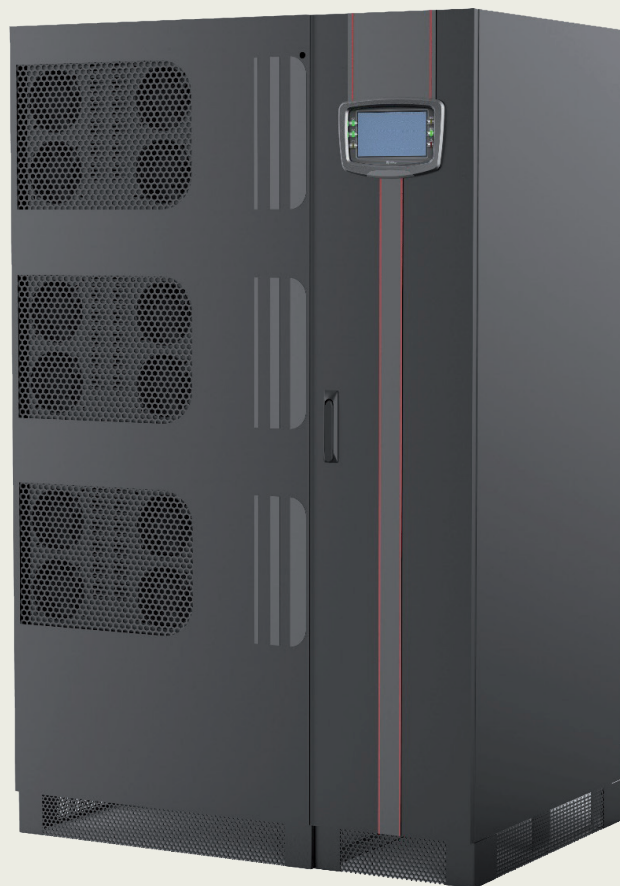


Maxi-J NXE

250 - 400 kVA

THREEPHASE/THREEPHASE

On Line Double Conversion
Technology (VFI)



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PURPOSE

The purpose of this product specification is to detail the technical characteristics of the transformer-less **Maxi-J NXE** UPS, which is designed to provide a clean source of energy to a connected load, without any interruptions caused by disturbances from the mains power supply, including a total power failure.

Maxi-J NXE is a series of UPS designed entirely by AdPoS, a leading manufacturer of Uninterruptible Power Supplies from 350 VA to 800 kVA, with over 25 years' experience within the UPS sector.

To find out about the other products available, such as Static Transfer Switch (STS) for example, please visit our website www.adpos-ups.de.

SYSTEM DESCRIPTION

The **Maxi-J NXE** series is available in 2 three phase models, these being **250, 300 and 400 kVA** utilizing On Line double conversion technology in accordance with VFI-SS-111 classification – as defined by standard IEC EN 62040-3, transformer-less technology.

Maxi-J NXE is compatible with the most critical, industrial and Information Technology (IT) services, thanks to its many operational features including:

- a) Easy Source
 - Low input current distortion below 3% and unity power factor from 10% to 100% of the load. This is possible thanks to the Power Factor Corrected (PFC) rectifier, utilizing an IGBT three phase bridge, controlled using DSP technology;
 - Compatible with motor generators due to a power walk-in function, that guarantees a progressive start-up of the rectifier, a power walk-in delay timer and a battery recharge inhibit feature.
- b) Battery Care System
 - Battery recharge with two voltage levels as per characteristics IU1 U2;
 - Voltage Recharge with temperature compensation;
 - Ability to recharge batteries with a long autonomy;
 - Automated battery test to check the battery performance.
- c) High efficiency in ON-line mode
- d) Thermal overrating of the inverter to guarantee an overload level (kVA) at 110% for 60 minutes.
- e) The nominal output power rating of the UPS is provided at unity power factor (kW=kVA).
- f) Fan failure alarm.
- g) Variable fan speed control depending on the load for noise reduction and efficiency improvement.
- h) Fan redundancy.
- g) Operation without neutral for 3-wire distribution.
- h) Backfeed protection.
- i) 7 inch touch screen display.
- j) Top and bottom cable entry.
- i) System expandability up to 8 units in parallel, Dual BUS (optional).
- j) Energy Management System function for systems in parallel configuration .

UPS Models

NXE 250	UPS 250 kVA 400 V – 50/60 Hz single
NXE 300	UPS 300 kVA 400 V – 50/60 Hz single
NXE 400	UPS 400 kVA 400 V – 50/60 Hz single
NXE 250 P	UPS 250 kVA 400 V – 50/60 Hz parallel
NXE 300 P	UPS 300 kVA 400 V – 50/60 Hz parallel
NXE 400 P	UPS 400 kVA 400 V – 50/60 Hz parallel

UPS Models – IP31 enclosure protection

NXE 250 IP31	UPS 250 kVA 400 V – 50/60 Hz single
NXE 300 IP31	UPS 300 kVA 400 V – 50/60 Hz single
NXE 400 IP31	UPS 400 kVA 400 V – 50/60 Hz single
NXE 250 P IP31	UPS 250 kVA 400 V – 50/60 Hz parallel
NXE 300 P IP31	UPS 300 kVA 400 V – 50/60 Hz parallel
NXE 400 P IP31	UPS 400 kVA 400 V – 50/60 Hz parallel

1. REFERENCE STANDARDS

Our company quality system is certified to ISO 9001/2000 (Certification No. CERT-04116-99-AQ-MIL-SINCERT) and covers all procedures, operating methods and monitoring of all stages from design to production and sales activities.

This certification is a guarantee for the customer with regards to the following aspects:

- Use of quality materials;
- Meticulousness in the production and testing phases;
- Constant customer support.

Besides the company certification, the product is classified VFI-SS-111 in conformity with standard IEC EN 62040-3 and satisfies the following UPS specific standards:

- **IEC EN 62040-1:** Static uninterruptible power supplies (UPS): general and safety provisions;
- **IEC EN 62040-2:** Electromagnetic compatibility (EMC) requirements category C3;
- **IEC EN 62040-3:** Methods of specification of performances and test provisions;

The **Maxi-J NXE** series also makes reference to the following general standards, where applicable:

- **IEC 60529:** Degree of protection provided by enclosures;
- **IEC 60664:** Insulation for low-voltage equipment;
- **IEC 60755:** General Requirements for Residual Current Operated Protective Devices;
- **IEC 60950-1:** General safety provisions for "Information Technology" equipment;
- **IEC 62477-1:** Safety requirements for power electronic converter system and equipment;
- **IEC 61000-2-2:** Electromagnetic compatibility immunity;
- **IEC 61000-4-2:** Electrostatic discharge immunity test;
- **IEC 61000-4-3:** Radio frequencies, electromagnetic immunity test;
- **IEC 61000-4-4:** Transitory overvoltage immunity test;
- **IEC 61000-4-5:** Overvoltage immunity test;

- **IEC 61000-4-11:** Voltage dips, short interruptions and voltage variations immunity test;

European Directives:

LVD directive 2014/35/EU

The LVD covers all health and safety risks of electrical equipment operating with a voltage between 50 and 1000 V for alternating current and between 75 and 1500 V for direct current.

EMC directive 2014/30/EU

The EMC Directive **limits electromagnetic emissions from equipment**; The Directive **also governs the immunity of such equipment to interferences**.

APPLICATIONS

The **Maxi-J NXE** series of UPS are suitable for all applications requiring protection of the critical load, from simple installations to more complex systems where a higher level of reliability and maintainability is required.

Data Centers and Telecommunication: the uninterruptible power system can grow together with your business since the basic system can be expanded with up to eight units connected in parallel without compromising the initial investment. Furthermore, greater levels of reliability and maintainability can be achieved with the more advanced configurations such as the “Dual Bus” and “Dynamic System Expansion”.

