UPS OPERATING MANUAL

INFINITY 3100 – INFINITY 3300

WARNING: This is a Class A-UPS Product. In a domestic environment, this product may cause radio interference, in wich case, the user may be required to take additional measures.

UPS OPERATING MANUAL

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1. INTRODUCTION

Congratulation for the choice of an Astrid Energy Enterprises product for the safety of your devices. To use at the best the performances of your INFINITY UPS we suggest you to read with attention the present manual.

The scope of this manual is to describe briefly the parts that constitute the UPS and to guide the installer and the user to the correct installation of the system in the chosen room.

The installer and the user will have to read this manual with care and attention and correctly carry-out the instructions provided, especially those relevant to security according to the country standards in force.

WARNING

THE UPS CAN BE INSTALLED BY QUALIFIED PERSONNEL ONLY. THE UPS CAN BE OPERATED BY EXPERIENCED PERSONNEL.

1.1 ENVIRONMENT

1.1.1 ISO 14001 certification

Astrid Energy Enterprises pays particularly attention at environmental impact of its products; for this reason development of INFINITY UPS is carried out with an ecological approach in compliance of ISO 14001 certificate.

1.1.2 Packing

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

1.1.3 Lead battery

This product contains lead-acid batteries. Lead is a dangerous substance for the environment if it is not correctly recycled by specialised companies.

1.1.4 Treatment of UPS at the end of life cycle

For the UPS disposal at the end of its life cycle and for the recycling of the materials, it's strongly recommended to follow the regulations in force in the country of installation.

1.2 SAFETY RULES

1.2.1 Safety of persons

The UPS must be installed in a room with restricted access (qualified personnel only, according to standard EN62040-1-2).

A UPS has its own internal power source (the battery). Consequently, the power outlets may be energised even if the UPS is disconnected from the AC-power source.

CAUTION

If primary powers isolators are installed in other area from UPS area.
You must stick the following warning label on them.
"ISOLATE UNINTERRUPTIBLE POWER SUPPLY (UPS) BEFORE WORKING ON THIS CIRCUIT"

Dangerous voltage levels are present within the UPS. It should be opened exclusively by qualified service personnel.

Warning, after the UPS shut-down, a dangerous voltage will be present on the battery selector BCB.

The UPS must be properly earthed.

The battery supplied with the UPS contains small amounts of toxic materials. To avoid accidents, the directives listed 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.

1.2.2 Product safety

A protection circuit breaker must be installed upstream 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.

1.2.3 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 -10° C to +45° C.

If the UPS remains de-energised for a long period, we recommend that you energise the UPS for a period of 24 hours, at least once every month. This charges the battery, thus avoiding possible irreversible damage.

The UPS is designed for normal climatic and environmental operating conditions as defined in the "appendices" chapter: 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 its integrated 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.

The UPS must always be installed in compliance with:

- **the requirements of HD 384.4.42 S1/A2 - Chapter 42: Protection from thermal effects.**

- **standard IEC 60364-4-482 - Chapter 482: Fire protection.**

The manufacturer declines all responsibility for damages to people or equipment deriving from non-fulfilment of the above.

2. UPS GENERAL DESCRIPTION

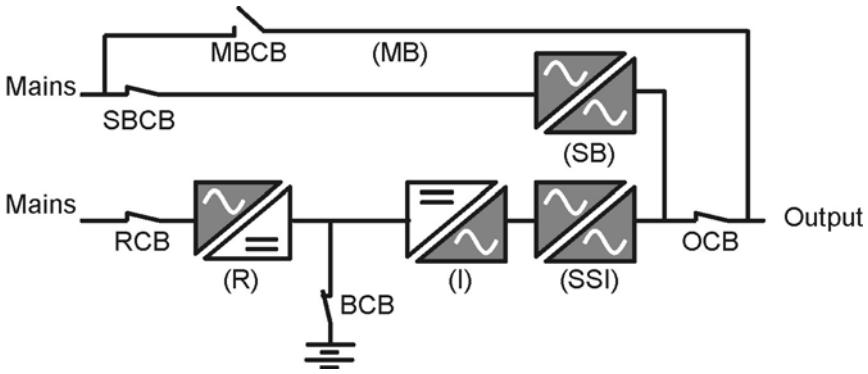
2.1 TYPOLOGY

All UPS covered by this manual are on-line, double conversion; the inverter supplies always energy to the load, whether mains is available or not (according to the battery autonomy time).

WARNING

The UPS output is energized even during mains failure, therefore in compliance with the prescriptions of EN 62040-1, the installer will have to identify the line or the plugs supplied by the UPS making the User aware of this fact.

This configuration guarantees the best service to the User, as it supplies clean continuously regulated power and guarantees the voltage and frequency will be stabilised at nominal value independently from mains status. Thanks to the double conversion, it makes the load completely immune from micro-interruptions due to excessive mains variation, and prevents damage to the critical load (Computer - Instrumentation - Scientific equipment etc.).



Picture 1 – Block diagram

2.2 SYSTEM DESCRIPTION

2.2.1 Rectifier

It converts the three phase voltage of the mains into continuous DC voltage.

It uses a three phase - low harmonics - fully-controlled IGBT's bridge.

It's designed to supply the inverter at full load and the battery at the maximum recharging current. This configuration is used to reduce the distortion of the current absorbed from the mains (THD) to a value <5%.

This ensures that the rectifier does not distort the supply mains, with regard to the other loads; it also avoids the overheating of the cables due to the harmonics circulation.

2.2.2 Inverter

It converts the continuous voltage coming from the rectifier or from the battery into alternating voltage stabilized in amplitude and frequency.

The inverter uses IGBT technology with a frequency commutation of approximately 15 KHz.

The control electronics is completely digital and uses a 32 Bit μP, that, by the means of its processing capability, generates an excellent output sine-wave, which has a very low distortion even in presence of loads having high crest factor currents.

2.2.3 Battery and battery charger

The battery is housed inside the UPS (only for INFINITY 10-15-20kVA) and in an external battery cabinet for higher battery ratings.

The battery charger control logic is completely integrated inside the rectifier control board; the battery is charged, according to the DIN 41773 Standard, every time it has been partially or completely discharged and it is kept floating, even when it's charged, to compensate for any autodischarge.

2.2.4 Static bypass

It's designed to transfer the load between INVERTER and MAINS, and vice-versa, without break, and uses SCR's as power commutation elements.

2.2.5 Manual bypass

It's used to by-pass the UPS, supplying the load directly to the mains in case of maintenance or serious failure.

WARNING

The sequence of bypass switching must be carried out with respect to the procedure indicated on the UPS and in the chapter "Start-up, shut-down and manual bypass". The manufacturer cannot accept responsibility for damages arising from incorrect operation.

2.2.6 Front panel

The front panel of the UPS, consisting of a four row alphanumeric displays plus 5 function keys, allows the complete monitoring of the UPS status.

The mimic diagram helps to understand the operating status of the UPS.

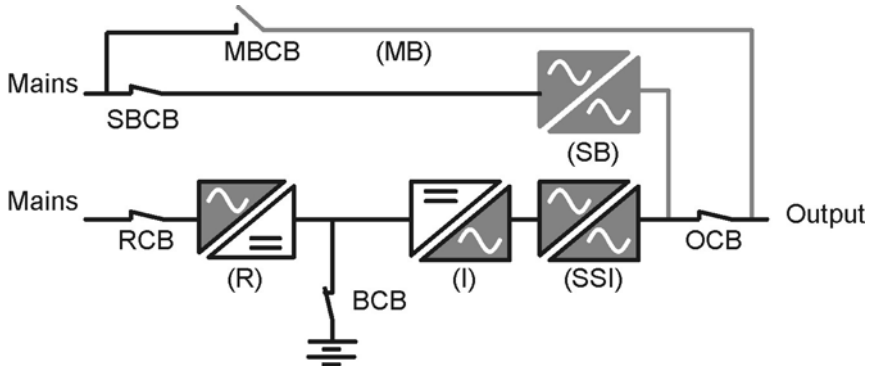
For more information see the chapter “FRONT PANEL”.

2.3 OPERATING STATUS

The following paragraphs show all the possible operating status of the UPS.

2.3.1 Normal operation

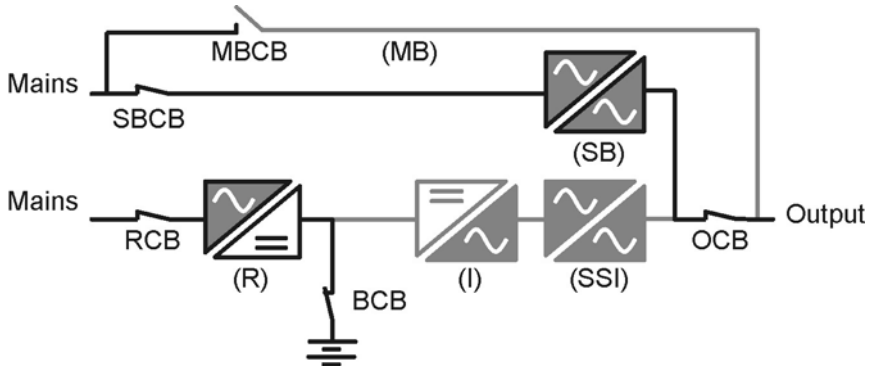
The inverter is supplied by the rectifier; the load, through the static switch, is supplied directly by the inverter output.



Picture 2 – Normal operation

2.3.2 Load supplied by bypass due to inverter fault

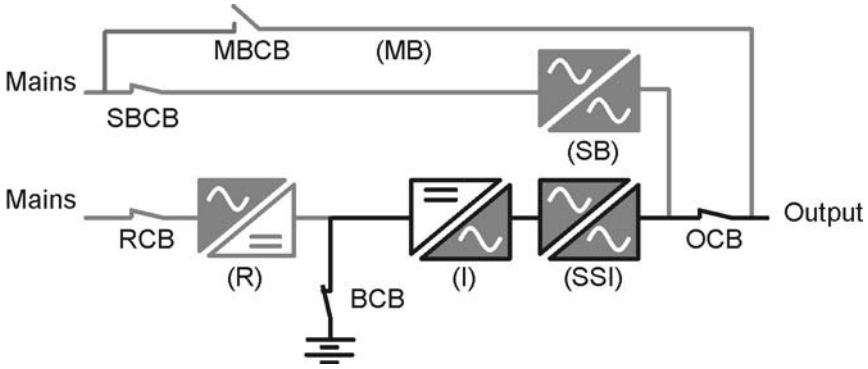
The load is transferred to bypass through the static switch; the transfer is carried out without interruption.



Picture 3 – Load supplied by bypass

2.3.3 Rectifier failure or mains failure

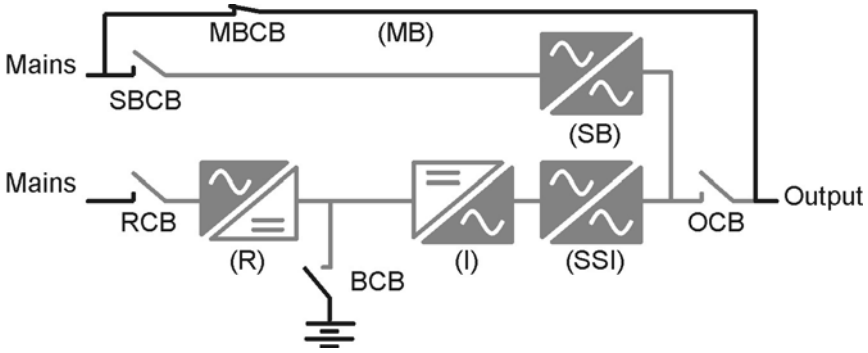
The inverter is supplied by the battery for the required autonomy time; the load, through the static switch, is supplied directly by the inverter output.



Picture 4 – Rectifier failure or mains failure

2.3.4 Manual bypass

The load is supplied by the mains through the manual bypass; the operator can work in safety on the UPS to carry out maintenance or repairing operations.



Picture 5 – Manual bypass

3. INSTALLATION

3.1 RECEIPT OF THE UPS

When the UPS is received, please attend immediately to its unpacking and carry-out an accurate visual check to be sure that the equipment has not been damaged during transport.

IMPORTANT

In case of objections relating to damage incurred during transport these must be immediately notified to the transportation company after receipt of the equipment.

When the UPS is not installed immediately it must be stored carefully in vertical position, as indicated on the packing and conserved in a dry and sheltered room in its box so that it is protected from dust.

3.2 HANDLING OF THE UPS

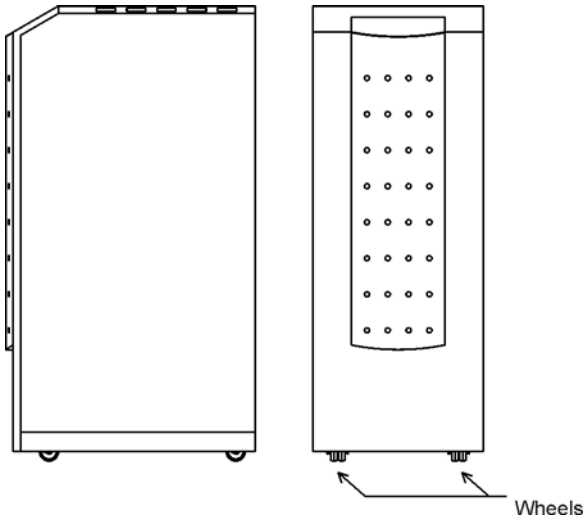
Before positioning the UPS, in order to avoid risks of turnover, it's recommended to move the system on the wood pallet on which the UPS is fixed.

Before the positioning in the final location, remove the UPS from the pallet.

The UPS can be lifted and handled using a pallet truck or a forklift.

