switch Q5N **(11)** to ON.
4 - Wait until the display goes on and check that there are no faults on the static switch on the bypass line.
5 - Set bypass switch Q3BP **(10)** to OFF.
6 - Set the input switch Q1 **(8)** to ON.
7 - Set the battery circuit breaker of auxiliary cabinets to ON.



The UPS starts automatically.
LED (31) is ON.

If LED **(31)** remains OFF, press the ON button **(37)** (the UPS is in manual start mode) and confirm if necessary by pressing the function key **(35)** marked ⏎.

If LED **(31)** still remains OFF and either of LEDs **(32)** or **(33)** is ON, a fault has occurred (see Section 4.1).



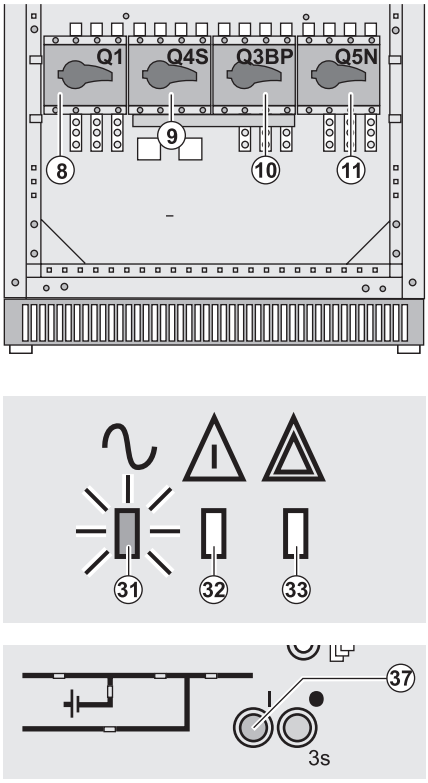
4.4.2 Return to Normal Parallel UPS Without External Bypass Cabinet

Restart the UPS unit for which switch Q3BP (10) is ON and the other switches are OFF.

CAUTION

It is imperative to restart this UPS. Otherwise, load power is lost if the other UPS is shut down.

Figure 4-7: Parallel UPS Configuration Without External Bypass Cabinet



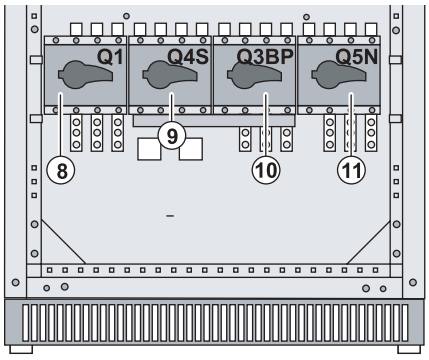
1 - Set the input switch Q4S **(9)** to ON.
2 - Set output switch Q5N **(11)** to ON.
3 - Check that the UPS is listed by the display, then confirm by pressing the function keys **(35)**.
4 - Set bypass switch Q3BP **(10)** to OFF.
5 - Set the input switch Q1 **(8)** to ON.
6 - Set the battery circuit breaker of the auxiliary cabinets to ON.

The UPS starts automatically. LED (31) is ON.
The load is protected by the UPS.

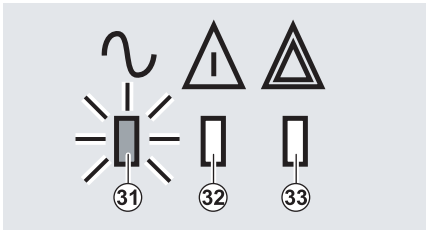
If LED **(31)** remains OFF, press the ON button **(37)** on each UPS (the UPS is in manual start mode) and confirm, if necessary, by pressing the function key **(35)** marked ⏎.

If LED **(31)** still remains OFF and either of LEDs **(32)** or **(33)** is ON, a fault has occurred (See Section 4.1).

Restart the UPS for which all switches are set to OFF.