Industrial processes and electro-medical systems: the UPS is particularly suitable for applications containing industrial processes and the supply of secure power to electro-medical systems, thanks to its design principles and technical features, such as for example:

- high short circuit and overload capacity;
- high battery recharging capacity, enabling applications with different kinds of batteries (sealed, vented or Nickel Cadmium) with long back-up times.

Emergency systems: the Stand-by OFF mode of operation can be selected to activate the emergency back-up function, as defined by standard EN 50171 (Central Power Supply Systems).

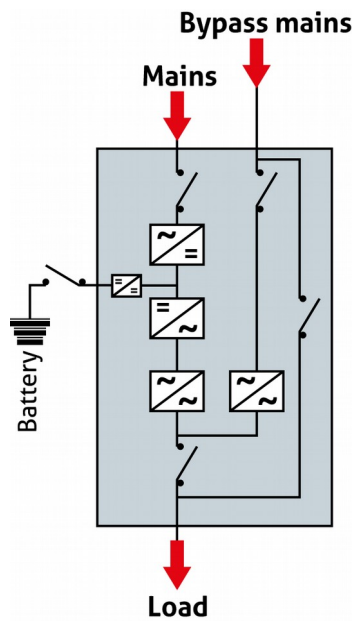
2. CONFIGURATIONS

The following configurations are available:

Single UPS

The single system version, normally used for simple installations, can be extended up to 8 units to satisfy any increases in load level or to introduce a higher level of redundancy with each UPS having its own battery.

The same group of UPS can also function as a frequency converter at 50/60 Hz and vice versa, with or without a battery via a simple reconfiguration that can be done on site (refer to the dedicated paragraph for more information).

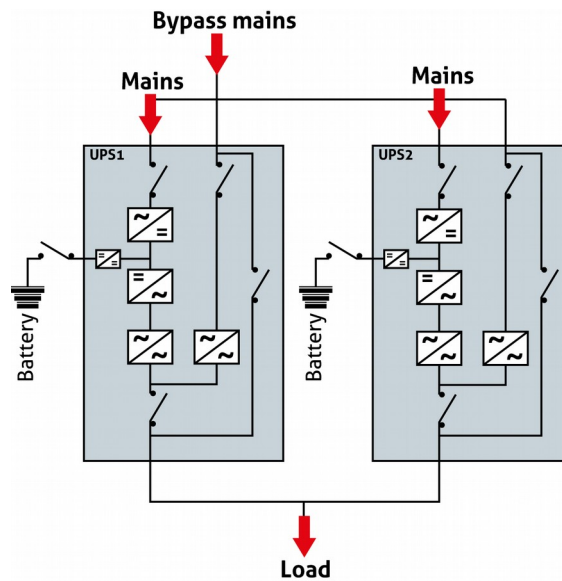


UPS single module

Parallel configuration

Up to 8 UPS can be connected in parallel to increase the power availability from the uninterruptible power system (parallel power) or to enhance its reliability (parallel redundancy). The system is defined as “parallel redundant” when the loss of one or several UPS do not determine the loss of power supply to the critical load.

During parallel operation all the UPS supply the load simultaneously with automatic current sharing.



UPS in 1+1 redundant configuration

When operating in parallel the unit's exchange information with regards to the operating status and the system synchronization signals via a dedicated communication loop connection, providing dual redundancy. This means that even in the event of an accidental interruption of both connections, only the UPS affected by this interruption will safely disconnect from the circuit, whilst the remaining UPS will continue to operate without any interference.

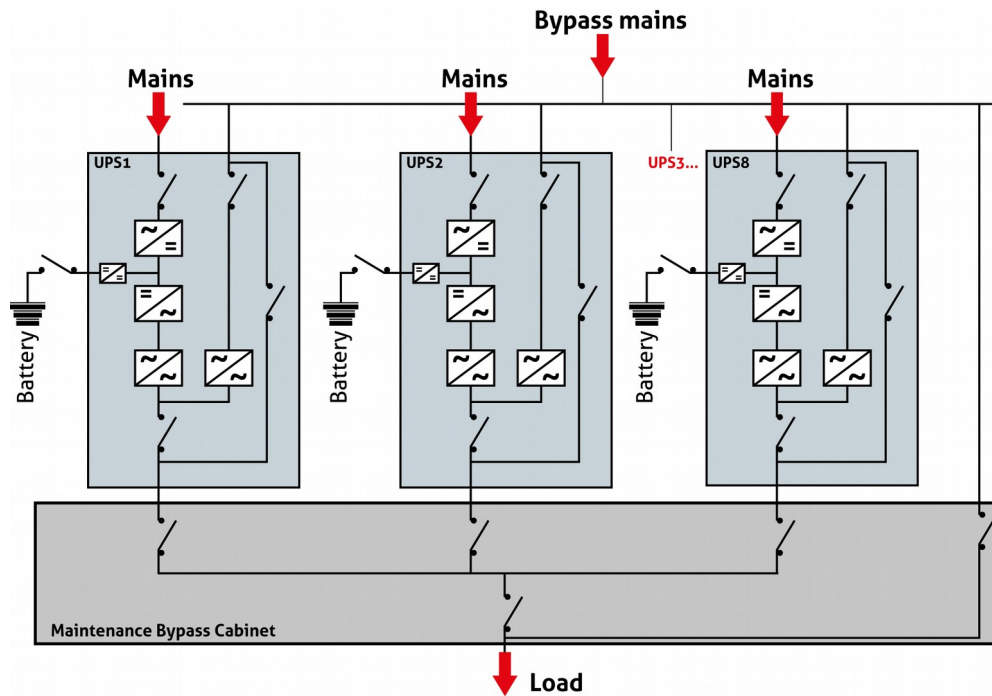
The “**Hot System Expansion**” (**HSE**) feature means that a new UPS can be added to the system while the other units are on-line and powering the load from the inverter. The UPS being integrated will configure itself automatically with the system data without any disturbance to the load.

In configurations with more than two units, to improve the general and extended maintenance operations, it is advisable to install an external maintenance by-pass switch and to inhibit the UPS's internal one.

The UPS is equipped with terminals in order to connect the following auxiliary contacts:

- External Maintenance Bypass Switch
- External Load Output Switch

In the case of a loss of redundancy, the system will show an alarm message highlighting this.