- UPS up to 40 kVA

The UPS's up to 40 kVA (INFINITY 3100 and 3300 series) can be handled by means of the four wheels fixed on the bottom. The UPS technical data are shown on a label fixed on the rear.



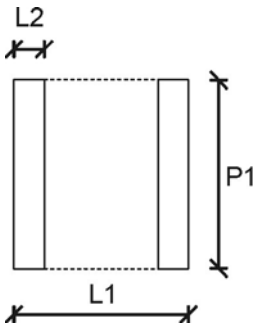
Picture 6 – Handling of UPS up to 40 kVA

3.3 POSITIONING AND INSTALLATION

The UPS must be installed in a clean and dry room, preferably not dusty. The User must ensure that there is enough air exchange in the room so that the equipment can be adequately cooled; if this is not guaranteed, the room must be adequately aired.

If the UPS contains the batteries internally (INFINITY 10-15-20kVA) the air exchange with the external ambient will have to be according to EN 62040 -1, annex N.

3.3.1 Base plan, static load and weights



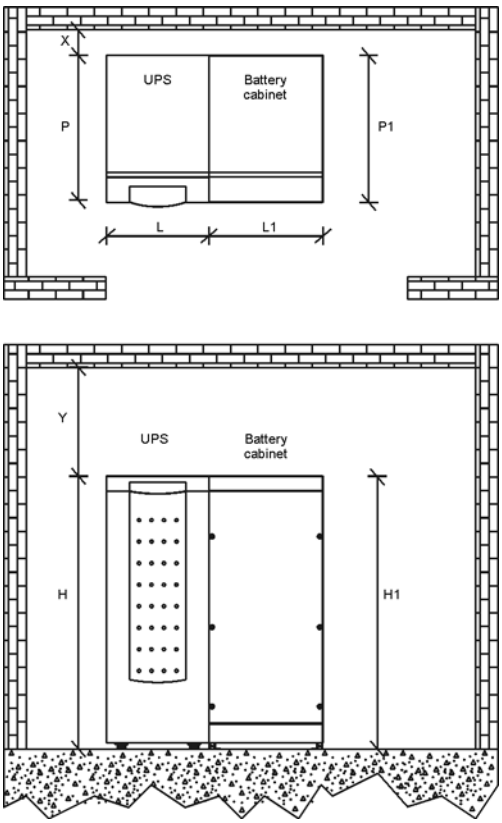
Picture 7 – Base plan

UPS (kVA) INFINITY	10	15	20	30	40
	3100/3300				
L1 – mm	450				
P1 – mm	650				
L2 – mm	-				

INFINITY 3100 (kVA)	10	15	20
Weight w/o battery – kg	90	100	100
Weight with battery – kg	250	260	260
Static load – kg/m^2	840	890	890

INFINITY 3300 (kVA)	10	15	20	30	40
Weight w/o battery – kg	90	100	100	141	141
Weight with battery – kg	250	260	260	-	-
Static load – kg/m^2	840	890	890	483	483

3.3.2 Dimensions and distances



Picture 8 – Dimensions and distances from the walls

UPS (kVA)	10	15	20	30	40
	3100/3300			3300	
L – mm	450				
P – mm	650				
H – mm	1200				
X (min.) – mm	50			100	
Y (min.) – mm	500				
ADD. CABINET	**AS553**				
L1 – mm	500				
P1 – mm	650				
H1 – mm	1200				

3.4 ELECTRICAL CONNECTION

The electrical connection is part of the work which is normally provided by the supplier that carries out the electrical installation and not by the UPS manufacturer. For this reason, the following recommendations are only an indication, as the UPS manufacturer is not responsible for the electrical installation.

In any case we recommend to carry-out the installation and the electrical connections of the input and output in compliance with the local standards.

During the electrical installation take particular care to check the phase rotation with a suitable instrument.

- UPS up to 20 kVA

The terminal boards are placed on the rear of the UPS, under the breakers. To access the terminals remove the protection, removing the fixing bolts.

- UPS 30-40 kVA

The terminal boards are placed on the front of the UPS. To access the terminals remove the front panel, removing the fixing bolts.

WARNING

The connection to the mains must be carried out with protection fuses between the mains and the UPS.

The use of residual current devices in the line supplying the UPS is unadvisable. The leakage current due to the RFI filters is rather high and it can cause spurious tripping of the protection device.

According to the EN62040-1 standard, in order to take into account the UPS' leakage current, residual current devices having adjustable threshold can be used.

INCLUDE AN APPROPRIATE AND READLY ACCESSIBLE DISCONNECT DEVICE IN THE FIXING WIRE CONNECTING THE UPS TO THE MAINS

To protect the output against electrical shock, use the following residual current devices:

INFINITY 3300: DEVICE AS TYPE B (IEC/TR 60755/A2)

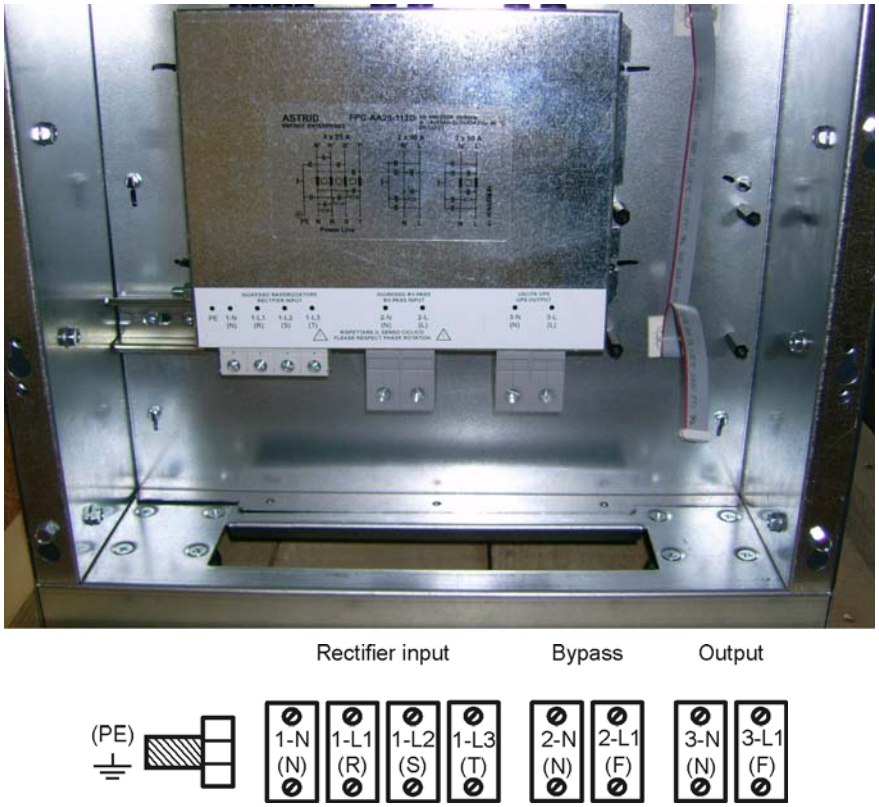
INFINITY 3100: DEVICE AS TYPE A (IEC 61081-1 or IEC 61091-1)

The connection cables section is shown in the following tables.

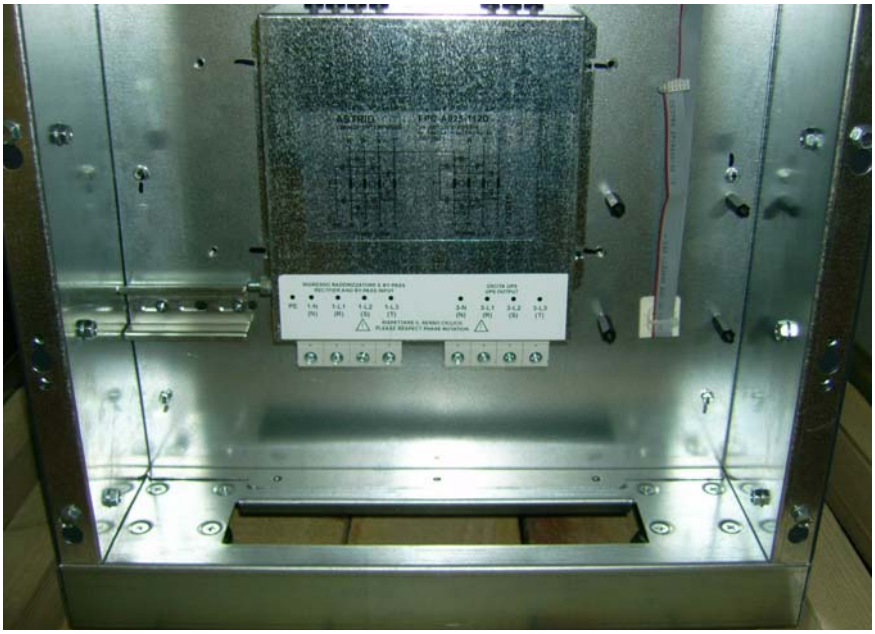
INFINITY 3100 UPS (kVA)		10	15	20
Input fuses (A)	Rectifier	3x25	3x32	3x32
	Bypass	1x80	1x110	1x150
Input cables (mm^2)	Rectifier	3x6	3x10	3x10
	Bypass	2x16	2x25	2x35
Output cables (mm^2)		2x16	2x25	2x35
Battery cables (mm^2)		3x6	3x6	3x6

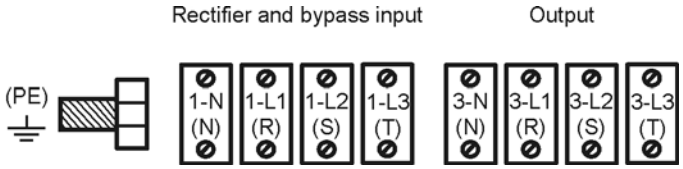
INFINITY 3300 UPS (kVA)		10	15	20	30	40
Input fuses (A)	Rectifier	3x25	3x32	3x32	3x70	3x70
	Bypass	-	-	-	-	-
Input cables (mm^2)	Rectifier	4x6	4x6	4x10	4x25	4x25
	Bypass	-	-	-	-	-
Output cables (mm^2)		4x6	4x6	4x10	4x25	4x25
Battery cables (mm^2)		3x6	3x6	3x6	3x16	3x16

3.4.1 Terminal board

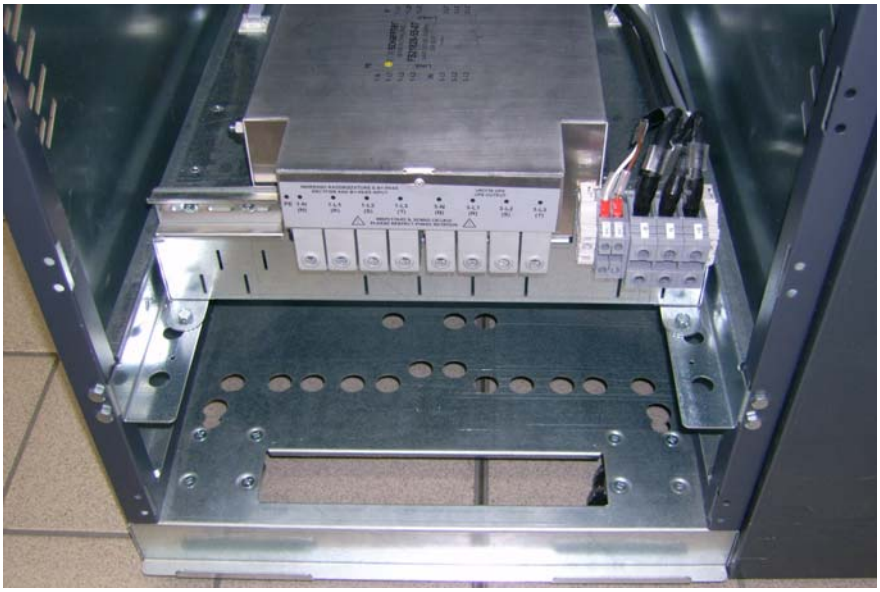


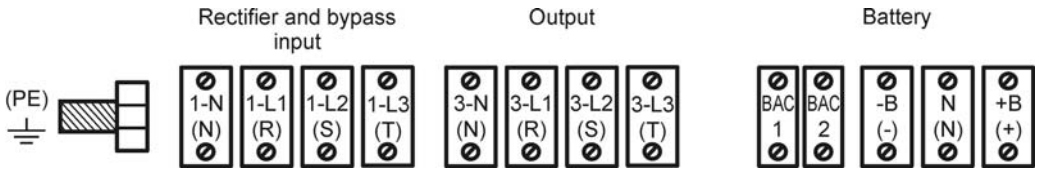
Picture 9 – Terminal board INFINITY 3100 10-15-20kVA





Picture 10 – Terminal board INFINITY 3300 10-15-20kVA





Picture 11 – Terminal board INFINITY 3300 30-40kVA

3.5 BATTERY

IMPORTANT

For battery installation please respect the prescriptions of the EN62040-1 standard, paragraph 4.5.

To obtain the battery life indicated by the battery manufacturer, the operating temperature must remain between 0 and 25 °C. However, although the battery can operate up to 40 °C , there will be a significant reduction of the battery life.

To avoid the formation of any kind of potentially explosive hydrogen and oxygen mixture, suitable ventilation must be provided where the battery are installed (see EN62040-1 annex N).

The batteries can be internal or external, however, it is recommended to install them when the UPS is capable of charging them. Please remember that, if the battery is not charged for periods over 2-3 months they can be subject to irreparable damage.

IMPORTANT

The infinity 3100 and 3300 from 10 kVA to 20 kVA, have internal batteries.

Servicing of batteries should performed by qualified personnel only.

Replace the batteries with the same number of block and capacity.

Replace only with original type.

CAUTION: do not dispose of batteries in fire. The battery may explode.

CAUTION: do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes.It may be toxic.