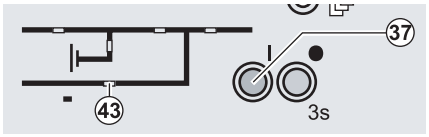
1 - Set the input switch Q4S **(9)** to ON.
2 - Set output switch Q5N **(11)** to ON.
3 - Check that all the UPS units present in the installation are included in the list on the display and confirm by pressing the function buttons **(35)**.
4 - Set the input switch Q1 **(8)** to ON.
5 - Set the battery circuit breaker of the auxiliary cabinets to ON.



The UPS restarts and LED (31) is ON.

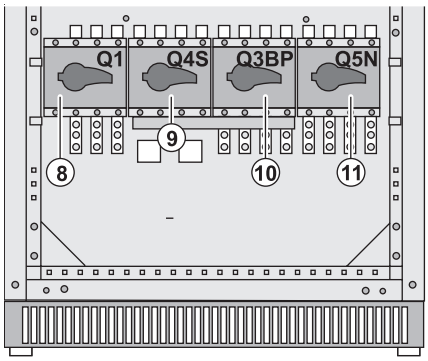
If LED **(31)** remains OFF, press the ON button **(37)** on each UPS (the UPS is in manual start mode) and confirm, if necessary, by pressing the function key **(35)** marked ⏎.

If LED **(31)** still remains OFF and either of LEDs **(32)** or **(33)** is ON, a fault has occurred (see Section 4.1).

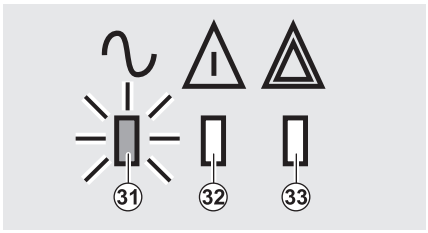


4.4.3 Return to Normal Parallel UPS With External Bypass Cabinet

Figure 4-8: Parallel UPS Configuration With External Bypass Cabinet



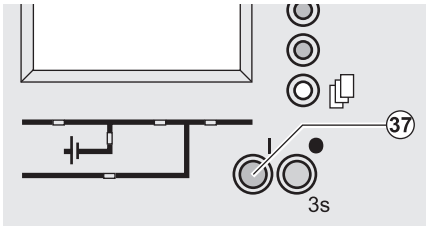
1 - Check that all switches on the UPSs are set to OFF.
2 - Apply bypass and input power to UPSs.
3 - Set switch Q4S **(9)** on each UPS to ON.
4 - Set output switch Q5N **(11)** on each UPS and CB11-CB16, as applicable, to ON.
5 - Check that all the UPSs present in the installation are included in the list on the display and confirm by pressing the function button **(35)** on each UPS.
6 - Set CB2 in the external system bypass cabinet to ON.
7 - Set CB1 in the external system bypass cabinet to OFF.
8 - Set the input switch Q1 **(8)** on each UPS unit to ON.
9 - Set the battery circuit breakers of the auxiliary cabinets to ON.



The UPS units start automatically. LED (31) is ON.
The load is protected by the UPS.

If LED **(31)** remains OFF, press the ON button **(37)** on each UPS unit (the UPS is in manual start mode) and confirm, if necessary, by pressing the function key **(35)** marked ⏎.

If LED **(31)** still remains OFF and either of LEDs **(32)** or **(33)** is ON, a fault has occurred (see Section 4.1).



4.5 Servicing Batteries

IMPORTANT SAFETY INSTRUCTIONS FOR SERVICING BATTERIES

Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

When replacing batteries, use the same model and manufacturer of batteries.

CAUTION

Do not dispose of battery or batteries in a fire. The battery may explode. Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. A battery can present a risk of electrical shock and high short-circuit current.

The following precautions should be observed when working with batteries:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If inadvertently grounded, remove the source of ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if such grounds are removed during installation and maintenance.

4.6 Training Center

To allow you to use Schneider Electric products effectively and carry out basic maintenance, we offer a complete range of technical training courses in English and French.