Parallel configuration up to 8 units

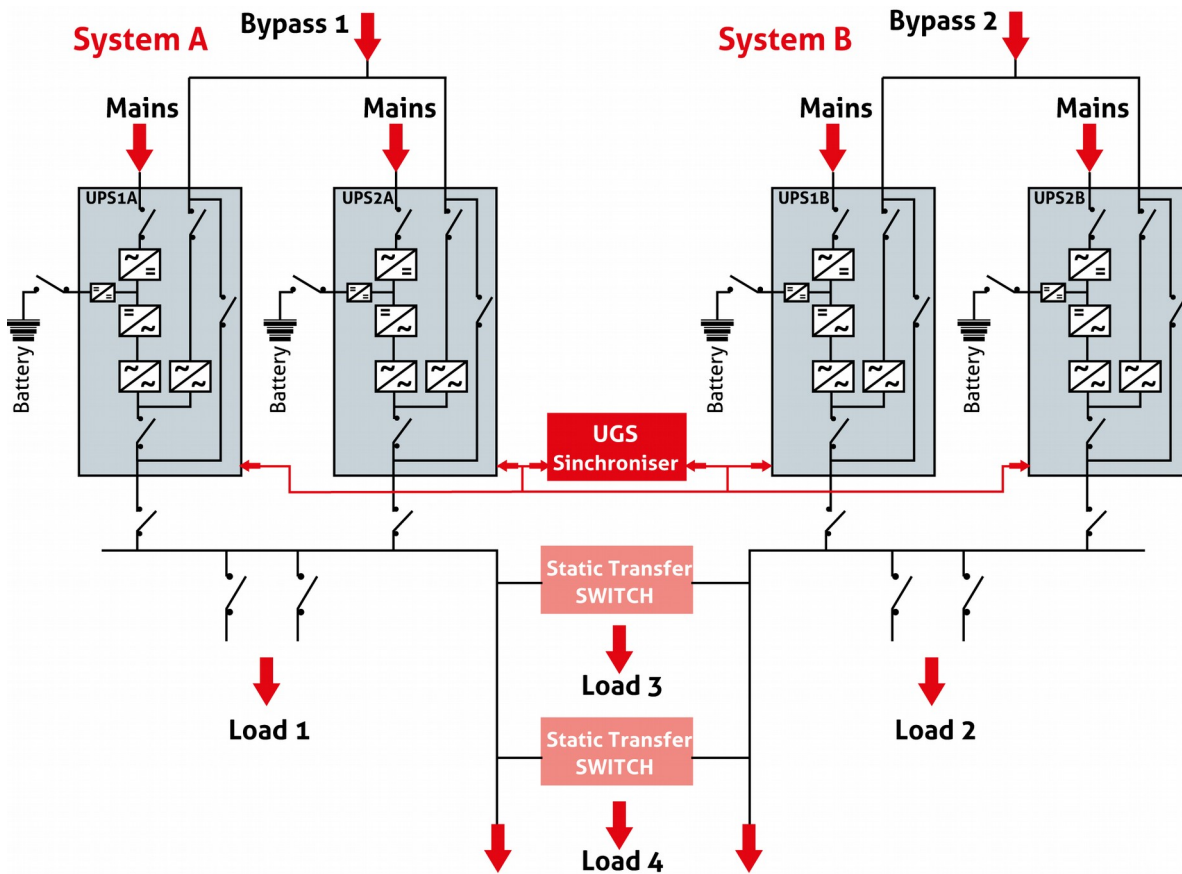
In parallel systems, the “**Efficiency Control System**” (ECS) function enables the UPS to be switched on or off automatically according to any load variations, whilst ensuring the required level of redundancy as defined by the operator. This significantly reduces the total energy dissipated by the system since only those UPS required to power the connected load remain switched on (for example during the night or at weekends).

Dual Bus System (UGS)

Two independent systems can be configured in a Dual Bus format with a single or separate power source. The synchronization option (UGS) ensures that the outputs of the two systems are constantly synchronized, regardless of any input variations and when the system is powered by the battery.

Each system comprises of up to a maximum of 8 UPS in parallel. Meaning that up to 16 units can be synchronized in total.

This system has been specifically designed for configurations that use an STS (Static Transfer Switch) as it guarantees the switching from one continuous source to the other without any disturbance to the connected load.



Frequency Converter

Units in a standard configuration at 400 V can operate as frequency converters (50/60 Hz and vice versa), with or without batteries present. This feature can be configured during the commissioning stage. It must be noted that the bypass is automatically inhibited in this configuration and frequency converters with operating voltages other than 400 V, such as 440 V, 460 V, etc. which can be supplied on request.

In such a configuration, the UPS can be used with or without the input neutral cable.

Note: For Frequency converter applications please contact your sales representative to ensure that the converter layout and technical arrangements comply with all tender requirements.

3. UPS DESCRIPTION

The uninterruptible power supply can be configured to operate in four operating modes: ON-LINE, ECO Mode, SMART ACTIVE and STAND-BY OFF.

Mode: ON-LINE

- **Normal Operation:** The rectifier draws energy from the mains to power the inverter and keep the batteries charged; the inverter powers the load with a stabilised voltage and frequency which remains synchronised with the incoming bypass supply, where appropriate.
- **Emergency operation:** when the mains power supply fails, or exceeds the pre-set limits, the rectifier switches off and the inverter is powered from the battery for the required back-up time without any disturbance to the load. When the mains power supply is restored, the rectifier restarts gradually (power walk in), powering the inverter again and recharging the batteries.
- **By-pass operation:** if the inverter becomes overloaded beyond the designed limits, or in the case of a manual shutdown, the load is automatically transferred onto the by-pass supply by means of the static switch without any disturbance to the load.

Mode: ECO Mode

The load is normally powered from the bypass supply, the rectifier keeps the batteries charged. When the mains power supply fails, or exceeds the pre-set limits, the load is automatically transferred onto the inverter (within three milliseconds) until the mains supply returns to a suitable level.

This mode is suitable for powering loads that are not sensitive to minor mains interferences, thus allowing increased system efficiency of up to 99% from 50 to 100 % load.

Mode: SMART ACTIVE

When the **Maxi-J NXE** is configured in SMART ACTIVE mode, it automatically defines whether to operate in ON-LINE or ECO Mode.

This is done by monitoring the bypass supply: if this remains suitable and stable for a defined period, the system will operate in ECO Mode; otherwise it will remain in ON-LINE mode.

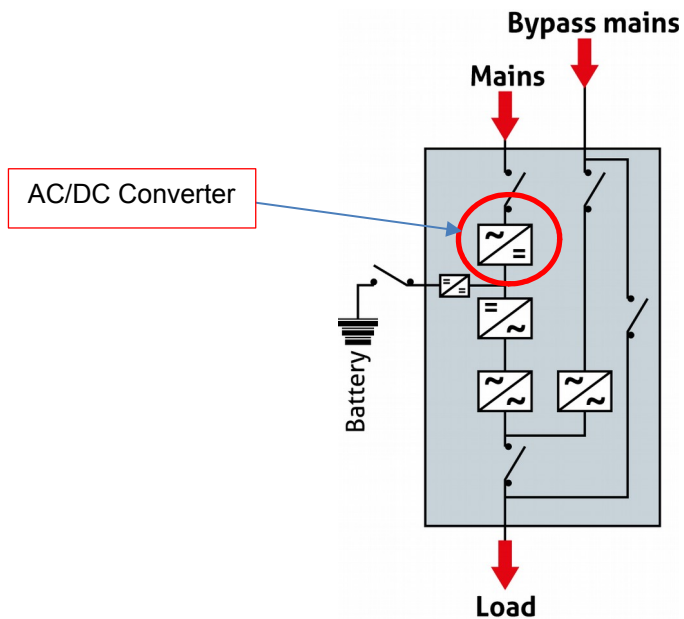
Mode: STAND-BY OFF

When the mains power supply is present, the rectifier keeps the batteries charged and the inverter is switched off. When the mains power supply fails, or exceeds the pre-set limits, the rectifier switches off and the inverter is activated in approximately 200 ms, using the battery energy.

This application is suitable for the supply of power to emergency lighting, as defined by standard EN 50171.

The main blocks of the UPS are

3.1. AC/DC Converter

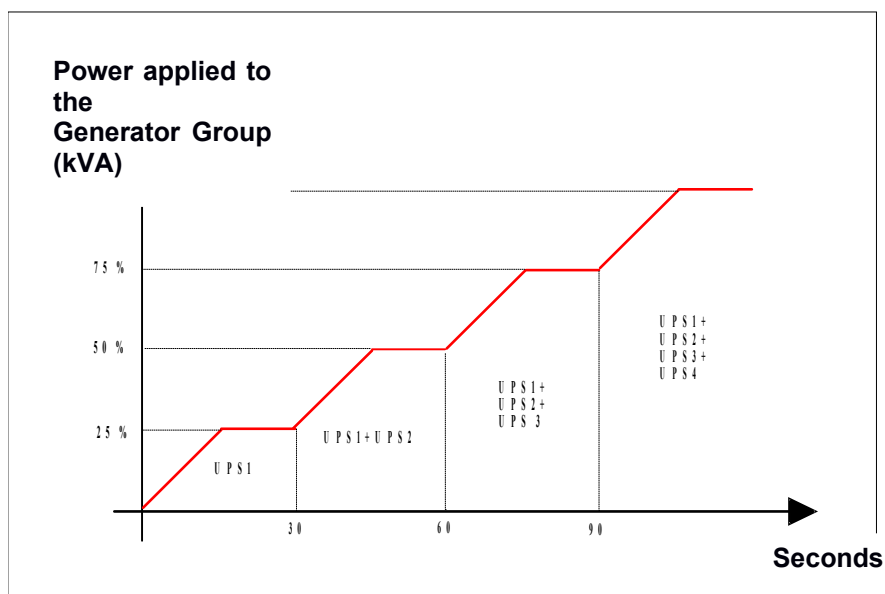


The AC/DC converter converts the alternating current into direct current to power the inverter at nominal load and to charge the batteries. The input stage of the **Maxi-J NXE** UPS is designed and constructed using technology in order to reduce the current harmonics rejected into the mains supply down to 3% and to increase the input power factor up to unity from 10 to 100% of the load (refer to the Technical Data tables at the end of this technical specification).