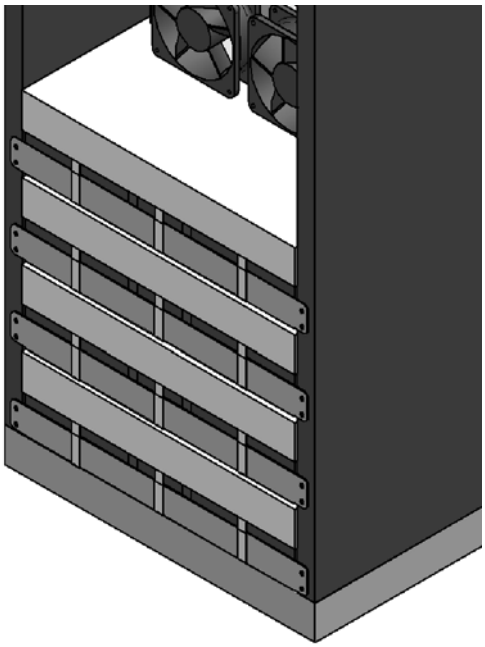
CAUTION: do not dump the exausted batteries in the environment.

3.5.1 Battery connection and positioning

3.5.1.1 3,3Ah 12V battery connection and positioning – INFINITY 10kVA

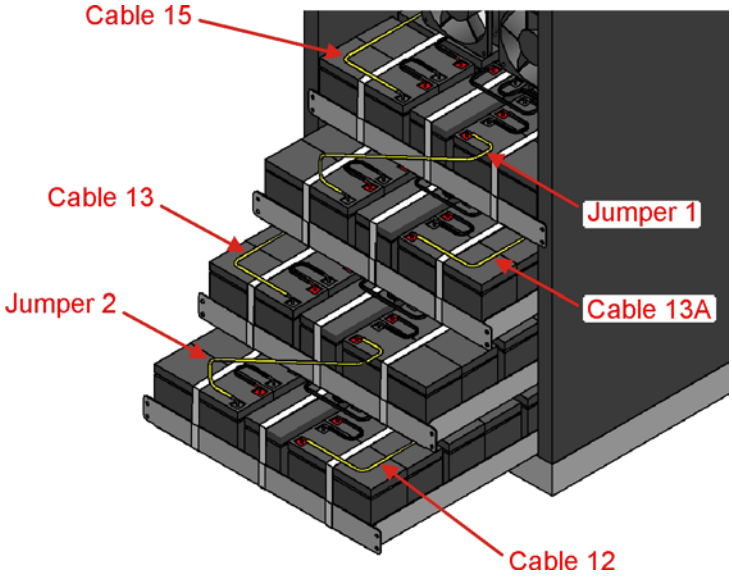
1) Remove the four screws to open the front cover and access the battery trays.

2) Remove the paperboard cover protection from the batteries, see picture 12.



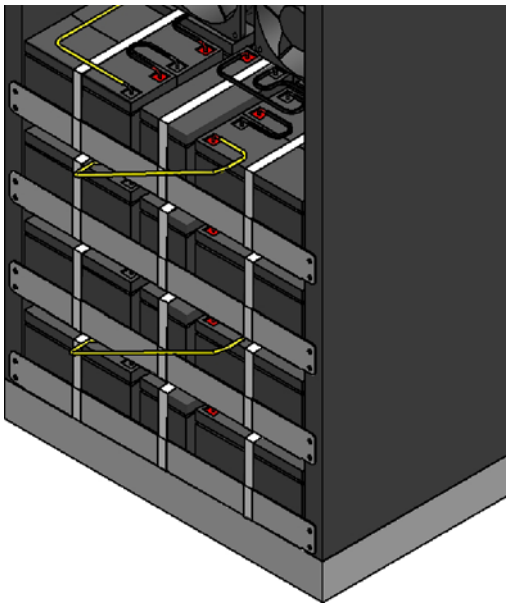
Picture 12 – Paperboard 3,3Ah battery protection

3) Connect the wires as shown on the picture 13.



Picture 13 – 3,3Ah battery connection

4) After the connection re-insert the battery trays as shown in pictures 14.



Picture 14 – 3,3Ah battery connected

Put back and fix the front cover with the four screws.

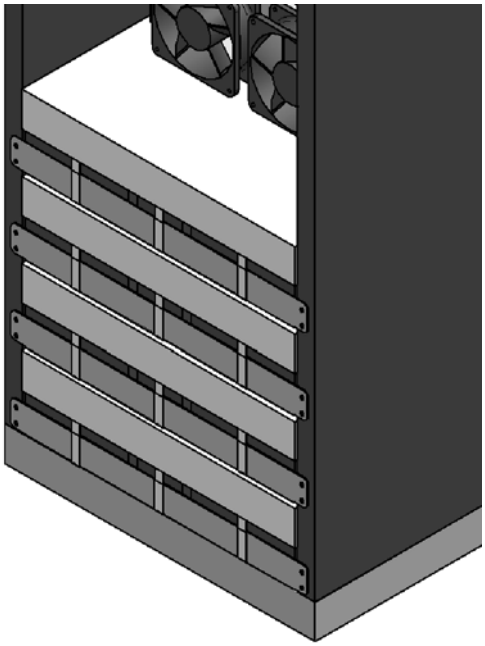
WARNING

After the battery installation, before closing BCB, check the voltage polarity in the top and bottom of the BCB circuit breaker.

3.5.1.2 7Ah / 9Ah 12V battery connection and positioning–INFINITY 10-15-20kVA

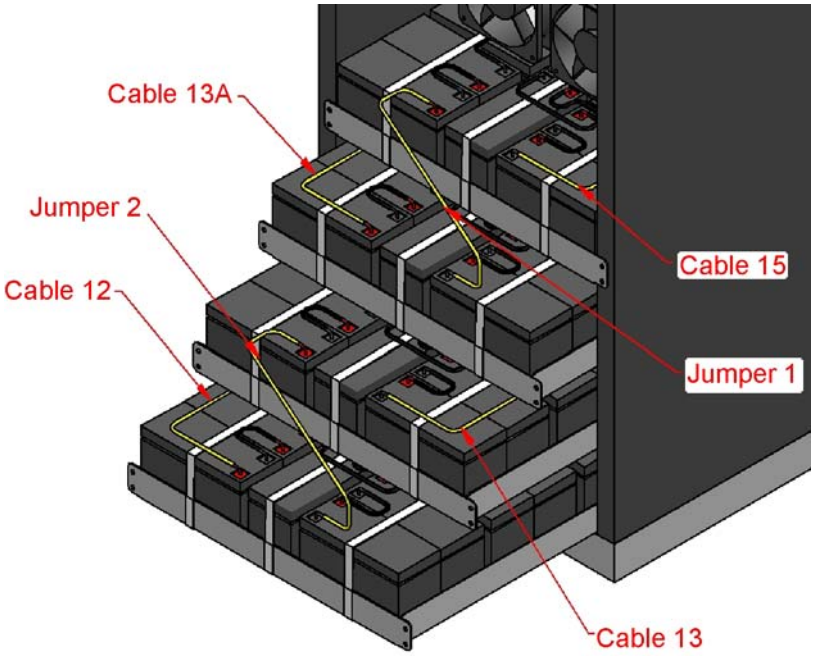
1) Remove the four screws to open the front cover and access the battery trays.

2) Remove the paperboard cover protection from the batteries, see picture 15.



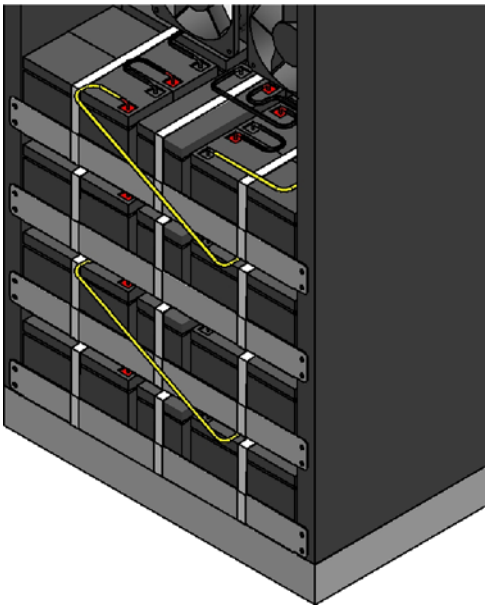
Picture 15 – Paperboard 7Ah/9Ah battery protection

3) Connect the wires as shown on the picture 16.



Picture 16 – 7Ah/9Ah battery connection

4) After the connection re-insert the battery trays as shown in picture 17.



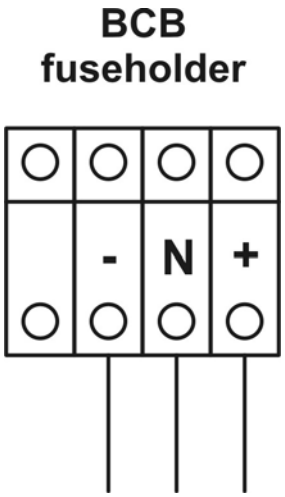
Picture 17 – 7Ah/9Ah battery connected

Put back and fix the front cover with the four screws.

WARNING

After the battery installation, before closing BCB, check the voltage polarity in the top and bottom of the BCB circuit breaker.

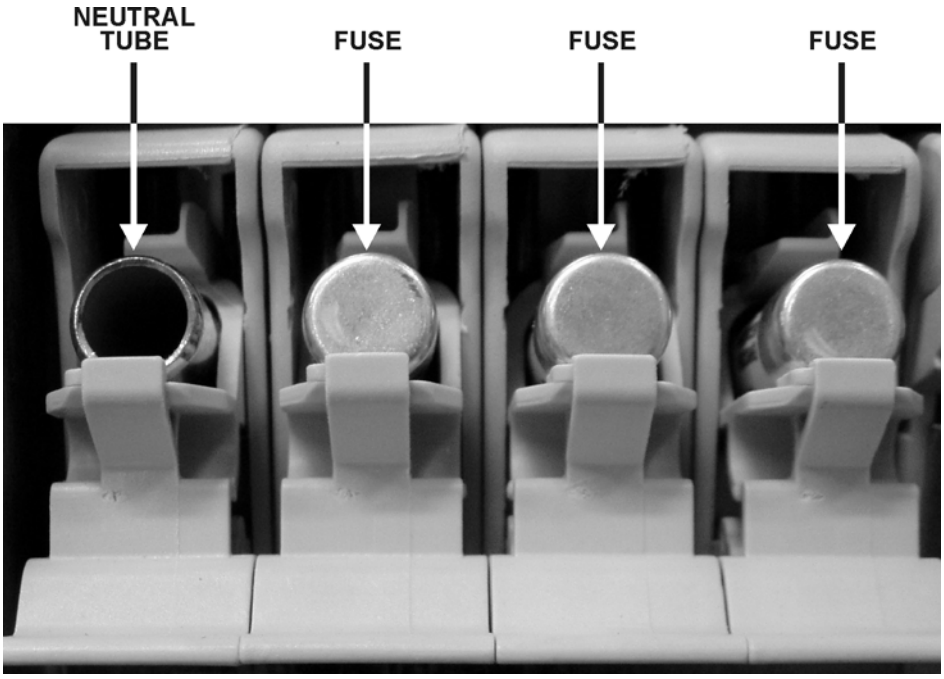
In case of not directly supplied cabling, please connect the cables to the battery breaker as shown in the below picture.



Picture 18 – Cabling of BCB fuse holder

3.6 FUSES POSITIONING BCB – INFINITY 10-15-20KVA

After that the battery is correctly connected, insert the fuses and the neutral tube on the fuseholder (BCB), as shown in the picture 19.



Picture 19 – Fuses positioning on the fuseholder BCB

3.7 AS553 EXTERNAL BATTERY

The battery cabinet can be used to increase the autonomy of the UPS “INFINITY 10-15-20kVA” line for which the battery can be installed internally.

IMPORTANT

With the external battery the internal battery is never present.

The battery cabinet is necessary for the UPS 30-40kVA.

The battery cabinet is composed of two strings in parallel of 60 monoblocks 30+30, for a total of 120 monoblocks of 6 elements each.

The size of the monoblocks can be 7Ah, 9Ah or 12Ah.

- AS553 for 7Ah, 9Ah and 12Ah battery blocks.

The battery circuit breaker and the battery fuses are installed inside the external battery cabinet, see picture 25.

Concerning the installation of the external battery cabinet, refer to the details given in paragraph 3.5.

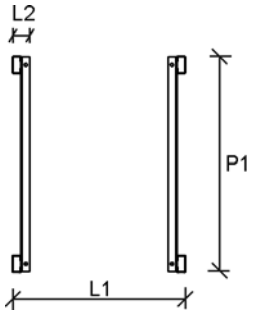
WARNING

In order to maintain the cabinet balanced, extract only one tray at a time.

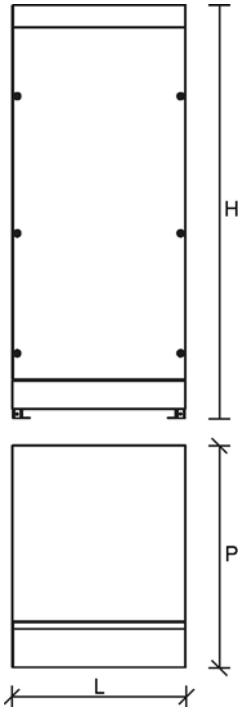
Before accessing the fuses, removing the protection, make sure that no voltage is present.

3.7.1 Dimensions and weights

The dimensions and weights of the external battery cabinet are indicates here under.