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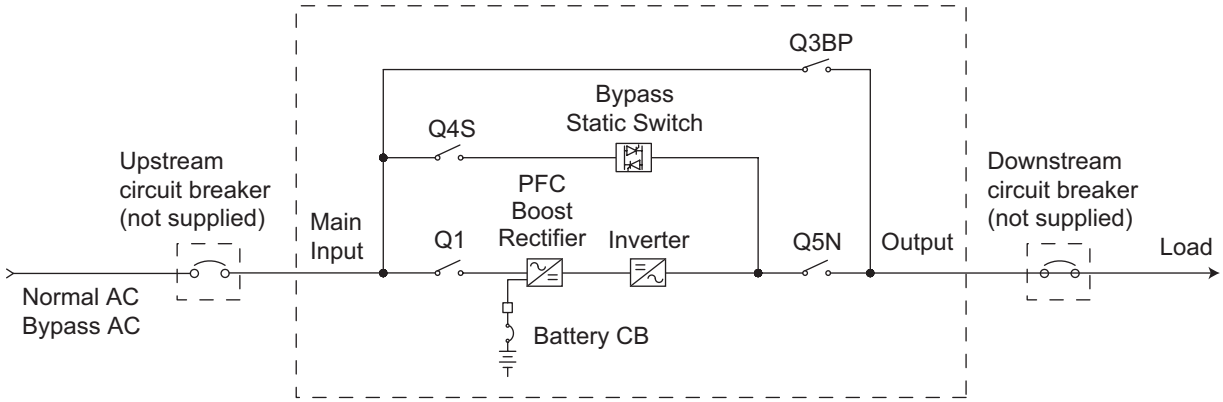
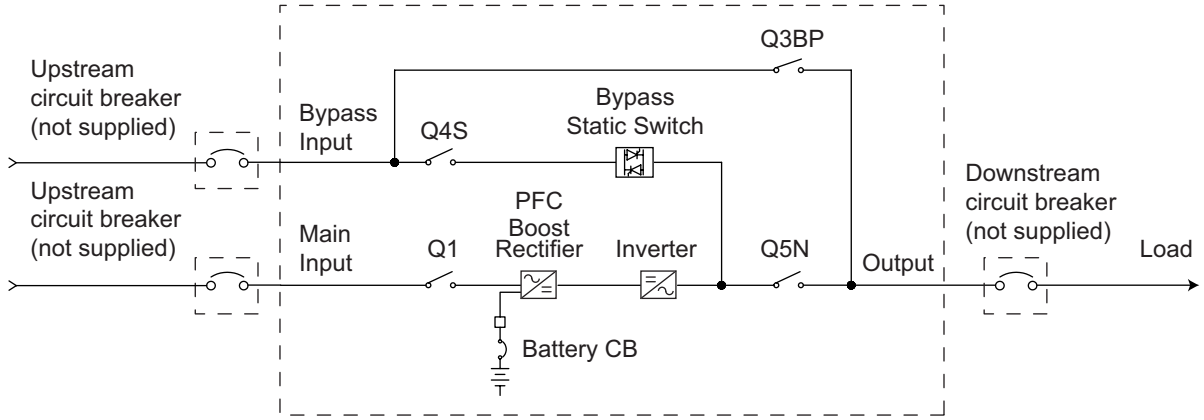
A1 Electrical Characteristics

Selection of Protection Devices

UPS with common normal and bypass AC inputs



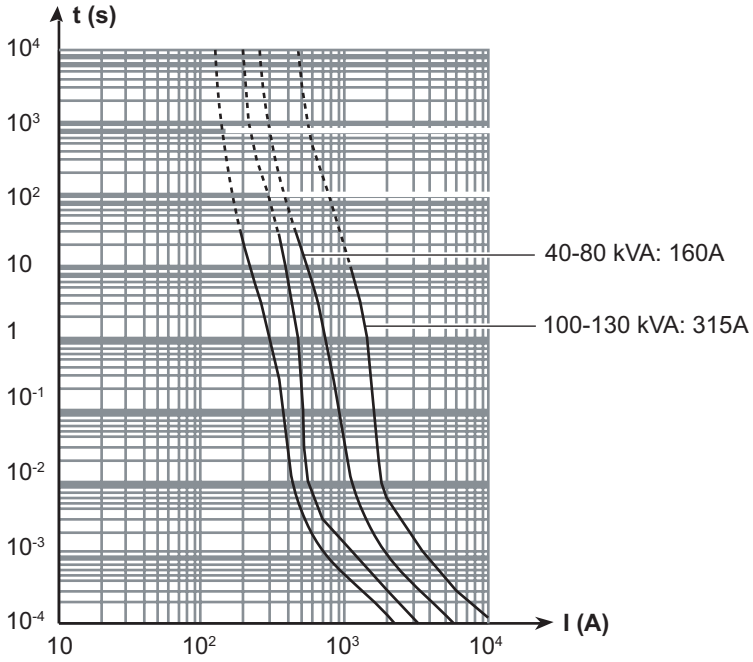
UPS unit with separate normal and bypass AC inputs