6.1.1 Easy Source

Maxi-J NXE is designed specifically to reduce the impact on the mains power supply or the supply Generator Set. In detail the specific features are as follows:

- **Input Harmonics:** thanks to the low input harmonics produced and the high input power factor, the installation costs are significantly reduced as well as the sizing of a supply source including a generator set.
- **Power Walk-In duration:** when the input voltage is applied to the rectifier, for example following a mains power supply failure, the load applied to the incoming mains supply is progressively increased within a programmable time period from 0 to 120 seconds.
- **Power Walk-in start delay:** in parallel configurations, the start-up of the rectifiers can be delayed to reduce the impact on any supply generator located upstream. The delayed start-up is programmable up to 120 seconds.

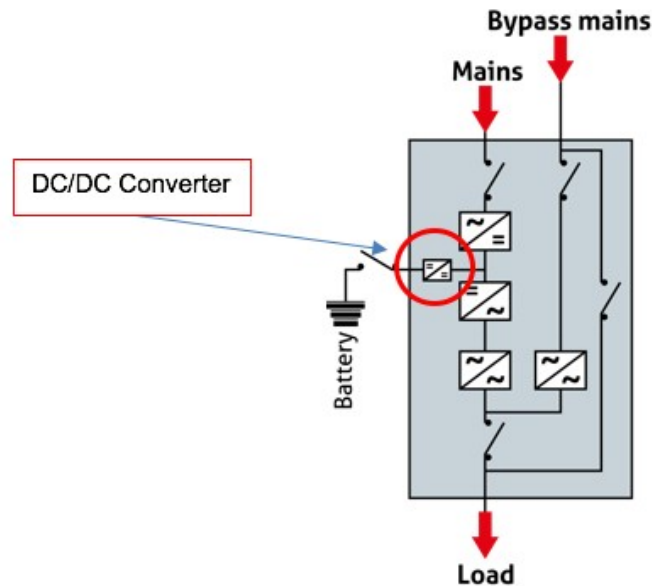


Example of the timed coordination of the rectifiers within a parallel system

- **Inhibition of the battery charge current:** while the UPS is operating from a generator set, battery recharging can be inhibited and so all the available power can be used to supply the load.
- **Inhibition of bypass synchronism:** in the case that the generator set has a very unstable output frequency, the inverter synchronization with the bypass supply can be inhibited. During this scenario the inverter output frequency operates in a free running mode using the UPS's internal oscillator to provide a stable frequency. Consequently, the transfer of the load onto the bypass supply is not allowed.

The "battery recharge current" and "Inverter Synchro with bypass" inhibitions are activated via a remote contact from the generator set connected to the Relay Card (refer to the Communication Chapter)

DC/DC Converter



The DC/DC converter takes the output direct current from AC/DC converter to charge the connected batteries. The system consists of a STEP-UP/STEP-DOWN converter that manages the charging and discharging of the battery, drastically reducing the ripple current within the battery system. The DC/DC converter also provides the following fundamental functions:

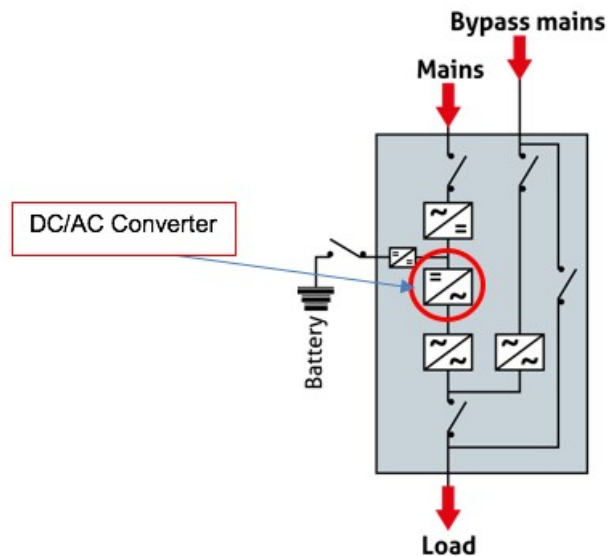
6.2.1 Battery Care System

The “Battery Care System” is a set of functions to control, manage and preserve the battery as long as possible.

- a) **Battery Recharging:** This UPS is suitable for hermetic sealed lead batteries (VRLA), AGM, open vase and Ni-Cd. Depending on the battery type, two recharge methods are available:
 - **Cyclical recharging (factory set):** the state of the battery charge is kept constantly under control and when the charge level drops below the established level, a recharge cycle starts up automatically following the IU characteristic (EN 50272-2). Regardless of this the UPS automatically performs a top-up charge cycle every 24 hours.
 - **Two level recharging (configurable):** this recharging method is performed using two levels of current at two voltage levels following the $IU_1 U_2$ characteristic (EN 50272-2). The first charging phase operates at the boost charge voltage (U_1), followed by a second phase at the float charge voltage (U_2). Both these recharge values are provided with **recharge current temperature compensation** as required by the battery manufacturers so that the battery life is not jeopardized. This type of recharge can be configured on-site and is mainly used with open vase or Ni-Cd batteries.
- b) **Battery test:** in normal operating conditions the battery is checked automatically at regular intervals or via a manual command. The test does not significantly discharge the battery and ensures that the connected load is not effected, but most importantly it does not compromise the battery service life. If the test has a negative outcome, an alarm will be raised on the UPS display panel or via a remote monitoring device.
- c) **Protection against slow discharge:** in the event of long duration discharges and low loads, the end of discharge voltage is increased to approximately 1.8 V/ell as recommended by the battery manufacturers in order to avoid any potential damage occurring to the connected batteries.

- d) **Current Ripple:** Thanks to the STEP-UP/STEP-DOWN converter which performs the recharge and discharge of the connected batteries, the current ripple within the battery is extremely low. This feature eliminates one of the main causes of reduced battery reliability.

3.2. DC/AC Converter



The DC/AC converter (inverter) converts the direct current into stabilized alternating sinusoidal current to supply the load. With the UPS in ON-LINE mode, the load is always powered from the inverter.

The DC/AC converter comprises of a three-phase inverter with IGBT (Isolated Gate Bipolar Transistor) utilizing 3-Level technology.

Voltage regulation

The output voltage is regulated by using independent phase control, a characteristic that allows a better static and dynamic response. In detail:

- Static condition:** the output voltage from the inverter remains within $\pm 1\%$ for all the input supply variations within the permissible limits;
- Dynamic condition:** for load variations from 0 to 100%, the output voltage remains within $\pm 5\%$ and returns to $\pm 1\%$ within 20 ms, as defined by class 1 of standard EN 62040-3.

Frequency regulation

The inverter output frequency is generated autonomously by an internal oscillator in synch with that of the by-pass mains; the frequency stability towards the load therefore depends on the operating conditions:

- Frequency stability
 - With the mains supply available: the internal oscillator follows the variations in frequency of the by-pass supply, according to the set value, which is normally $\pm 2\%$ (can be configured from $\pm 1\%$ to $\pm 6\%$).
 - With no mains supply available: the inverter generates the output frequency autonomously with a stability of $\pm 0.05\%$.
- Speed of frequency variation
The inverter maximum output frequency variation in order to synchronize to the by-pass mains supply is 2 Hz/s for the single a UPS and 1 Hz/s for the parallel version.