Picture 20 – Base plan of the external battery cabinet



Picture 21 – Dimensions of the external battery cabinet

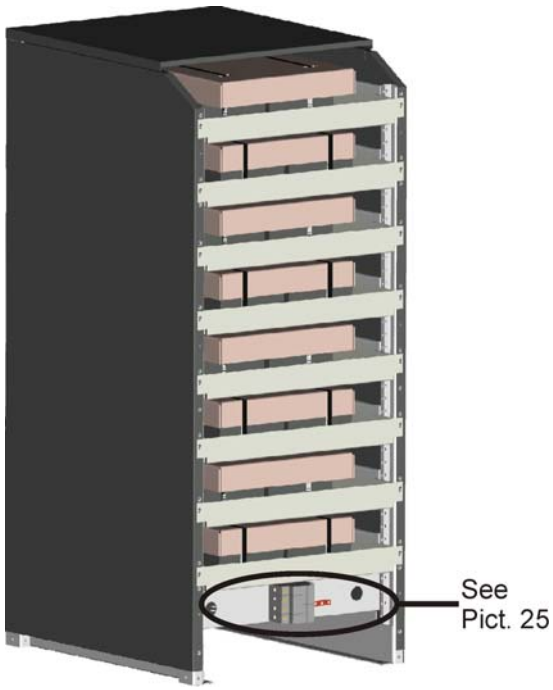
CABINET	**AS553**
L – mm	500
P – mm	650
H – mm	1200
L1 – mm	500
P1 – mm	625
L2 – mm	50

CABINET	**7Ah**	**9Ah**	**12Ah**
Weight w/o battery – kg	86	86	86
Weight with battery – kg	395	413	580
Static load with battery – kg/m^2	1264	1321	1856

3.7.2 7Ah/9Ah/12Ah 12V battery connection and positioning

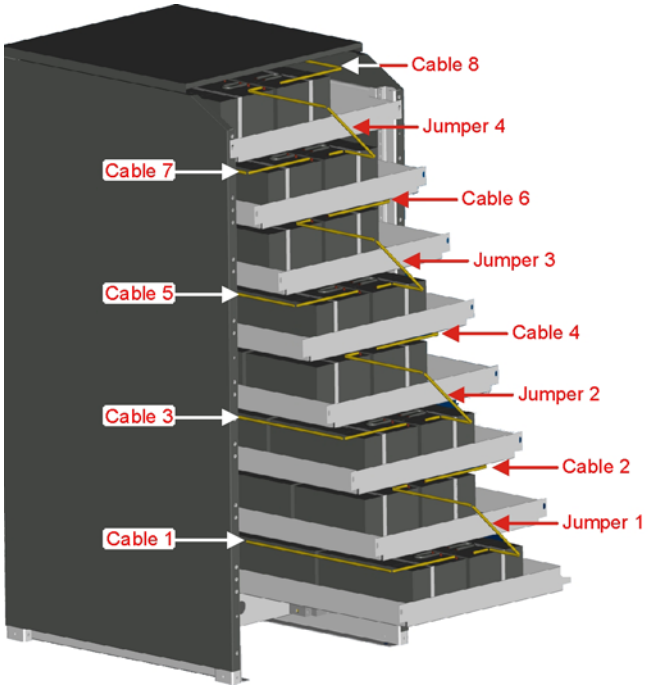
1) Remove the six screws to open the front cover and access the battery trays.

2) Remove the paperboard cover protection from the batteries, see picture 22.



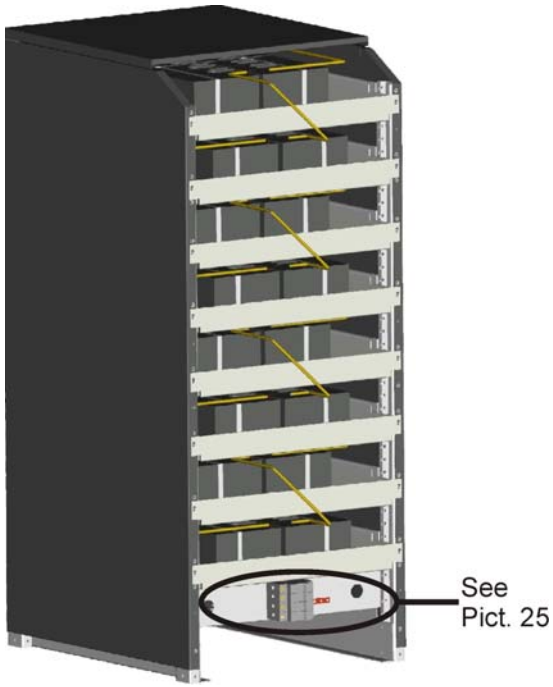
Picture 22 – Paperboard 7Ah/9Ah/12Ah battery protection

3) Connect the wires as shown on the picture 23.



Picture 23 – 7Ah/9Ah/12Ah battery connection

4) After the connection re-insert the battery trays as shown in picture 24.



Picture 24 – 7Ah/9Ah/12Ah battery connected

Put back and fix the front cover with the six screws.

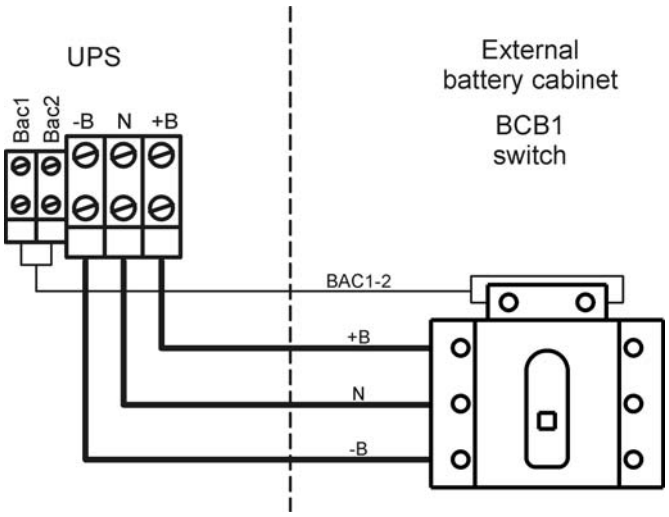
WARNING

After the connection of the batteries, connect battery cabinet to the UPS as indicated on 3.7.3 paragraph before to close BCB.

Picture 25 – Battery circuit breaker and fuses

3.7.3 Connections

The following picture shows the electrical connection between the UPS and the external battery cabinet.



Picture 26 – Battery cabinet and UPS connections

For the connection above mentioned you can use the cables supplied in the battery cabinet.

FRONT PANEL

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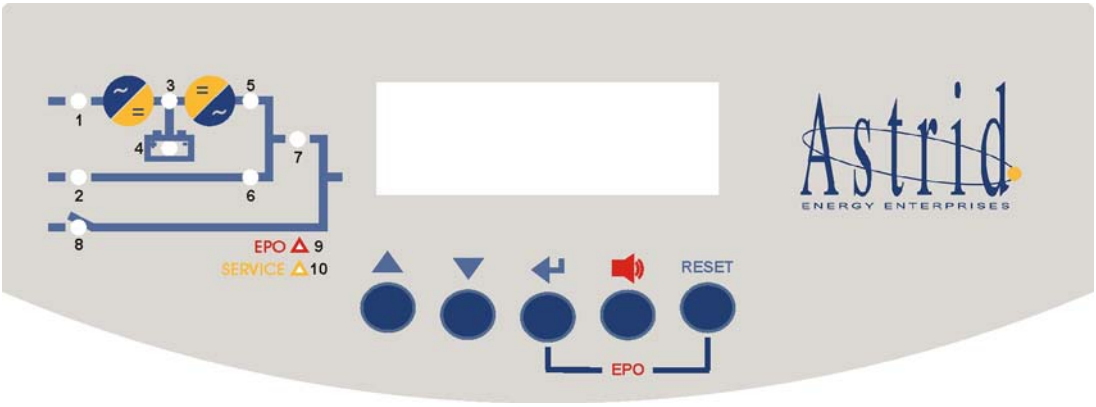
1. INTRODUCTION

The front panel of the UPS, consisting of a four-row alphanumeric display plus 5 function keys, allows the complete monitoring of the UPS status.

The mimic flow helps to understand the operating status of the UPS.



Picture 1 - Front panel INFINITY 3100 and 3300

2. DESCRIPTION

2.1 MIMIC DESCRIPTION

Picture1 shows the mimic present on the display, with the names of the circuit breakers/isolator switches of the UPS. Also the led's and blocks that comprise the UPS are clearly identified.

LED 1 ⇒ Lit-up green = Mains present at the rectifier input.
Green flashing = Wrong input phase sequence.
Off = Rectifier input mains fault.

LED 2 ⇒ Lit-up green = Emergency line present and in order.
Green flashing = Wrong bypass phase sequence.
Off = Emergency line (bypass) fault.

LED 3 ⇒ Lit-up green = Rectifier feeding correctly.
Green flashing = Rectifier in alarm.
Lit-up red = Inverter input voltage out of tolerance.

LED 4 ⇒ Lit-up green = Battery OK.
Green flashing = Battery discharging or battery in test.
Orange flashing = BCB open.
Lit-up red = Battery test aborted.

LED 5 ⇒ Lit-up green = Inverter static switch closed.
Otherwise off.

LED 6	⇒	Lit-up orange = Emergency line static switch closed. Load retransfer blocked. Otherwise Off
LED 7	⇒	Lit-up green = OCB circuit breaker close. Otherwise Off
LED 8	⇒	Lit-up orange = Manual By-pass Circuit breaker closed. Otherwise Off.
LED 9	⇒	Lit-up red = EPO push-button pressed. Otherwise Off
LED 10	⇒	Orange flashing = Programmed service required, contact our service department. Lit-up orange = UPS fault, contact our service department.

2.2 ALARMS AND OPERATING STATUS

The alphanumeric display offers a complete diagnostic of the system by showing 28 alarms and 6 operating status descriptions.

Each alarm is associated to a code that allows it to be stored in the events history.

A1 MAINS FAULT = Rectifier input mains failure

Possible causes:
1) Central system black-out (mains failure)
2) Distribution problems upstream of the UPS
3) RCB open or blown fuses

A2 INPUT WRONG SEQ = Input phase rotation not correct

A3 BOOSTER STOPPED = The input rectifier is off. The battery is discharging.

A4 BOOSTER FAULT = The input rectifier is out of order. The battery is discharging.

A5 DC VOLT FAULT = Inverter input voltage out of tolerance

Possible causes:
1) Mains input missing and battery fully discharged
2) Distribution problems upstream of the UPS
3) RCB open and or BCB open
4) Rectifier bridge failure
5) Inverter bridge failure

A6 BATTERY IN TEST = Battery test in progress

A7 BCB OPEN = Battery circuit breaker open

A8 BATTERY DISCHAR = The battery is discharging

Possible causes:
1) Rectifier input mains failure (alarm A1 or A2 present)
2) Booster stopped (alarm A3)
3) Booster fault (alarm A4)

A9 BATTERY AUT END = Battery autonomy (calculated) has expired

A10 BATTERY FAULT = Battery test failed

Possible causes:
1) The test has been carried out with the battery not perfectly charged
2) One or more battery cells are damaged

It is possible, after having verified the status of the battery, to reset this alarm by means of the front panel (see menu SPECIAL).

A11 SHORT CIRCUIT = Intervention of the short circuit protection (current exceeding 200%)

Possible causes:
1) Problems on the load
2) Distribution problems downstream of the UPS

A12 STOP MAX CURRENT = Inverter bridge stopped for max current

Possible causes:
1) Short circuits for more than 5 sec. at the UPS output
2) Distribution problems downstream of the UPS

It is possible, after having verified the status of the UPS, to reset this alarm by means of the front panel (see menu SPECIAL).

A13 INV OUT TOLERAN = Inverter output voltage out of tolerance

Possible causes:
1) Intervention of the inverter current limitation for excessive load (more than 200%)
2) Inverter failure
3) Inverter switched off (see alarm A12 or A25)

A14 BYPASS WR SEQUEN = Bypass phase rotation not correct (3 ph. output only)

A15 BYPASS FAULT = Emergency line not available for the bypass

Possible causes:
1) Emergency mains failure
2) Distribution problems upstream of the UPS
3) SBCB open
4) Wrong input phase rotation (alarm A14)

A16 BYPASS → LOAD = Load fed by bypass

Possible causes:
1) Inverter overload
2) Thermal image intervention
3) Forced commutation due to the bypass switch operation (alarm A22)
4) Inverter failure
5) Load retransfer blocked on bypass (alarm A17)

A17 RETRANSFER BLOCK = Retransfer between bypass and inverter blocked, load on bypass

Possible causes:
1) Excessive repeated overloads on inverter

It is possible, after having verified that the load is correct, to reset the UPS, and switch back the load to the inverter (see menu SPECIAL).

A18 MBYP CLOSE = Manual bypass breaker closed (the inverter is shutdown)

A19 OCB OPEN = UPS output breaker open

A20 OVERLOAD = Inverter overload (load exceeding 100%). The thermal image protection is started

A21 THERMAL IMAGE = Intervention of the electronic protection due to excessive load

A22 BYPASS SWITCH = Closure of the commutation switch which forces the load to bypass (maintenance)

A23 EPO PRESSED = Intervention of the emergency power off switch according to the EN62040-1

It is possible, after having verified the status of the installation, to restart the UPS by means of the front panel (see menu SPECIAL).
For an external EPO (Optional) the unit restart if the EPO push button is released.

A24 HIGH TEMPERATURE = High temperature on the inverter and/or rectifier bridge

Possible causes:
1) Excessive load
2) Failure or malfunctioning of the cooling system
3) Wrong positioning of the UPS (distance from walls, altitude)

A25 INVERTER OFF = The inverter has been switched off

A26 SSCI COM FAULT = Internal alarm

A27 EEPROM ERROR = Internal alarm

A28 UPS CRITICAL FAULT = Internal alarm
Or of the Alarms A4-A5-A12-A13-A26-A27.