NOTE: Interrupted Transfer to Bypass Source:
If the bypass source is beyond the conditions stated below, the UPS will make an interrupted transfer (not more than 100 msec. in duration).

1. Bypass voltage greater than +15%, -15% from the UPS rated output voltage.
2. Bypass frequency greater than ±2 Hz from the UPS rated output frequency.

When sizing the upstream circuit breakers, the parameters presented below must be taken into account:
Time/current curves for UPS input and output fuses:



UPS short-circuit current with inverter coupled and By-pass AC source out of tolerances

Sn	40KVA	50KVA	60KVA	80KVA	100KVA	130KVA
In	48 A	60 A	72 A	96 A	120 A	156 A
Limitation	230 A	230 A	230 A	260 A	435 A	435 A

Line Current Values

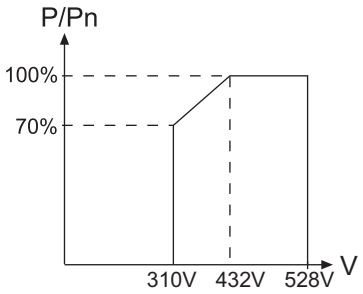
Rated power of each UPS unit	**Continuous input current at V=480V**	**Input current at V=480V overload = 1.25 In limited to 10 min.**	**Input current at V=480V overload = 1.5 In limited to 1 min.**	**Input/output fuse ratings**
40KVA	48 A	60 A	72 A	160 A
50KVA	60 A	75 A	90 A	160 A
60KVA	72 A	90 A	108 A	160 A
80KVA	96 A	120 A	144 A	160 A
100KVA	120 A	150 A	180 A	315 A
130KVA	156 A	195 A	234 A	315 A

Input/Output Characteristics

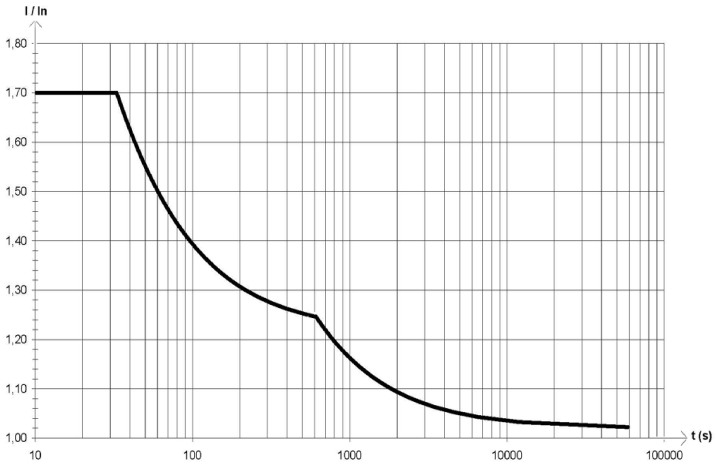
Normal AC source/Bypass AC source

	UPS
Uin	432 to 528 V
Input voltage range permitted by the standard according to the curve below	310 to 528 V
Fin	45 to 65 Hz