Output voltage distortion

The regulation of the inverter guarantees the output voltage distortion with linear loads to within 1% (maximum 2% with the battery at the end of discharge). With non-linear loads, as defined by standard EN 62040-3, the output voltage distortion does not exceed 3%.

Output power

The Inverter is sized to supply 100% of active power with a nominal load PF of 1 within the operational temperature range without any downgrading.

Maxi-J NXE can supply capacitive loads with a PF from 1 to 0.9 without any power downgrading.

Overload

The inverter is sized to supply an overload (kVA) of 110% for 1 hour, 125% for 10 minutes and 150% for 1 minute, across the three phases.

If the time or power limits are exceeded, the load is transferred onto the by-pass supply mains.

Short circuit capacity

In the event of a short circuit within the load and with the power being supplied from the battery, the Inverter can supply two levels of limited current

- 250 kVA: 320 % I_n for 100 ms plus 240% I_n for 900 msec
- 300 & 400 kVA: 270 % I_n for 100 ms plus 200% I_n for 900 msec

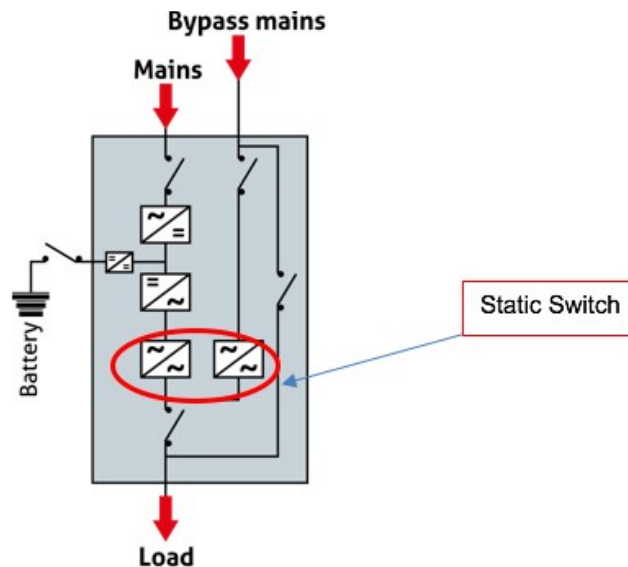
Symmetry of output voltage

During all conditions, the output voltage symmetry is guaranteed to within $\pm 1\%$, with balanced or unbalanced loads (e.g. one phase at nominal load, the other two without load).

Phase displacement

The inverter three phase output voltages are guaranteed with a phase shift angle of $120^\circ \pm 1^\circ$ for 100% balanced and unbalanced loads.

3.3. Static switch



The Static Switch is an electronic device that transfers the load onto the by-pass supply mains without any break in power during the following circumstances:

- manual shutdown of the inverter;
- exceeding the inverter overload limits;
- exceeding the internal overtemperature limits;
- inverter fault;
- DC voltage outside the permitted range.

If at the time of switching the inverter voltage is not in sync with that of the by-pass mains, the transfer takes place with a delay to avoid possible damage to the load. However, this value can be configured in order to meet the needs of the various types of load. Refer to the Technical data table.

By-pass mains voltage

Transfer onto the by-pass mains only takes place if the voltage and frequency are considered “suitable” to power the load. The limits of acceptability are defined by the user in relation to the connected load:

- Voltage window: $\pm 20\%$ (can be configured from $\pm 5\%$ to $\pm 25\%$);
- Frequency window: ± 2 Hz (can be configured ± 1 Hz to ± 6 Hz).

Overload

To guarantee the maximum level of service availability, the static switch does not have any protection against overload. This enables the compatibility with any type of system, commissioning the protection devices externally installed and hence ensuring selectivity.

The UPS Static switch is sized to support the following overloads:

- 110% for 60 minutes
- 125% for 10 minutes
- 150% for 1 minute

The short-circuit capacity may also vary according to the load (refer to the table in the Technical Data section).

3.4. Other features

Operation without neutral

Maxi-J NXE can work with or without the neutral connection. The unit is suitable for the installations where the neutral cable is not distributed but created only at the site load or for applications with 3 load wires only.

Ventilation

The heat dissipation of the internal components is guaranteed by internal fans, the ventilation system includes the features to assure the correct operation in all conditions.

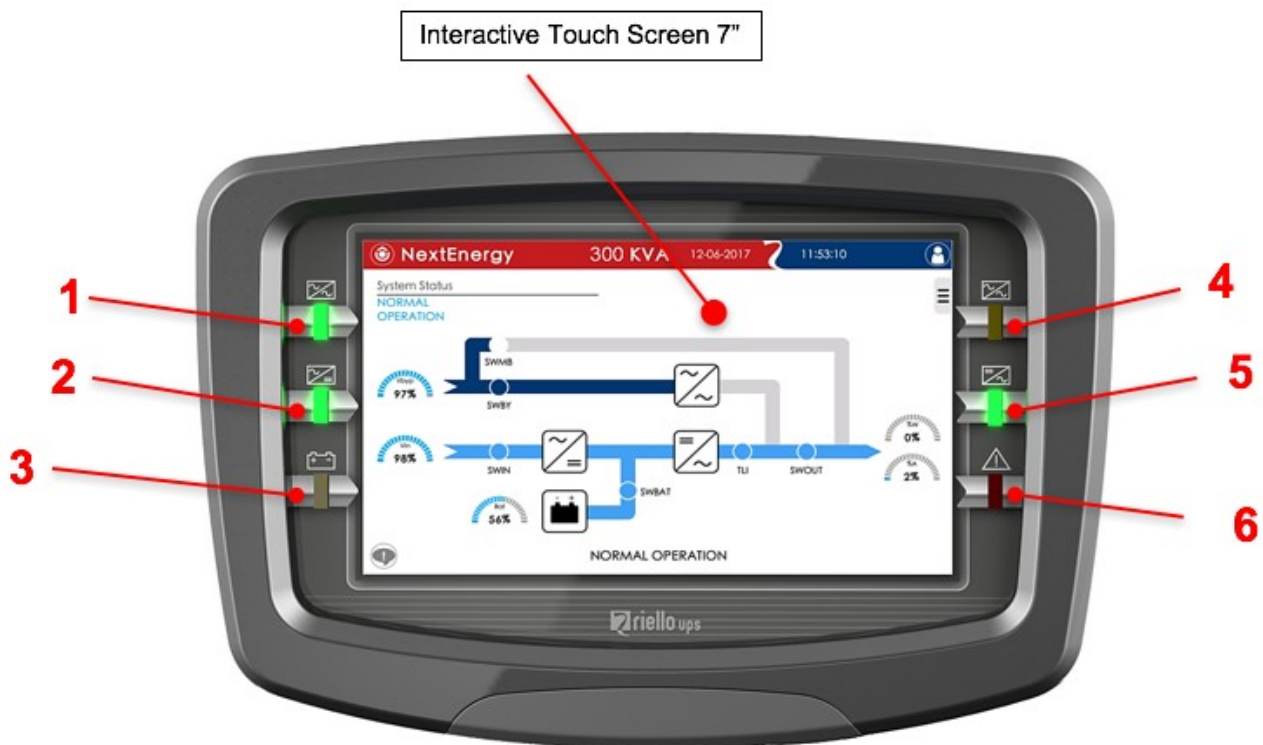
- *Speed control*: the speed of the fans is varied depending on the load level
- *Fan failure alarm*: each fan is monitored individually and in the case of a fan failure an alarm will be raised on the UPS display panel or via a remote monitoring device.
- *Redundant fan*: in case of a failure of one fan the UPS operation is guaranteed up to full load and up to an ambient temperature of 30°C.