A29 MAINTENANCE REQ = The programmed service timer has expired.

A30 COMMON ALARM = One or more alarms are active

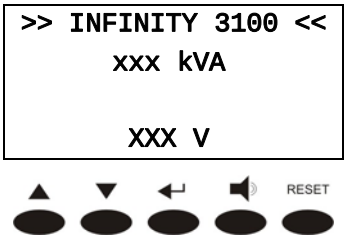
A33 ASYMMETRIC LOAD = Check on “load asymmetry” (damage cables or asymmetric load)

A34 SERVICE REQ = Contact the Service Support

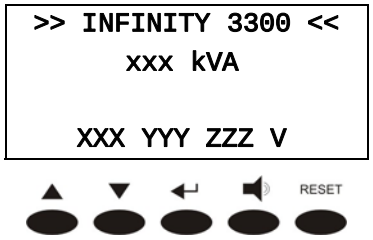
A38 INV → LOAD = Active only in ECO-MODE
Inverter feed load

3. LCD DISPLAY MANAGEMENT

3.1 DEFAULT



1Ph UPS



3Ph UPS

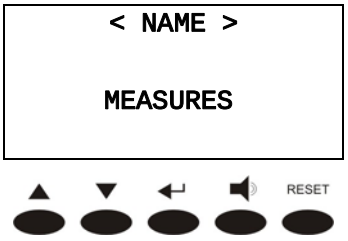
The default screen appears on the LCD panel when the UPS is in normal operation (with no alarm present); it shows the name of the UPS, the nominal power and the value of the output voltage.

Pressing a key the main menu, with all the functions and parameters, is accessed

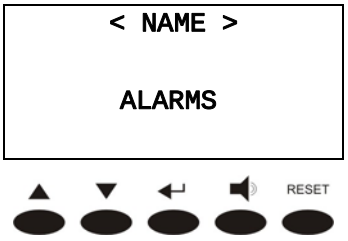
After 5' during which no key is pushed, if there isn't any alarm and the battery is not in discharge mode the Default screen is shown again. If you press the key ↵ on this menu, the output currents first and then time and the date are shown. If you press the ▼ key you enter in the following menu.

3.2 MAIN MENU

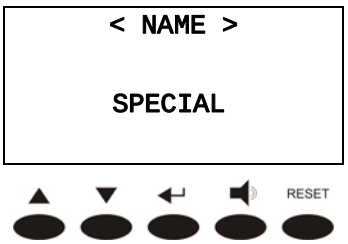
The screen of the main menu, equal for 1Ph and 3Ph UPS's, appears as follows.



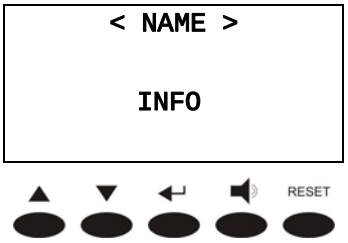
MEASURES menu. It is accessed pressing the key ↵ (see 3.3), pressing the keys ▲ or ▼ the other menu are scrolled down.



ALARMS menu. It is accessed pressing the key ↵ (see 3.4), pressing the keys ▲ or ▼ the other menu are scrolled down.



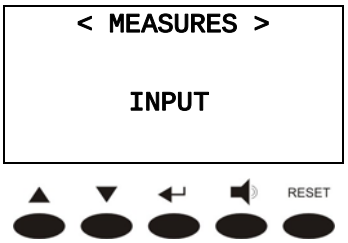
SPECIAL menu. It is accessed pressing the key ↵ (see 3.5), pressing the keys ▲ or ▼ the other menu are scrolled down.



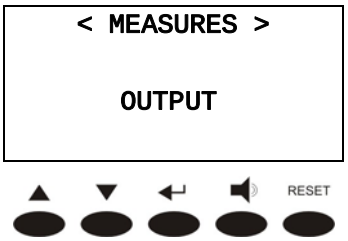
INFO menu. It is accessed pressing the key ↵ (see 3.6), pressing the keys ▲ or ▼ the other menu are scrolled down.

3.3 MEASURES

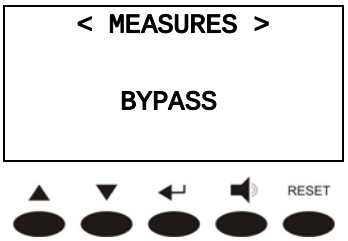
The following pictures shows the structure of the MEASURES menu.



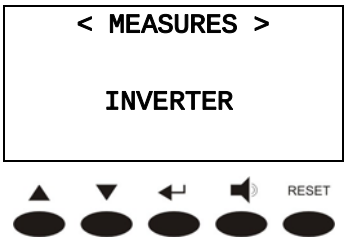
INPUT measures. It is accessed pressing the key ↵ (see 3.3.1), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



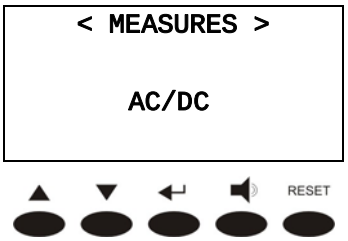
OUTPUT measures. It is accessed pressing the key ↵ (see 3.3.2), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



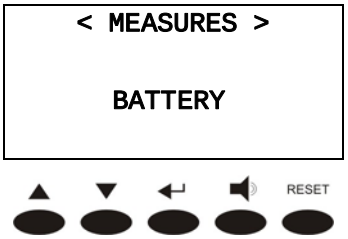
BYPASS measures. It is accessed pressing the key ↵ (see 3.3.3), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



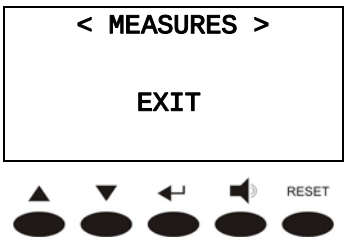
INVERTER measures. It is accessed pressing the key ↵ (see 3.3.4), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



DC measures. It is accessed pressing the key ↵ (see 3.3.5), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



BATTERY measures. It is accessed pressing the key ↵ (see 3.3.6), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



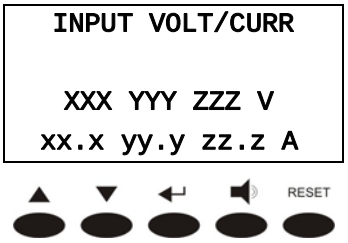
Pressing the key ↵ the main menu screen is shown, pressing the keys ▲ or ▼ the other sub-menu are scrolled down.

NOTE

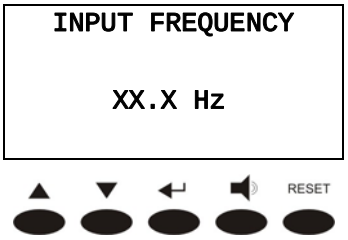
In the following paragraphs the sub-menu will be always represented as shown in the 3Ph UPS systems; the voltage measures are always referred to the phase-to-neutral value.

The structure of the sub-menu for the 1Ph systems remains exactly the same, but the screens and the parameters are slightly different.

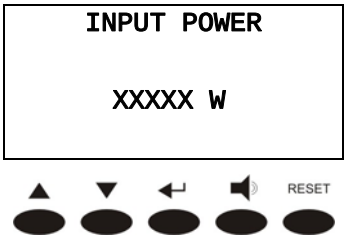
3.3.1 Input



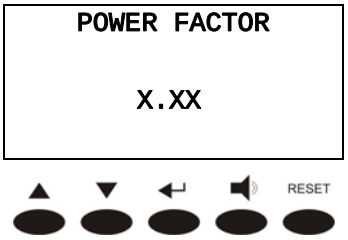
Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



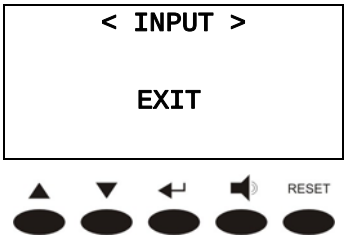
Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.

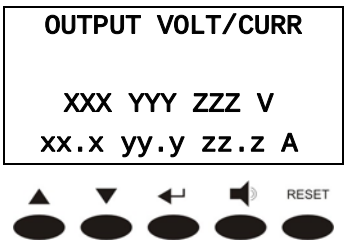


Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.

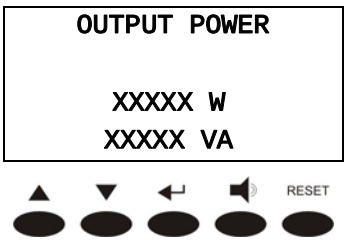


Pressing the key ↵ leads to the MEASURES menu screen (see 3.3), pressing the keys ▲ or ▼ the measures are shown again.

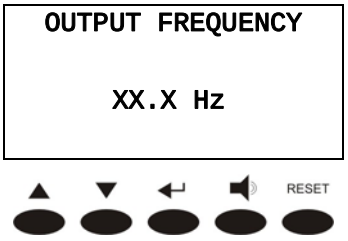
3.3.2 Output



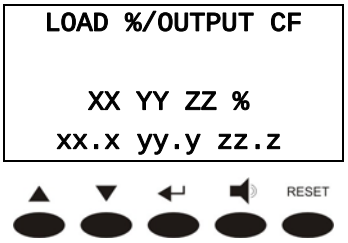
Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



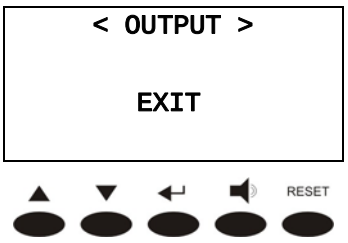
Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.

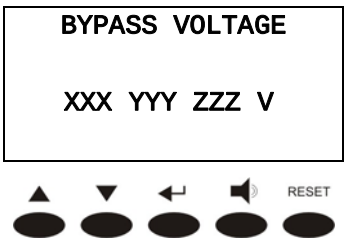


Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.

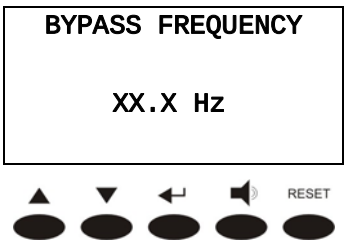


Pressing the key ↵ leads to the MEASURES menu screen (see 3.3), pressing the keys ▲ or ▼ the measures are shown again.

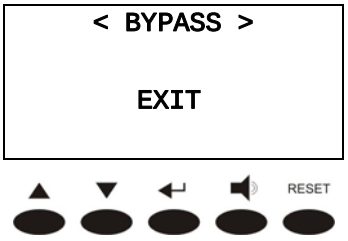
3.3.3 Bypass



Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.

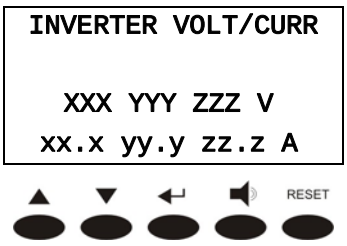


Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.

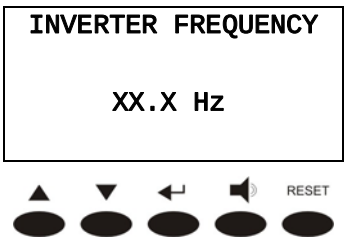


Pressing the key ↵ leads to the MEASURES menu screen (see 3.3), pressing the keys ▲ or ▼ the measures are shown again.

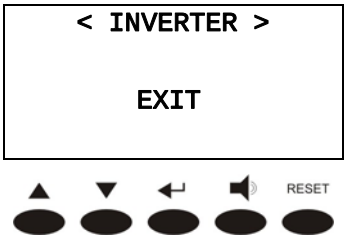
3.3.4 Inverter



Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



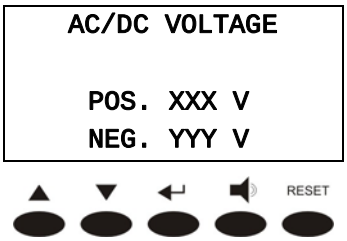
Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



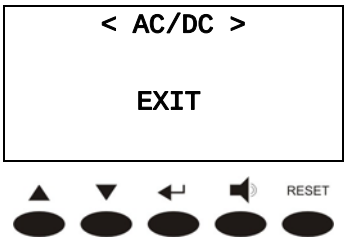
Pressing the key ↵ leads to the MEASURES menu screen (see 3.3), pressing the keys ▲ or ▼ the measures are shown again.

3.3.5 AC/DC

This menu is active only when the battery is not discharging. If the battery is in discharge mode the menu BATTERY is automatically shown.

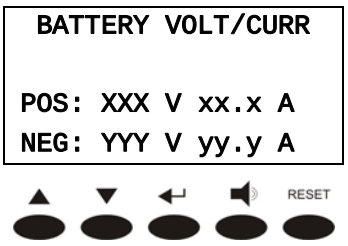


Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.

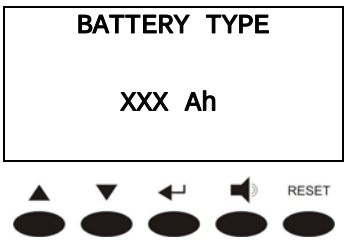


Pressing the key ↵ leads to the MEASURES menu screen (see 3.3), pressing the keys ▲ or ▼ the measures are shown again.

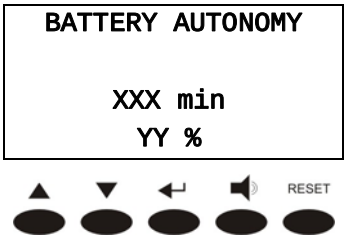
3.3.6 Battery



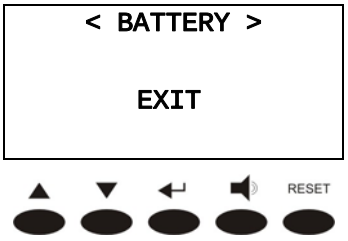
Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



Pressing the key ▼ the following parameter is shown, while the key ▲ leads to the previous screen.