Power supplied as a function of input voltage



Permissible UPS overloads as a function of time



General characteristics of Galaxy 5000 UPSs

UPS power in KVA	40	50	60	80	100	130
Normal AC input						
Number of conductors	3 phases + ground					
Reference voltage at Pn	432 V to 528 V					
Reference frequency	45 Hz to 65 Hz					
THDI	Typically 3% at Pn					
Power factor	>0.99					
Bypass AC input						
Number of conductors	3 phases + ground					
Reference voltage at Pn	432 V to 528 V					
Reference frequency	45 Hz to 65 Hz					
Load output						
Number of conductors	3 phases					
Set phase-to-phase voltages	480 V					
Voltage variation	± 1%					
Adjustable frequencies and tolerance (on battery power)	60 Hz ± 0.1 Hz					
Voltage variation for 0 to 100% load step change	± 1%					
Permissible overloads	150% for 1 minute, 125% for 10 minutes					
THDU Ph-to-Ph and Ph-to-N for nonlinear load	< 2% Ph-to-Ph					
Battery						
Standard battery technology	Sealed lead-acid battery (gas-recombination)					
Inverter						
Active power (kW)	36	45	54	72	90	117
Heat losses in kW Heat Heat losses in BTUs	2.71 9250	3.39 11560	4.06 13870	5.42 18500	5.74 19610	7.47 25490
Storage temperature range	-13°F to 103°F (-25°C to +45°C)					
Relative humidity	20% to 95%					
Maximum operating altitude without derating	3281 ft (< 1000 m)					
Operating temperature range at Pn	32°F to 104°F (0°C to 40°C)					

INFORMATION **The operating temperature range is 32°F to 104°F (0°C to +40°C); for overload conditions is 32°F to 86°F (0°C to +30°C). Optimum operating range is within 68°F to 77°F (20°C to +25°C). Battery backup time is adversely affected by high and low temperatures. It is significantly reduced at temperatures under 50°F (10°C). Above 77°F (25°C), battery service life is cut in half every 18°F (10°C). Above 104°F (40°C), battery manufacturers no longer guarantee operation due to the risk of thermal runaway.**

A2 Maximum Allowable Power for Parallel UPS Units

Without external system bypass cabinet:


= 1 x Pn


+

= 1 x Pn

With external system bypass cabinet:


+

= 2 x Pn


+

+

= 3 x Pn


+

+

+

= 4 x Pn


+

+

+

+

= 5 x Pn


+

+

+

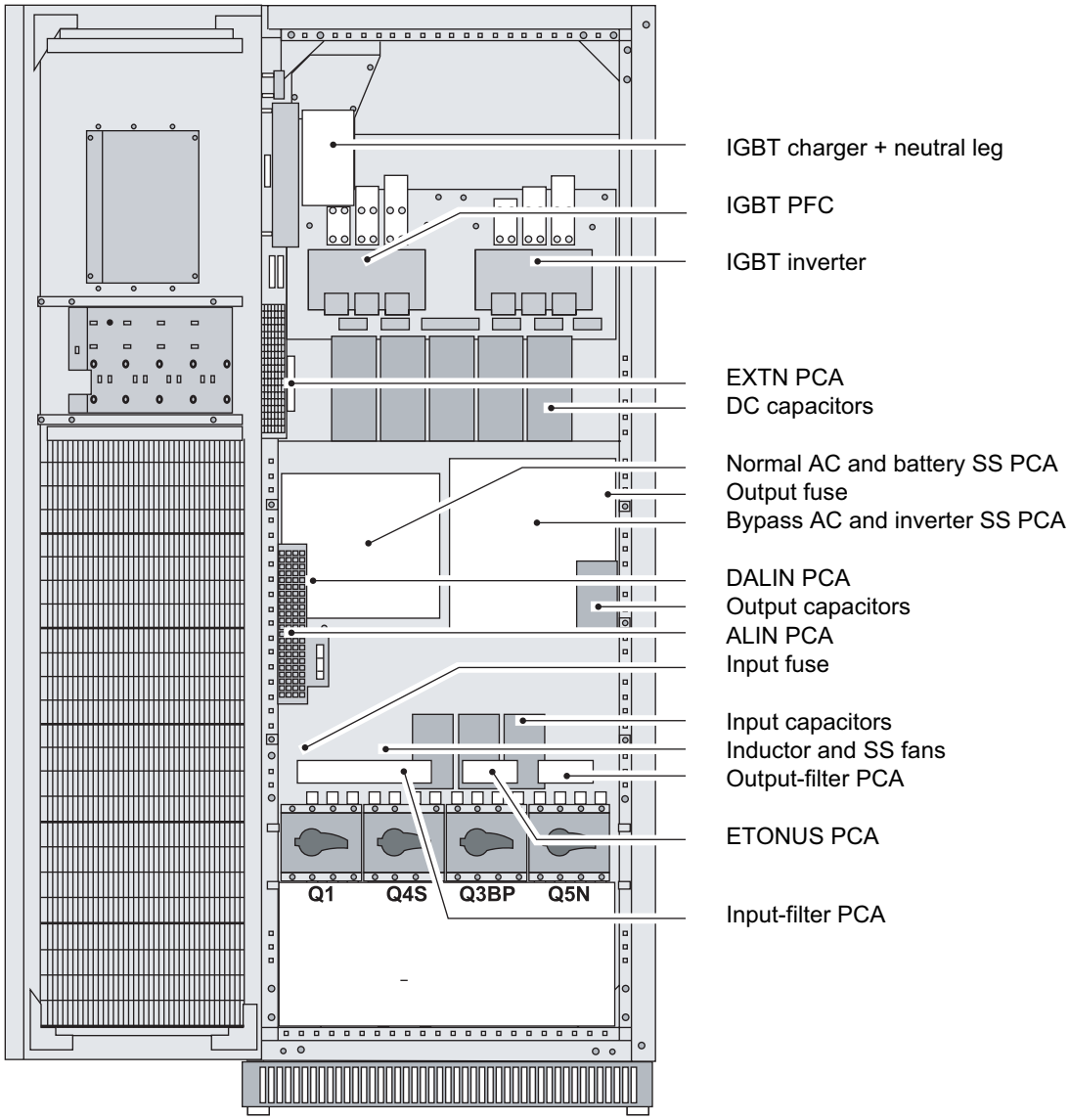
+

+

= 5 x Pn

INFORMATION **The maximum allowable power for 6 parallel UPSs is limited to 5 x Pn for 40-80kVA UPSs. For 100-130kVA UPSs, the maximum is up to 4 x Pn.**

A3 UPS Cabinet Major Internal Components



A4 Available Options

NMC (Network Management Card) option

This option is a communications card for supervision and protection of a three-phase device. Each UPS can be equipped with a maximum of four NMC communications cards.

Optional communications card with additional power relay

The UPS is already equipped with a relay communications card. But it is possible, with this option, to add another card with programmable power-relay functions.

Optional serial communications card

This option is an RS232 or RS485 serial communications card operating under the JBUS protocol.

AS4I option

This option consists of a low-power relay card for shut-off and scheduling functions.

Multislot option

This option consists of communications cards to concentrate the communication of two parallel-connected UPSs.

External synchronization module option

With this option, a SYNIN communications card and two circuit breakers are added to each UPS unit. The external synchronization module issues a reference frequency used to synchronize the UPS units.

CAUTION

Check the different input/output signal levels (LV, ELV, SELV) on the optional communication cards (4) and use appropriate wiring.

A5 Environment

Schneider Electric has implemented an environmental-protection policy.
Products are developed according to an eco-design approach.

Substances

This product does not contain CFCs, HCFCs or asbestos.

Packing

To improve waste treatment and facilitate recycling, separate the various packing components.
The cardboard we use includes over 50% of recycled cardboard.
Sacks and bags are made of polyethylene.
Packing materials are recyclable and bear the appropriate identification symbol 

.

Material	Abbreviation	Symbol Number 
Polyethylene terephthalate	PET	01
High-density polyethylene	HDPE	02
Polyvinyl chloride	PVC	03
Low-density polyethylene	LDPE	04
Polypropylene	PP	05
Polystyrene	PS	06

Follow all local regulations for the disposal of packing materials.

End of life

Schneider Electric will process products at the end of their service life in compliance with local regulations.
Schneider Electric works with companies in charge of collecting and eliminating our products at the end of their service life.

Product

The product is made up of recyclable materials.
Dismantling and destruction must take place in compliance with all local regulations concerning waste.
At the end of its service life, the product must be transported to a processing center for electrical and electronic waste.
Make the product unusable by cutting the internal supply cables.

Battery

The product contains lead-acid batteries that must be processed according to applicable local regulations concerning batteries.
The battery may be removed to comply with regulations and in view of correct disposal.
The "Material Safety Data Sheets" (MSDS) for the batteries are available on our web site*.