4. CONTROL PANEL

The control panel located at the front of the equipment is the user and Service interface used to monitor and control the system status, parameters including the environmental conditions such as the input voltage, load level, temperature, power breaker status and battery conditions. In addition, coloured LED's are available to provide a quick overview of the system status at a glance.

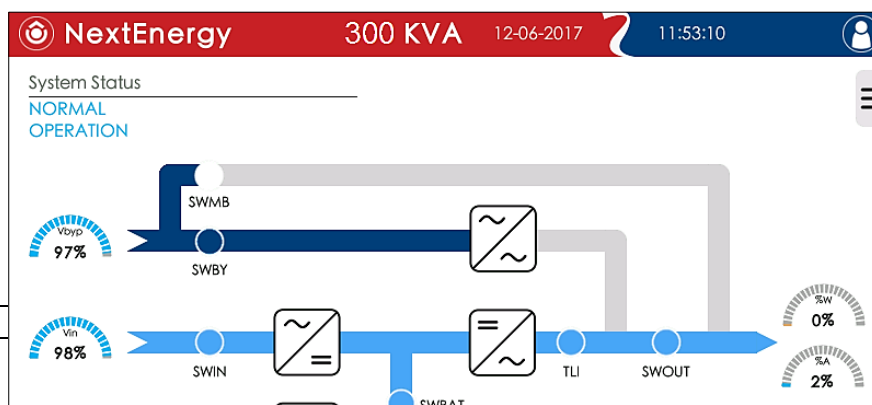
In detail, it is possible to

- Monitor the general status of the UPS
- View the input and output measurements in addition to the individual blocks (Rectifier, Inverter, Static Switch, battery)
- Send the command to switch the UPS ON or OFF, test the battery and/or transfer the load onto the bypass
- Check and modify the main settings with different levels of password
- View the UPS status and alarm list
- Access the oscilloscope function



LED legend					
Led	Symbol	Colour	Function	Status	Description
1		Green	Bypass line	On	Bypass present and within range
				Flashing	Bypass available but outside of the range
				Off	Bypass line not present
2		Green	Rectifier input	On	Main line present and within range
				Flashing	Main line available but outside of the range
				Off	Main line not present
3		Yellow	Battery status	On	Load on battery
				Flashing	Battery low, battery discharging or battery switch open
				Off	Load not on the battery
4		Yellow	Load on Bypass	On	Load on bypass
				Flashing	Load on bypass due to an overload or the maintenance bypass switch is closed.
				Off	Load on Inverter
5		Green	Load on Inverter	On	Load on Inverter and the output switch is closed
				Flashing	Load on Inverter > 100%
				Off	Load on bypass or the output switch is open
6		Red	Alarm	On	Internal failure
				Off	No failure

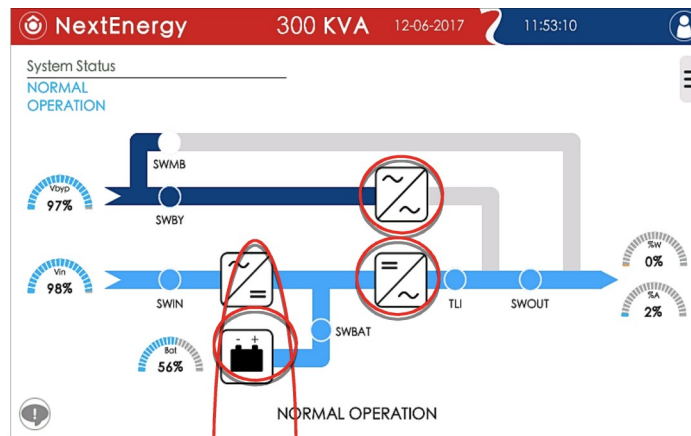
More details are available on the main screen via the block diagram which show the major functional parts, the breakers, the input and output voltages and the battery status.



Blocks		Measurements	
	Rectifier		% di In of the input Rectifier voltage referred to the nominal value
	Inverter		% di In Active output power referred to the nominal value UPS rating % of the output current referred to the nominal value UPS rating
	Static Bypass		% di In of the bypass voltage referred to the nominal value
	Battery		% of the battery charge



By pressing the individual blocks within the diagram the various operational values from around the UPS can be viewed.



Measures 26-06-2017 15:18:24

System Status
NORMAL OPERATION

Rectifier

Voltage	Current
L1-N 224.4V	12.0 A
L2-N 225.2V	L1
L3-N 226.9V	12.9 A
L1-L2 388.8V	L2
L2-L3 390.6V	12.7 A
L3-L1 389.7V	L3
Freq 50.0Hz	Temperature 35.0°C

Vdc 378V, Vbat 377V, Ibat -8.3A

Measures 26-06-2017 15:21:10

System Status
NORMAL OPERATION

Battery Status

Voltage	Current	Temp
380 V	-8.3 A	40.0°C
		Max 50.0°C

Autonomy 25h 09m

Charge 50% charging

Measures 26-06-2017 15:22:57

System Status
NORMAL OPERATION

Inverter

Vdc	Voltage	Current	Power
381V	L1-N 232.0V	2.8 A	0.0 kW
	L2-N 232.0V	0.5 kVA	0.0 PF
	L3-N 232.0V	3.2 A	0.0 kW
	L1-L2 401.8V	9 Apk %	0.7 kVA
	L2-L3 401.8V	9 Apk %	0.0 PF
	L3-L1 401.8V	2.8 A	0.0 kW
		6 Apk %	0.5 kVA
			0.0 PF
			Temperature 35.0°C (Env: 35.0°C)

Vbat 380 V, Ibat -8.3 A, Freq 49.9 Hz

Measures 26-06-2017 15:25:17

System Status
NORMAL OPERATION

Bypass

Input	Output
Voltage	
L1-N 224.0 V	
L2-N 225.0 V	
L3-N 224.0 V	
L1-L2 388.8 V	
L2-L3 388.8 V	
L3-L1 388.0 V	
Freq 49.9 Hz	
Temp 0.0°C	

5. DISCONNECTING SWITCHES

The UPS is equipped with four switches located on the front right hand side of the cabinet accessible by opening the door with a key.

- Rectifier input;
- By-pass mains input;
- Output load;
- Maintenance by-pass.

The battery switch is located inside the battery cabinet or within a dedicated wall mounted panel.