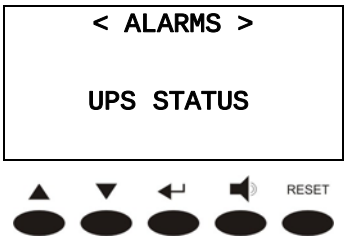
Pressing the key ↵ leads to the MEASURES menu screen (see 3.3), pressing the key ▲ or ▼ the measures are shown again.

3.4 ALARMS

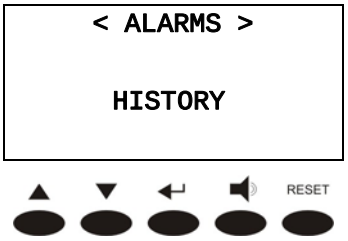
This menu, when selected, shows the status of the equipment and the current alarms are shown (see list below).

Each time an alarm occurs, the display goes to this menu to indicate the alarms present; the audible alarm can be silenced pressing the key 🔊. The exit is disabled if the alarm is not silenced.

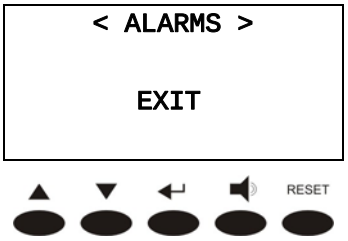
The following pictures shows the structure of the ALARMS menu.



Alarms and status of the UPS. It is accessed pressing the key ↵ (see 3.4.1), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.

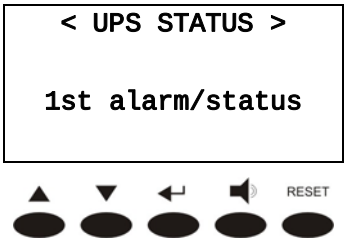


Alarms history. It is accessed pressing the key ↵ (see 3.4.2), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.

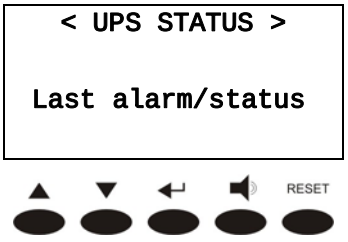


Pressing the key ↵ the main menu screen is shown, pressing the keys ▲ or ▼ the other sub-menu are scrolled down.

3.4.1 UPS Status

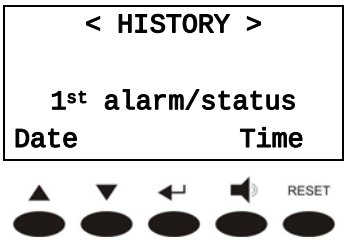


Pressing the key ▼ ▲ the status and/or the alarm of the UPS are shown, while the key ↵ leads to the ALARMS menu screen (see 3.4).

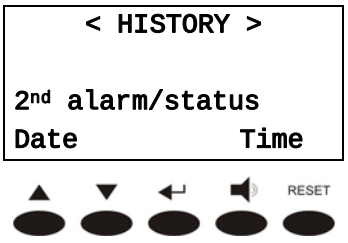


Pressing the key ▼ ▲ the status and/or the alarm of the UPS are shown, while the key ↵ leads to the ALARMS menu screen (see 3.4).

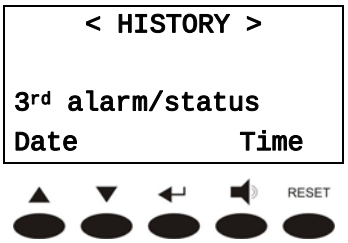
3.4.2 History



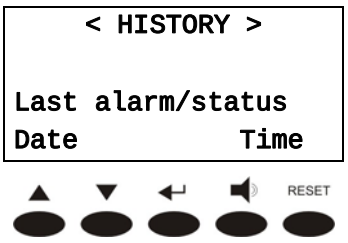
Pressing the key ▼ the following alarm is shown; pressing the key ↵ exit the history, leading to the ALARMS menu screen (see 3.4).



Pressing the key ▼ the following alarm is shown; pressing the key ↵ exit the history, leading to the ALARMS menu screen (see 3.4).



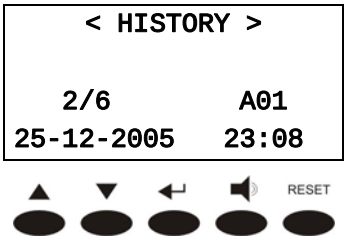
Pressing the key ▼ the following alarm is shown; pressing the key ↵ exit the history, leading to the ALARMS menu screen (see 3.4).



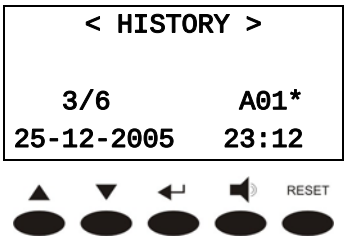
Pressing the key ▼ the first alarm is shown again; pressing the key ↵ exit the history, leading to the ALARMS menu screen (see 3.4).

The first alarm shown is the most recent in order of time; a new alarm makes all the alarms shift one position, clearing the oldest event.

For each event is shown the alarm code, the date and time; an asterisk next to the code indicates that the alarm has cleared at the date and time indicated. The following example shows two possible screens.



Alarm A1 (MAINS FAULT) happened on 25/12/05 at 23:08. The position of this event in list is the second. The total events stored in the history are six.



Reset of alarm A1 (MAINS FAULT) on 25/12/05 at 23:12.
The position of this event in the list is the third. The total events stored in the history are six.

3.4.3 List of alarms and status

List of alarms		List of status	
A1	MAINS FAULT	S1	BOOSTER OK
A2	INPUT WRONG SEQ		
A3	BOOSTER STOPPED		
A4	BOOSTER FAULT		
A5	DC VOLTAGE FAULT		
A6	BATTERY IN TEST	S2	BATTERY OK
A7	BCB OPEN		
A8	BATTERY DISCHAR		
A9	BATTERY AUT END		
A10	BATTERY FAULT		
A11	SHORT CIRCUIT	S3	INVERTER OK
A12	STOP MAX CURRENT		
A13	INV OUT TOLERAN		
A14	BYPASS WR SEQUEN	(**)S4	INV FEED LOAD
A15	BYPASS FAULT	S5	INVERTER SYNCHRO
(**)A16	BYPASS → LOAD	S6	BYPASS OK
A17	RETRANFER BLOCK	(*) S7	BYP → LOAD
A18	MBYP CLOSE		
A19	OCB OPEN		
A20	OVERLOAD		
A21	THERM IMAGE		
A22	BYPASS SWITCH		
A23	EPO PRESSED		
A24	HIGH TEMPERATURE		
A25	INVERTER OFF		
A26	SSCI COM FAULT		
A27	EEPROM ERROR		
A28	UPS CRITICAL FAULT		
A29	MAINTENANCE REQ		
A30	COMMON ALARM		
A33	ASYMMETRIC LOAD		
A34	SERVICE REQ		
(*)A38	INV → LOAD		

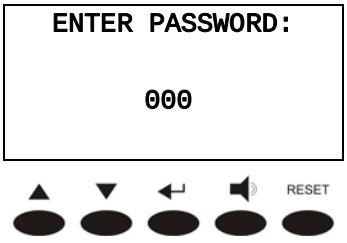
(*) Active in ECO-MODE
(**) Not active in ECO-MODE

The status shown in this list are always displayed in ascending order when the STATUS menu is entered, the alarms are shown when they are present and must be silenced with the buzzer. The alarms remain displayed whilst they are present and they are automatically stored in the event history memory with date and time.

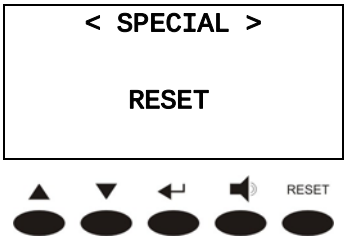
3.5 SPECIAL

IMPORTANT

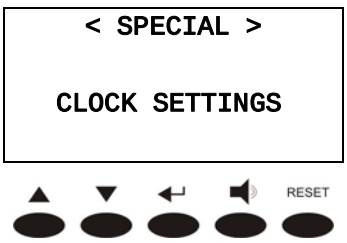
When entering the SPECIAL menu a password is required, as the operations which are allowed needs to be carried out by competent personnel. For each operation a confirmation is required.



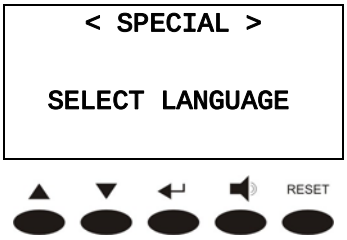
Password entering; if wrong the main menu screen is shown again. Use the ▲ and ▼ to select the numbers, then confirm by ↵.



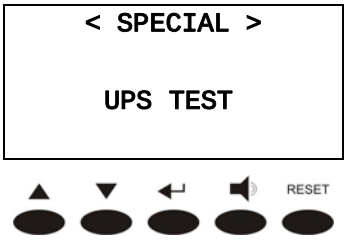
UPS RESET. It is accessed pressing the key ↵ (see 3.5.1), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



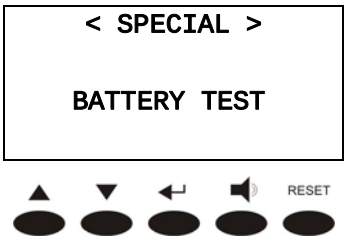
CLOCK SETTINGS. It is accessed pressing the key ↵ (see 3.5.2), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



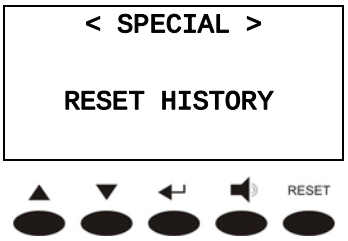
SELECT LANGUAGE. It is accessed pressing the key ↵ (see 3.5.3), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



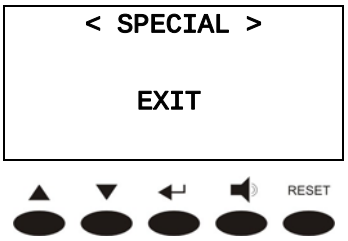
UPS TEST. It is accessed pressing the key ↵ (see 3.5.4), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



BATTERY TEST. It is accessed pressing the key ↵ (see 3.5.5), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.

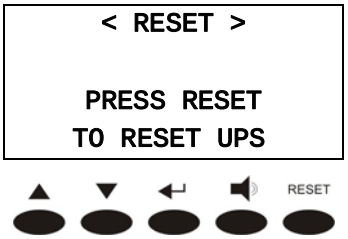


RESET HISTORY. It is accessed pressing the key ↵ (see 3.5.6), pressing the keys ▲ or ▼ the other sub-menu are scrolled down.



Pressing the key ↵ the main menu screen is shown, pressing the keys ▲ or ▼ the other sub-menu are scrolled down.

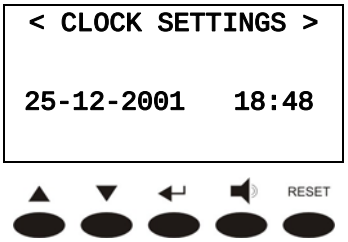
3.5.1 UPS Reset



This menus provides a general reset of the UPS status pressing the key RESET.
Pressing the key ↵ leads to the special menu (see 3.5).

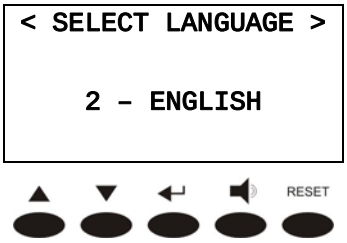
3.5.2 Clock Settings

This menu allows to update time settings for the history of alarms.



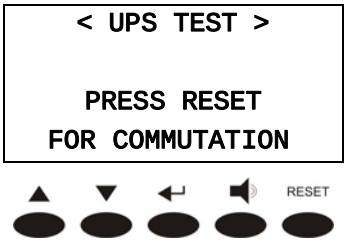
The numbers can be modified with the key ▲ or ▼ and they are confirmed by pressing ↵. Pressing the key RESET leads to the special menu (see 3.5).

3.5.3 UPS Language



The language can be modified with the key ▲ or ▼ and they are confirmed by pressing ↵. Pressing the key RESET leads to the special menu (see 3.5).

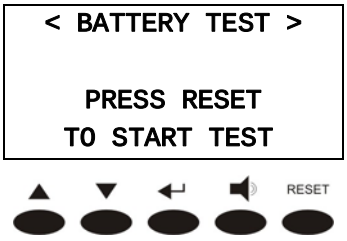
3.5.4 UPS Test



Pressing the key RESET causes the commutation to bypass. Pressing the key ↵ leads to the special menu (see 3.5).

3.5.5 Battery test

The BATTERY TEST cannot be started if this option is not enabled.

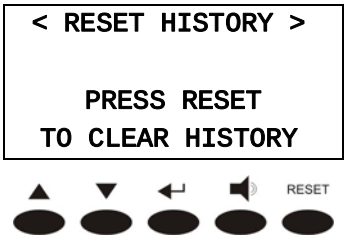


Pressing the key RESET the battery test is started. Pressing the key ↵ leads to the special menu (see 3.5).

WARNING - POSSIBLE LOSS OF LOAD!

This test can affect the continuity of supply to the loads, if the battery is not fully charged.

3.5.6 Reset history

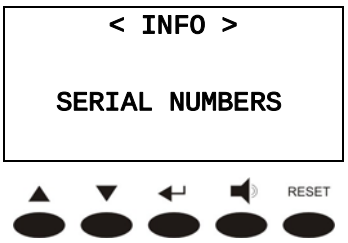


Pressing the key RESET the alarms history is cleared. Pressing the key ↵ leads to the special menu (see 3.5).