(*) For more information or to contact the Product Environmental manager, use the "Environmental Form" on the site: www.mgeups.com -> About us -> Environment.

MGE Warranty & Proprietary Rights Statement for Three Phase Products

(Applicable within the United States, Canada and Mexico)

MGE Standard Three Phase Warranty

MGE UPS SYSTEMS, INC. (“MGE”) warrants three phase products it manufactures to be free from defects in materials and workmanship for a period of three hundred sixty five (365) days counting from the date of purchase by or for the first end user (“Purchaser”), or, if applicable, the date of MGE’s completion of initial startup of the subject product, provided however said warranty shall not exceed eighteen (18) months from the date of delivery of the subject product to Purchaser (the “Warranty Period”). MGE’s liability hereunder is limited to replacing or repairing at MGE’s factory or on the job site, at MGE’s option, any part or parts that are defective and reported to MGE during the Warranty Period. MGE shall have the sole right to determine if the parts are to be repaired at the job site or whether they are to be returned to the factory for repair or replacement. All items returned to MGE for repair or replacement must be sent freight prepaid to its factory. Purchaser must obtain MGE’s Return Goods Authorization (“RGA”) prior to returning items. The conditions stated herein must be met for MGE’s warranty to be valid. MGE will not be liable for any damage done by unauthorized repair work, unauthorized replacement parts, from any misapplication of the subject product, for damage due to accident, abuse, or act of God (such as earthquake, flood, inclement weather, rain or fire), or relating to Purchaser’s failure to follow proper environmental conditions for the product.

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This warranty shall be exclusive of any and all other warranties express or implied and may be modified only by a writing signed by an authorized officer of MGE UPS SYSTEMS, INC. This warranty shall extend to the Purchaser but to no one else. Accessories supplied by MGE, but manufactured by others, carry any warranty the manufacturers have made to MGE, and which can be passed on to Purchaser.

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Purchaser has not relied and shall not rely on any oral representation regarding any products sold hereunder and any oral representation shall not bind MGE UPS SYSTEMS, INC. and shall not be part of any warranty.

There are no warranties which extend beyond the description on the face hereof. In no event shall MGE UPS SYSTEMS, INC. be responsible for consequential damages or for any other damages except as expressly stated herein.

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For Three Phase Warranty outside of the United States, Canada and Mexico, refer to Three Phase International Warranty.

January 2005 Rev C00

Warranty and Product Registration

Thank you for choosing MGE UPS SYSTEMS, INC. for your power protection, distribution, and quality requirements. We are pleased to have you join our increasing family of users.

In order to maximize the value you receive from this product, and to ensure that you are kept informed of product or software updates, we recommend that you take a few minutes to register your new purchase. You may register online at the URL noted below. Should you not have Internet access, you may mail or fax this form back (attn: Warranty Registration) as indicated at the bottom of the page.

Register your product at: http://www.mgeups.com/email/warranty/menu.htm

Please be prepared with the following information to register and validate your product's warranty, keep informed on software and product updates, and register your extension "Warranty+" if purchased with the product.

User Information

Last name _____

First name _____

Company name _____

Address _____

Zip code _____

City _____

State/Province _____

Country _____

Tel _____

Fax _____

Email _____

Product Information

Model _____

Serial Number _____

Date of purchase _____

Warranty Extension (Warranty+)

I have purchased a warranty extension (Warranty+)

Reference: _____Contract Number: _____

Thank you from all of us at MGE.

MGE UPS SYSTEMS, INC., 1660 Scenic Avenue, Costa Mesa, CA 92626, USA
Tel: 714-557-1636 Fax: 714-557-9788

41-000154-53 Rev B02 8/2005

Service Solutions Team — Three Phase Products

Technical Support and Product Services

Technical questions? If you encounter a problem while following the instructions in this manual, or have questions about the operation, repair, or servicing of your equipment, please direct calls to the Service Solutions Team or visit our web site www.mgeups.com for complete service information.

To insure that your questions are correctly answered, please obtain the serial number of the unit and include them in any discussions or correspondence.