6. UPS CABINET

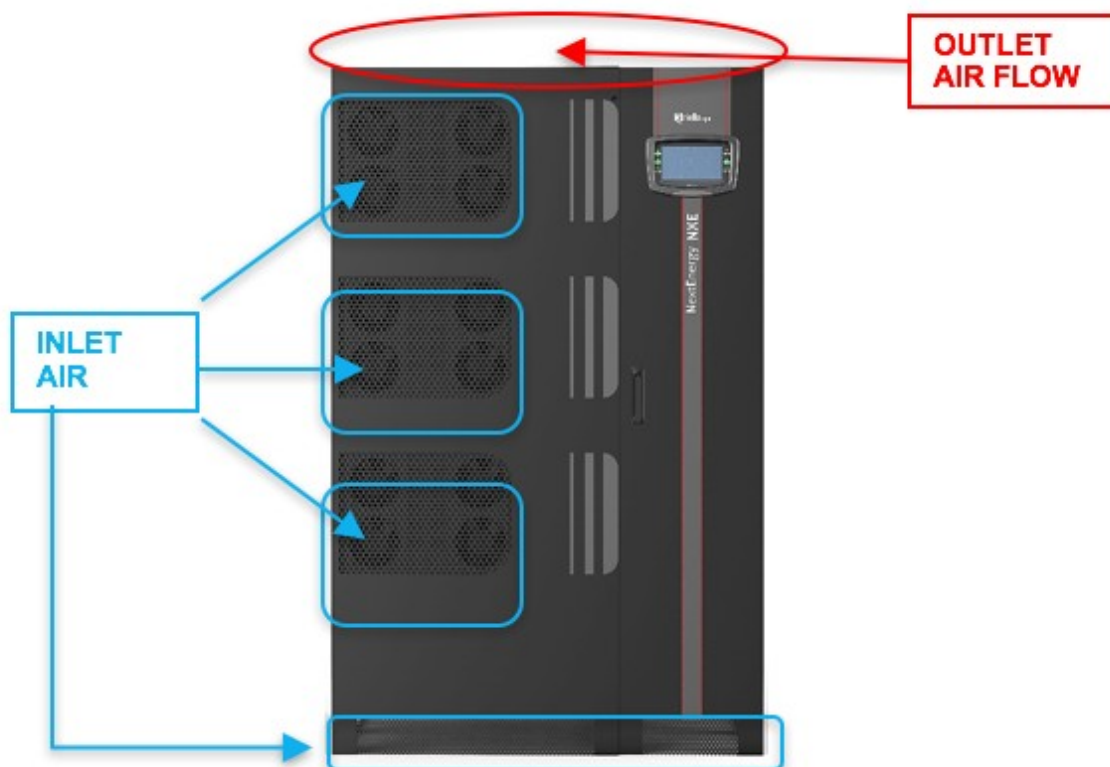
The UPS are designed to provide easy access to all the major components from the front or the top of the cabinet. The heat dissipation of the internal components is provided by the internal fans with the air inlet from the front and the air exhaust from the top.

Consequently, the units do not require any space at the rear of the cabinet for maintenance or ventilation.

The cabinet is manufactured with galvanized steel with different enclosure protection degrees.

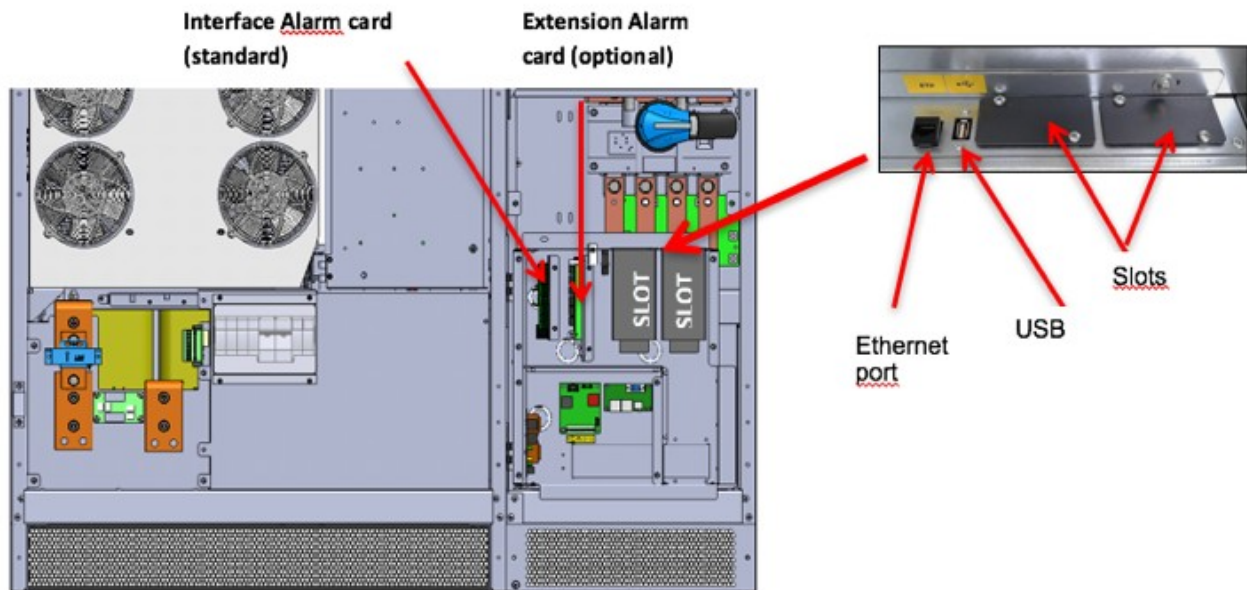
- IP 20
- IP 21 (IP 20 model plus additional option kit to assembly on site)
- IP 31 (specific UPS models with minor power restrictions only for the ratings 300 and 400 kVA)
- IP XX: on request.

The cable entry can be from the bottom or from the top without adding any other additional cabinets.



7. COMMUNICATION

The **Maxi-J NXE** is provided with, a USB port, Ethernet port, Interface Alarm card, Extension Alarm card (optional) and two slots to house optional communication cards.



Interface Alarm card

This card provides

- 2 commands via closed dry contacts + EPO function (via an open dry contact)
- 4 dry switch contacts reporting 4 alarms or operating states of the UPS (max voltage 42Vac/Max 1A)
- Auxiliary Power supply 12 Vdc 100 mA max (for an external circuit)

Here is a list of the commands and the factory default alarms, these can be customised during the commissioning.

Commands

- Emergency Power OFF: normally closed
- Inverter Power OFF: normally open (close the contact for approximately 2 seconds to activate)
- Battery Charger Disable: normally open (close the contact for approximately 2 seconds to activate)

Alarms

- Bypass ON: Load on bypass or Inverter failure
- Battery ON: Load on battery (i.e due to a mains failure)
- Battery Low: Battery pre-alarm end of discharge (default 5 minutes, adjustable)
- Common alarm: (i.e overtemperature or overload)

7.1. Emergency Power Off (E.P.O.)

In the event of an emergency the UPS can be completely shut down by an external command.

7.2. Monitoring software

The system is provided with **Powershield**³ monitoring and control software with the following features:

- Event log;
- Total events management;
- E-mail, modem, SNMP Agent support;
- Sequential shutdown of all the PCs in the network, saving the active work of the most varied applications.

8. OPTION

8.1. Communication

The UPS is provided with two slots to house the following communication options:

NetMan 204: the NetMan network agent provides UPS management across a LAN using any of the main network communication protocols TCP/IP, HTTP, HTTPS and network interface SNMP v1 and v3. NetMan enables the easy integration of the UPS into most medium and large sized networks and provides reliable communications between the UPS and the management systems employed.

MultiCom 302: a Modbus/Jbus protocol converter over RS232 or RS485 output for monitoring the UPS, for example, from a BMS (Building Management System). It also provides a second independent RS232 serial line that can be used by other devices such as a NetMan or PC.

MultiCom 352: this is a serial duplexer that enables two devices to be connected to a single serial port on a UPS. It can be used where numerous serial connections and multiple UPS polling is required and is ideal for LAN networks with a firewall.

Other communication options not fitted into the slots.

- a)** Multi I/O has configurable input and output signal contacts to allow UPS integration with many control systems. It can be used to connect two devices to a single UPS serial communication port. It can also communicate using the MODBUS/JBUS protocol over RS485 lines. (this option is not fitted inside the UPS module)
- b) I/O Expansion board** (1 A, 48 Vac) for connecting a remote-control device. The following default alarm signals are available:
 - a. Load on inverter;
 - b. Load on mains power;
 - c. Low battery;
 - d. Overload;
 - e. Over-temperature;
 - f. Load on maintenance by-pass.

There are also two programmable inputs for: "battery charger inhibit" and "by-pass inhibit" which can be used when the UPS is connected to a generator-set.