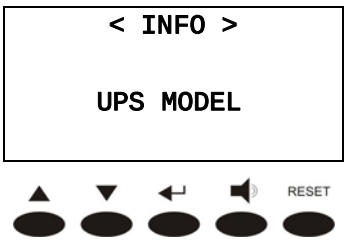
WARNING

This operation causes the cancellation of the events stored in the history memory.

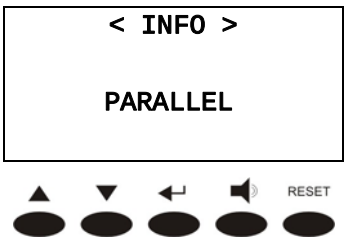
3.6 INFO



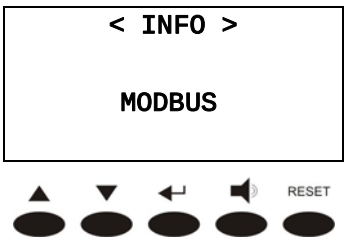
SERIAL NUMBERS. Pressing ↵ (see 3.6.1), and then ▲ or ▼ you can look trough the sub-menu.



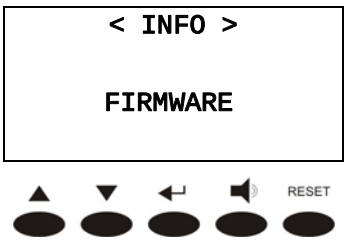
UPS MODEL. Pressing ↵ (see 3.6.2)and then▲ or ▼ you can look trough the sub-menu.



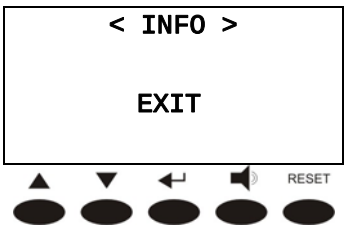
PARALLEL. This menu is active only if our UPS is set in parallel. You can enter ↵ (see 3.6.3),and then pressing ▲ or ▼ you can look trough the sub-menu.



MODBUS. You can enter pressing ↵ (see 3.6.4), and then ▲ or ▼ to look trough the sub-menu.

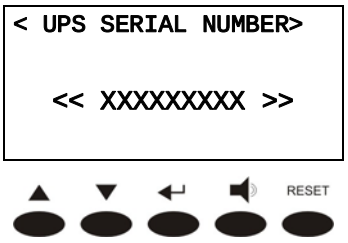


FIRMWARE. You can enter pressing ↵ (see 3.6.5), and then ▲ or ▼ to look trough the sub-menu.

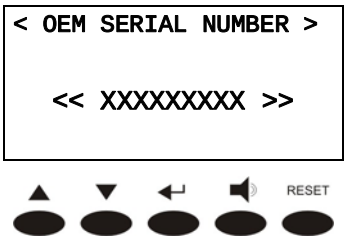


Pressing ↵ you come back to the main menu, and then pressing ▲ or ▼ you can look trough the sub-menu.

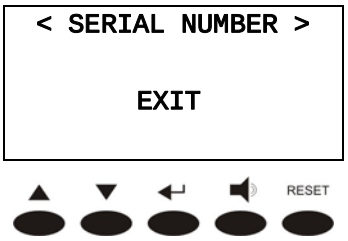
3.6.1 Serial Number



The UPS serial number set by the Supplier.
Pressing ▼ you can enter the next parameter; pressing ▲ you come back to the main menu.

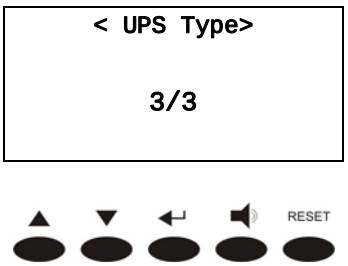


Customized Serial Number.
Pressing ▼ you can enter the next parameter while pressing ▲ you come back to the main menu.

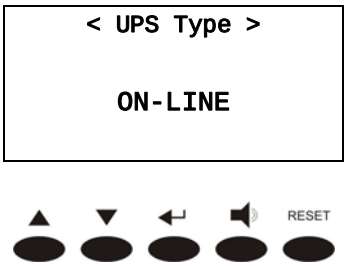


Pressing↵ you come back to the INFO menu. (see 3.6), pressing ▲ or ▼ you can see the measurements.

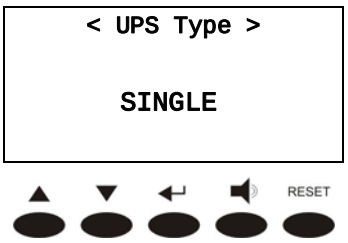
3.6.2 UPS Type



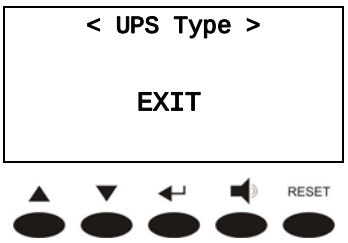
It indicates UPS' input /output. You can see if the l'UPS is Threephase/ Threephase 3/3 or Threephase / Singlephase 3/1.
Pressing ▼ you can enter the next parameter; pressing ▲ you can come back to the previous menu



It indicates the UPS topology:
ON-LINE
ECO-MODE
FREQ CONVERTER
Pressing ▼ you can enter the next parameter; pressing ▲ you can come back to the previous menu



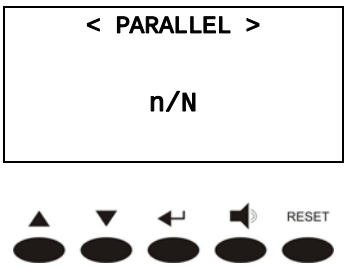
It indicates the UPS configuration:
Parallel or Stand Alone
Pressing ▼ you can enter the next parameter; pressing ▲ you can come back to the previous menu



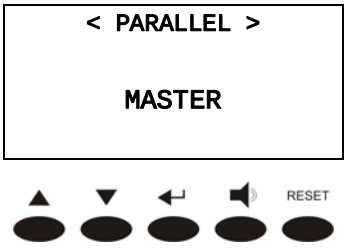
Pressing↵ you can come back to INFO menu (see 3.6), pressing ▲ or ▼ you can see the measurements.

3.6.3 Parallel (Option)

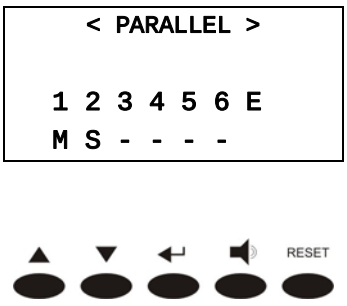
The Parallel menu is active only of the UPS is in Parallel Configuration, otherwise you can not see it on the LCD display.



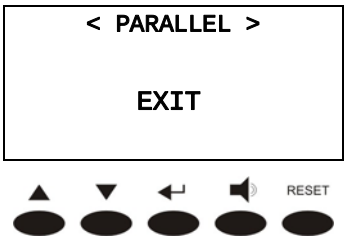
It indicates the UPS n position referring to the total number N of UPS belonging to the Parallel System.
Pressing ▼ you can enter the next parameter; pressing ▲ you can come back to the previous menu.



It indicates the UPS' rule in the Parallel System; if it is Master or Slave.
Pressing ▼ you can enter the next parameter; pressing ▲ you can come back to the previous menu.

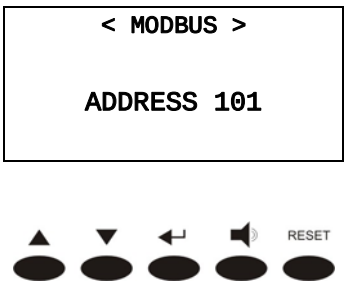


It indicates both the configuration status and the comunication status of the Parallel System. Please see the Parallel Kit Manual or the Parallel Operating Manual for further information.
Pressing ▼ you can enter the next parameter; pressing ▲ you can come back to the previous menu.

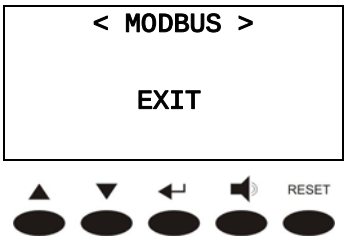


Pressing ↵ you can come back to INFO menu (see 3.6), pressing ▲ or ▼ you can see the measurements.

3.6.4 Mod-Bus (Option)

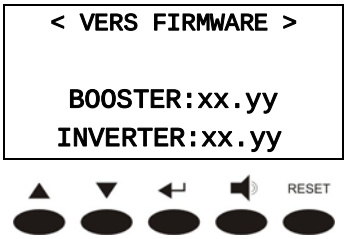


It indicates the RS485 port address to the MOD-BUS Comunication System (Option). Please see the Option Manual for further information.
Pressing ▼ you can enter the next parameter; pressing ▲ you can come back to the previous menu.

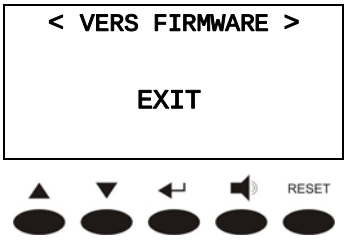


Pressing↵ you can come back to INFO menu (see 3.6), pressing ▲ or ▼ you can see the measurements.

3.6.5 Firmware

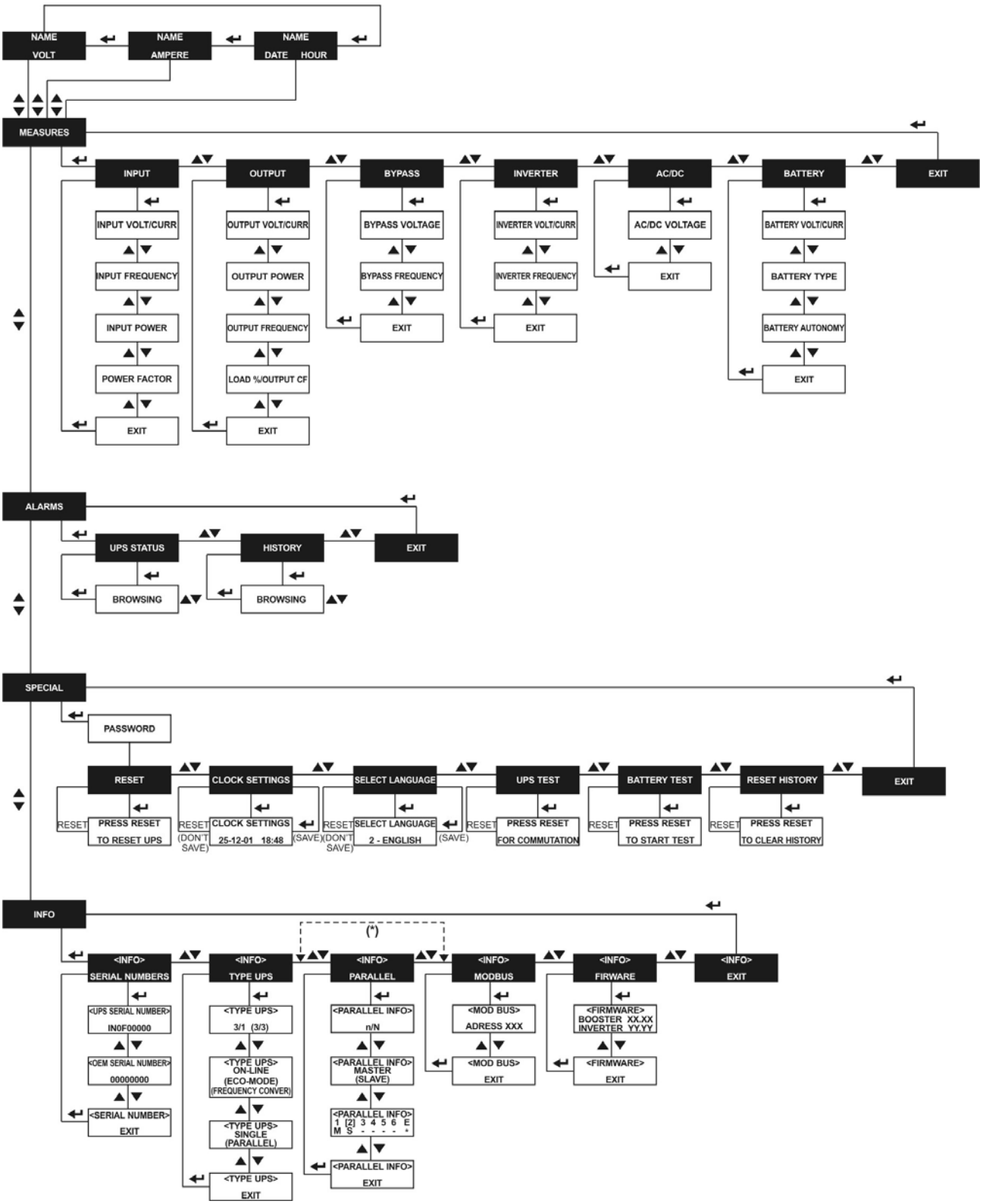


Pressing ▼ you can enter the next parameter; pressing ▲ you can come back to the previous menu.



Pressing ↵ you can come back to INFO menu (see 3.6), pressing ▲ or ▼ you can see the measurements.

3.7 MENU STRUCTURE



Picture 2 - Structure Menu

(*)The Parallel menu is active only of the UPS is in Parallel Configuration, otherwise you can not see it on the LCD display.

START-UP, SHUTDOWN & MANUAL BYPASS

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1. INTRODUCTION 2
2. START-UP PROCEDURE 2
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4. MANUAL BYPASS PROCEDURE 4
5. START-UP FROM MANUAL BY-PASS 5

1. INTRODUCTION

Before carrying out whatever procedure described in this chapter, read carefully the instructions, in order to avoid possible damages to persons or thing due to wrong manoeuvre.