Serial number: _____

Who To Contact

Service Solutions Team: **1-800-438-7373** (Hours: 24/7)

Customer FAQ
or International calls: **1-714-557-1636**

Commitment: We are committed to providing easy access to factory trained experts that will provide responses to any questions that you might have.

Scheduling Field Service Engineer Support

Scheduling of the Schneider Electric Field Service Engineers typically should be done 7 to 10 days before they are required on-site. If the startup of the product is critical to maintaining your schedule, please call the Schneider Electric toll free telephone number at **1-800-438-7373** for assistance.

Return Policy for Repair of Three Phase Products (RGA)

Should you require factory service for your equipment, contact Schneider Electric Service Solutions Team and obtain a Return Goods Authorization (RGA) prior to shipping your unit. Never ship equipment to Schneider Electric without first obtaining an RGA number.

Date: _____

RGA Number: _____

Contact Name: _____

Website service address http://www.mgeups.com/products/pdt120/service/ccc.htm

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Glossary

Term used	Definition/Meaning
@	At.
/	And/or.
+/-	Plus or Minus.
≤	Equal to or less than.
#	Number.
°C	Degree Celsius.
°F	Degree Fahrenheit.
Ø	Phase angle.
Ω	Ohm; unit of resistance.
®	Trade Mark.
AC or ac	Alternating current, also implies root-mean-square (rms).
Ambient Temp.	Temperature of surrounding air.
Ambient noise	Acoustical noise of surrounding environment.
ANSI	American National Standard Institute.
AWG	American Wire Gauge. A standard unit for measuring wire cross-sectional area.
BTU or Btu	British thermal unit. Defined as the amount of heat required to raise the temperature of one pound of water by 1°F.
BYPASS mode	Load is powered by the bypass input line through the static switch.
CB	Circuit breaker.
DC or dc	Direct current, or voltage.
Earth ground	A ground circuit that has contact with the earth.
GND	Electrical ground.
Hz	Hertz, frequency measurement unit, 1Hz is one cycle per second.
I	Current.
In	Nominal current.
IEC	International Electrotechnical Commission.

IEEE	Institute of Electrical and Electronic Engineers.
Inverter	An electrical circuit that generates an AC voltage source from a DC voltage source.
IGBT	Insulated gate bipolar transistors.
I/O	Input/Output.
KVA	KiloVolt-Ampere; is equal to 1000 Volt-Ampere.
KW	True power. Kilo-Watt = 1000 Watt.
L	Line.
LCD	Liquid-Crystal Display.
LED	Light Emitting Diode.
Mains or Mains 1	Main AC input source.
Mains 2	Bypass AC input source.
mA	Milliampere.
MAX.	Maximum.
N	Neutral.
NC	Normally closed.
NO	Normally open.
NEC	National Electrical Code.
NFPA	National Fire Protection Association.
PN	Part number.
Pn	Nominal power.
On-line mode	Inverter output power is the primary energy source to load.
OSHA	Occupational Safety and Health Agency.
PCA	Printed circuit assembly.
PCB	Printed circuit board.
PWM	Pulse Width Modulation.
Q1	UPS input isolation switch.
Q3BP	UPS maintenance bypass switch.
Q4S	UPS bypass switch.
Q5N	UPS output switch.
Remote Emergency Power Off	A switch used for shutting down electrical equipment from a location away from the equipment.
REPO	Remote Emergency Power Off.

SCR	Silicon controlled rectifier.
Static Transfer	A solid state switching mechanism electronically controlled to pass AC power directly from the utility to an output load.
Test connector	DB-9 type connector on the LCD panel allowing MGE UPS SYSTEMS Customer Support Service technician to access programmable and diagnostic features of the system.
UL	Underwriter's Laboratories, Inc.
V	Volts
VA	Volt-amperes, unit for apparent power measurement, equal V x I.
VAC	Voltage of AC type.
Vdc	Voltage of DC type.

Reorder Form

1660 Scenic Avenue
Costa Mesa, CA 92626

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NAME _____

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I would like to order_____ (quantity @ $75.00 each) additional copies of the:

MGE Galaxy 5000
40 – 130KVA
Installation and User Manual

86-174010-00 B00

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(800) 523-0142

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