2. START-UP PROCEDURE

WARNING

Before switching on the UPS, make sure:

1) the emergency power off "EPO" push-button, if provided, is in the release position; if not, press it and proceed with the start-up procedure;
2) the input and output phase rotation is correct.

NOTE

The breaker BCB is installed inside the UPS's up to 20 kVA. Batteries and the relevant breaker for UPS systems having higher power are external.

WARNING

Do not close the battery breaker BCB before it's required by the front panel. Serious damages to UPS internal parts may occur if the breaker is closed before the rectifier is started-up.

Nr.	LCD DISPLAYING	ACTION	UPS OPERATION
1	BLANK	**Close RCB**	
2	UPS START UP WAIT PLEASE		The rectifier is supplied and the DC voltage increases up to the nominal value. All LED's in the front panel are lit green. The microprocessor checks all the start-up conditions are ok.
3	BOOSTER START UP WAIT PLEASE		The rectifier IGBT bridge starts to modulate and the inverter intput voltage reaches the nominal value. After a while LED #3 is lit green.
4	INVERTER START UP WAIT PLEASE		The inverter IGBT bridge starts to modulate and the inverter output voltage reaches the nominal value. After a while the inverter static switch thyristors close. LED #5 is lit green.
5	BYPASS START UP CLOSE SBCB	**Close SBCB**	
6	BYPASS START UP WAIT PLEASE		The microprocessor checks that all the by-pass parameters (voltage, phase sequence, frequency) are within the tolerance limits. LED #2 is lit green.

7	BATTERY START UP CLOSE BCB	**Close BCB**	
8	BATTERY START UP WAIT PLEASE		The microprocessor checks all the conditions for the following step are ok. After a while LED #4 is lit green.
9	START UP END CLOSE OCB	**Close OCB**	
10	START UP END WAIT PLEASE		The microprocessor checks that all the output parameters (voltage, current, frequency) are within the tolerance limits. LED #7 is lit green.
End	UPS MODEL OUTPUT VOLTAGE		After a while the default screen is shown

2.1 START-UP BASIC TROUBLESHOOTING

This paragraph provides the basic information if any alarms occur during the start-up procedure. In case the problem cannot be solved contact the service department.

1) *After closing RCB the LCD display is still blank*
   - Check the input voltage.
   - Check the rectifier protection fuses F1-F2-F3; they are inside the breaker RCB on INFINITY 3100 and 3300 up to 20 kVA.
2) *After the step #2 the unit doesn't switch to step #3 and shows the alarm A1 – Mains fault*
   - Check if the alarm A2 is active. In case of alarm active, check the phase rotation of the line input.
   - Check the rectifier protection fuses F1-F2-F3; they are inside the breaker RCB on INFINITY 3100 and 3300 up to 20 kVA.
3) *After the step #3 the unit shows alarms messages*
   - Open RCB and check the UPS connections.
   - Close RCB and try to restart the UPS.
4) *After the step #4 the unit shows alarms messages*
   - Check the EPO push-button (if provided outside the unit) is in the release position.
   - Open RCB and check the UPS connections.
   - Close RCB and try to restart the UPS.
5) *After the step #10 the unit shows the alarm A15 – Bypass fault*
   - Check if the alarm A14 is active. In case of alarm active, check the phase rotation of the by-pass line input.
   - Check the static switch protection fuses; they are inside the breaker SBCB on on INFINITY 3100 and 3300 up to 20 kVA.
6) *After the step #10 the unit shows the alarm A7 – BCB open*
   - Check the fuses inside the breaker BCB.

- If an external battery cabinet is installed check the interconnections between the auxiliary contact of the battery breaker (in the external cabinet) and the terminals Bac1-Bac2 of the UPS.

3. SHUTDOWN PROCEDURE

Nr.	ACTION	LCD DISPLAYING	UPS OPERATION
1	**Open OCB**	A30 GENERAL ALARM A19 OCB OPEN	The supply to the load is interrupted. LED #7 off.
2	**Open BCB**	A7 BCB OPEN	The battery is disconnected from the rectifier. LED #4 orange flashing
3	**Open SBCB**	A15 BYP FAULT	The by-pass line is disconnected. LED #2 off.
4	**Open RCB**	A1 MAINS FAULT	The rectifier and inverter are switched off.
5		BLANK	Shut-down procedure end.

4. MANUAL BYPASS PROCEDURE

WARNING

During manual bypass operation the load is supplied directly by the mains, therefore continuous supply is not guaranteed.

Nr.	ACTION	LCD DISPLAYING	UPS OPERATION
1	**Switch "NORMAL BYPASS" selector on *BYPASS***	A30 GENERAL ALARM A22 BYP SWITCH A16 BYP → LOAD	The load is transferred to the by-pass static switch. LED #5 off, LED #6 lit orange.
2	**Close MBCB**	A31 MBYPBUS CLOSE A25 INVERTER STOP A18 MBY CLOSE	The load is supplied by the mains through the manual by-pass circuit breaker. The inverter is switched off. LED #8 lit orange.
3	**Open OCB**	A19 OCB OPEN	LED #7 Off. The Inverter Restart.
4	**Open SBCB**	A15 BYPASS FAULT /A25 INVERTER STOP	LED #5 lit green, LED #6 Off, LED #2 Off no Bypass.
5	**Open BCB**	A7 BCB OPEN	The Battery is disconnected. LED #4 flashing orange.
6	**Open RCB**	BLANK	The load is now supplied directly by the mains through the manual by-pass circuit breaker. The UPS is isolated.

5. START-UP FROM MANUAL BY-PASS

Before the start-up from manual by-pass (after a maintenance or repairing) check that the “NORMAL-BYPASS” switch is in *BYPASS* position.

Nr.	LCD DISPLAYING	ACTION	UPS OPERATION
1	BLANK	**Close RCB**	
2	UPS START UP WAIT PLEASE		The rectifier is supplied and the DC voltage increases up to the nominal value. All LED’s in the front panel are lit. The microprocessor checks all the start-up conditions are ok. LED’s #1 is lit green and #6 are lit orange. LED #8 is lit orange.
3	BYPASS STARTUP CLOSE SBCB	**Close SBCB**	LED #1 LED #3 is lit green, LED #6 LED #8 is lit orange.
4	BYPASS STARTUP WAIT PLEASE		The microprocessor checks that all the by-pass parameters (voltage, phase sequence, frequency) are within the tolerance limits. LED #2 is lit green. The by-pass static switch is closed, LED #6 is lit orange.
5	CLOSE BCB WAIT PLEASE	**Close BCB**	The microprocessor checks all the conditions for the following step are ok. LED #4 is lit green.
6	CLOSE OCB WAIT PLEASE	**Close OCB**	The load is supplied by the by-pass static switch. The breaker MBCB is still closed. LED #7 is lit green.
7	OPEN MBCB WAIT PLEASE	**Open MBCB**	The load is now supplied by the by-pass static switch only and the inverter can be started-up. LED #8 is off.
8	INVERTER START UP WAIT PLEASE		The inverter IGBT bridge starts to modulate and the inverter output voltage reaches the nominal value. The microprocessor checks the synchronisation with the by-pass line.
9	MOVE BYP-SWITCH WAIT PLEASE	**Move the “NORMAL-BYPASS” switch on *NORMAL***	The load is transferred to the inverter static switch. LED #5 is lit green. LED #6 is off.
10	START UP END WAIT PLEASE		The microprocessor checks that all the output parameters (voltage, current, frequency) are within the tolerance limits.
11	UPS MODEL OUTPUT VOLTAGE		After a while the default screen is shown

REMOTE CONNECTION OF THE UPS

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   1.2 CONNECTION RS232 PORT 2
   1.3 CONNECTION BY USB PORT 3
2. REMOTE CONNECTION BY RS485 (OPTIONAL) 3
   2.1 DESCRIPTION 3
3. REMOTE CONNECTION BY SRC (OPTIONAL) 3
   3.1 DESCRIPTION 3

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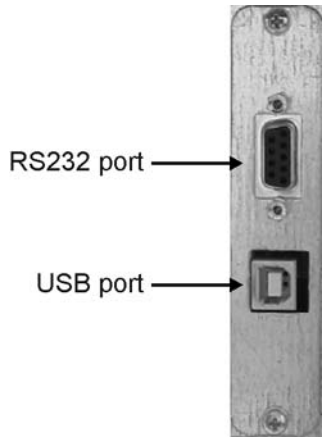
Picture 2 – RS232 connection cable 2

1. REMOTE CONNECTIONS BY RS232 OR USB

1.1 INTRODUCTION

The INFINITY UPS is provided with a RS232 port and an USB port as standard.



Picture 1 – RS232-USB Ports

1.2 CONNECTION RS232 PORT

The UPS can be connected to a monitoring Device/Software through a RS232 standard port with a RS232 standard cable (Male-Female DB9).

The UPS data on the RS232 are transferred according to a Question-Answer Proprietary Protocol.

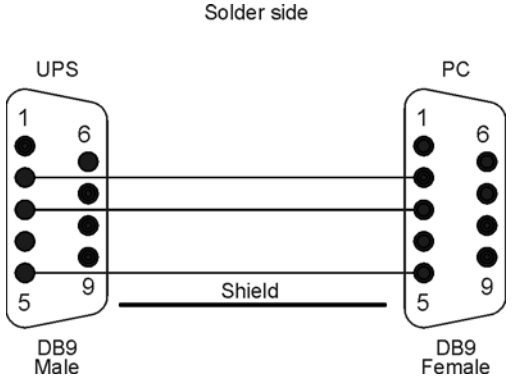
The Settings parameters of the RS232 on the INFINITY are:

Baud Rate = 9600
Parity = None
Data = 8
BitStop = 1

NOTE

Ask the UPS Manufacturer for more information about the UPS Protocol

The connection cable is built as follows:



Picture 2 – RS232 connection cable

1.3 CONNECTION BY USB PORT

Instead of using the RS232 serial connection it is possible to connect a monitoring device through the USB Port. In this case when the USB cable is plugged into the USB port and to the monitoring Device (ex. PC) the RS232 is automatically switched off.

The USB Driver is on the CD Monitoring Software.

The USB cable is a standard USB Cable.

2. REMOTE CONNECTION BY RS485 (OPTIONAL)

2.1 DESCRIPTION

When required it's possible to install on the INFINITY UPS the optional card RS485 SLOT_REM. Through the RS485 interface the UPS can be remotely monitored up to 400m. The protocol implemented on the RS485 port is a MOD-BUS RTU standard protocol.

For further information about the functions of the MOD-BUS protocol and the installation of the card refer to the "Remote connection by RS485 - Installation and user manual".

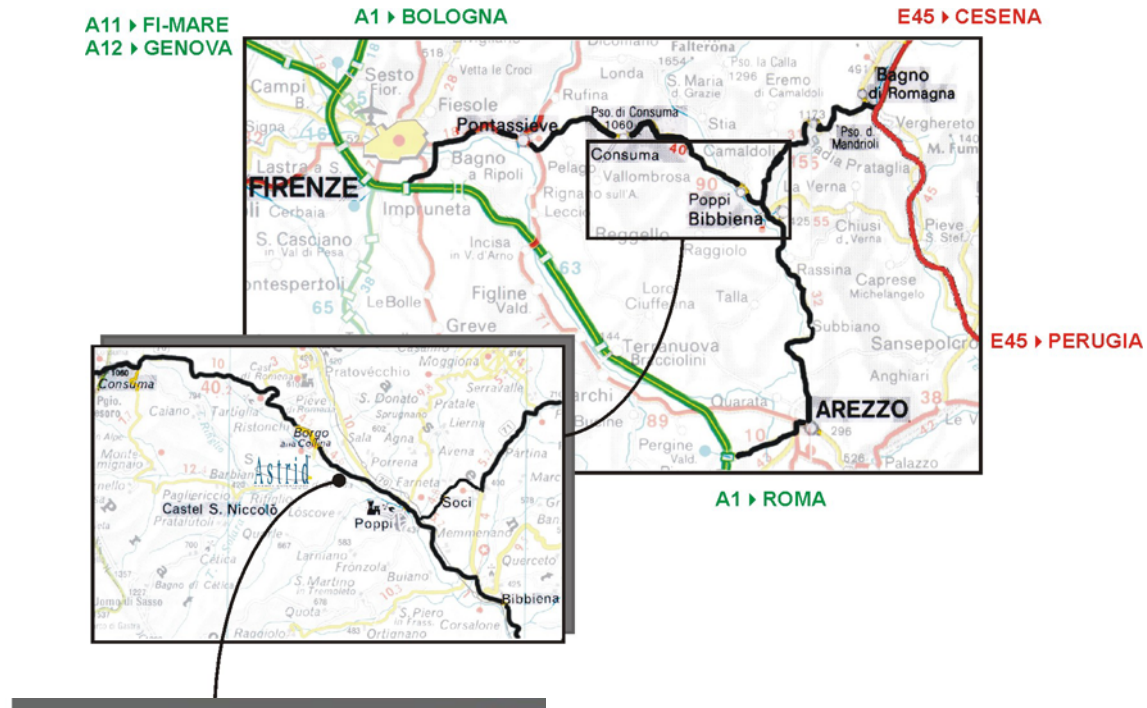
3. REMOTE CONNECTION BY SRC (OPTIONAL)

3.1 DESCRIPTION

The SRC card is used to repeat to a remote location some UPS statuses and alarms, by means of SPDT (Single-Pole-Double-Throw) voltage free contacts.

In normal condition with no Alarms and all Statuses OK, all the relays are energized.

For further information about the installation of the card refer to the "SRC Signalling Remote Card - Installation and user manual".



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