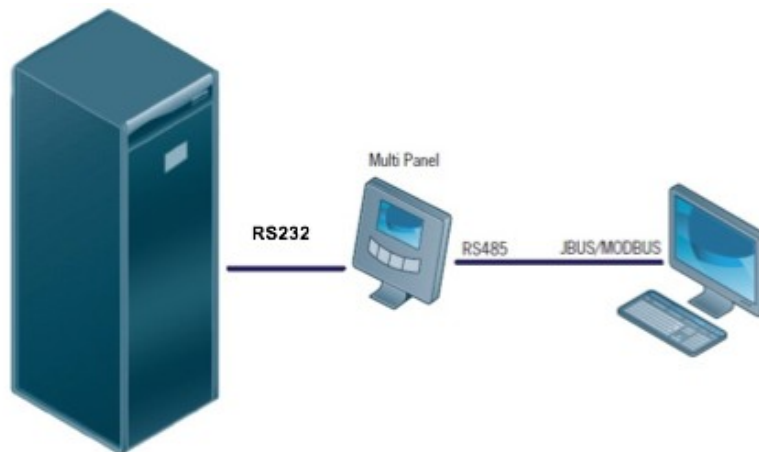
The Alarms and the commands can be customised using the Touch Screen display, refer to the UPS user manual for the complete list of alarms and the commands available.

Note: the complete and updated list of options is available on our [website: www.adpos-ups.de](http://www.adpos-ups.de)

8.2. Remote graphic panel

The remote graphic panel provides a means of displaying the UPS's operational information, measurements and alarms at a remote location. In addition, the panel is provided with an RS485 port which provides the same information in a JBUS/MODBUS protocol for the BMS. As Maxi-J NXE does not have an RS232 port as standard, an additional MultiCOM 352 is required.

The maximum distance between the UPS and the remote panel is approximately 300 m.



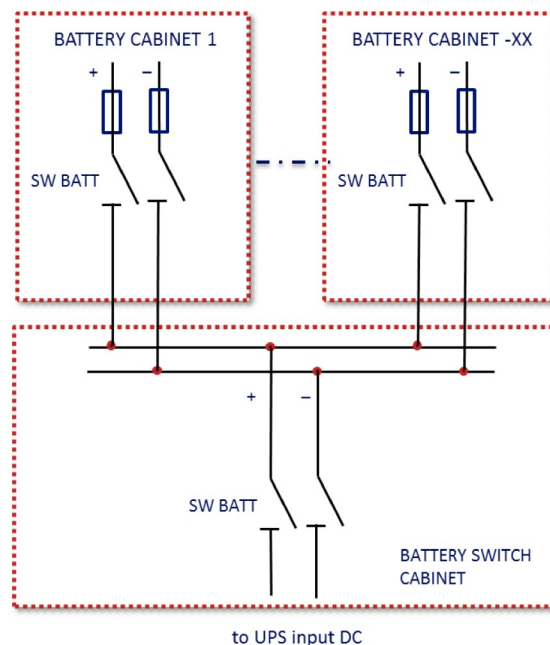
8.3. Battery cabinet

The battery cabinets are available with the following characteristics:

- Protection fuses and switched isolator;
- Protection degree of IP20 with the front door open;
- Complete with batteries or empty with connection cables between the compartments (cells).

The dimensions are (W x D x H): 860 x 800 x 1900 mm, weight 200 kg (empty).

The battery cabinets can be connected in parallel to achieve the required autonomy; for more than 2 cabinets in parallel, it is advisable to add a single battery switch cabinet where the paralleling of the cables can be connected.



8.4. UGS - UPS Group Synchroniser

This enables 2 systems to be connected in a “**DUAL BUS**” configuration to keep them synchronised with each other during any variation in the mains supply voltage, including total failure. The UGS also enables a AdPoS to be synchronised with any other power source or to an independent non AdPoS system, even one of different power rating.

The UGS box is designed to be wall-mounted:

- Dimensions (W x D x H): 236 x 135 x 316 mm
- Weight: 2 kg

8.5. Isolating transformers

Cabinets with a delta/star bypass isolation transformer are available. Such transformers can also be used to recreate the power supply neutral when this is not present within the mains supply.

In the case of installations with an external maintenance bypass, please contact your local distributor.

8.6. Voltage adaptation

Upon request, the UPS can be provided with different input and output voltages according to the requirements.

For more information, please contact your local distributor.

8.7. Protection levels

The UPSs can be provided with varying levels of cabinet protection over IP20 in accordance with standard EN 60529.

8.8. Environmental sensors

The environmental sensors are devices which are connected to the Netman 204 communication card, in order to monitor the temperature and humidity of the environment where installed. In addition, they can be equipped with digital inputs and outputs which can be configured as required.

The available sensors are:

- Temperature: monitors ambient temperature
- Humidity & temperature: monitors the relative humidity percentage and ambient temperature in °C.
- Digital I/O & Temperature: monitors the ambient temperature in °C and is equipped with a digital input and output contact.

a)

9. ENVIRONMENTAL REQUIREMENTS

Ambient temperature for the UPS	0 - 40° C
Maximum temperature for 8 hours a day	40° C
Average temperature for 24 hours	35° C
Recommended battery temperature	20 - 25° C
Range of relative Humidity	5 - 95% (without condensing)
Maximum Operating Altitude	Up to 1000m o.s.l. (derating of 1% for each 100m between 1000 and 4000m)
Storage Temperature	From -25°C up to 60 °C (UPS) -15, +40°C (for the batteries)

10. TECHNICAL DATA UPS 250 to 400 KVA

Mechanical Data	UPS Size (kVA)		
	250	300	400
Width (mm)	1200		1400
Depth (mm)	850		
Height (mm)	1900		
Net Weight (Kg)	880	880	1100
Shipping dimension (WxDxH)	1300 x 950 x 2100		1650 x 1100 x 2100
Cooling	Forced air via speed controlled internal fans		
Shipping Weight (Kg)	915	915	1160
Level of cabinet protection	IP20 (higher levels of protection on request)		
Input cables	From the bottom or top		
Colour	RAL 7016		

Electrical Data	UPS Size (kVA)		
	250	300	400
INPUT			
Rated Voltage	400 Vac 3Ph without Neutral		

Rated Voltage tolerance (%) without battery sharing and according to the load level	+20%, -10% (100% load) +20%, -20% (85%load) +20%, -30% (75%load) +20%, -40% (65%load)		
Rated Frequency (Hz)	50/60 Hz		
Input frequency tolerance	from 45 to 65 Hz		
Rated current absorbed at rated voltage [A]	380	458	610
Rated power absorbed at rated voltage [kVA]	264	317	423
Max current absorbed at full load and battery in recharge [A]	435	500	681
Input Power Factor at rated voltage with battery in recharge (from 25% to 100% load)	>0.99		
Current Harmonic distortion (THDi) with mains THDV < 1% <ul style="list-style-type: none"> • Load 100% • Load 75% • Load 50 % • Load 25 % 	<3% <3% <5% <8%		
Progressive start of rectifier (Power Walk-in Duration)	from 0 to 120 second (Configurable)		
Delay of Progressive start of rectifier (Power Walk-in Start delay)	from 0 to 120 second (Configurable)		

Electrical Data	UPS Size (kVA)		
	250	300	400
D.C. INTERMEDIATE CIRCUIT			
Number of lead cells / Battery blocks (see note 1)	240 (40 batteries)		
Rated battery voltage (Vdc)	480		

Ripple current with recharged battery (%)	Approx. 0		
Float voltage (2.26 V/el., configurable) – Vdc	542		
Recharge Voltage (2.4 V/el., configurable) – Vdc	576		
Maximum output voltage (Vdc)	600		
End of discharge voltage Vdc (1.6 V/el, can be calibrated) - Vdc	384		
Voltage compensation with reference to the battery cabinet temperature (V per °C)	-0.11%		
Maximum current to charge battery with 240 elements (mains voltage 400 V) [A]			
• Load 100%	50	55	90
• Load 90%	100	120	160
• Load 80%	145	170	235
• Load ≤70%	190	225	300

Electrical Data	UPS Size (kVA)		
	250	300	400
INVERTER			
Rated Power [kVA]	250	300	400
Rated active Power [kW]	250	300	400
Nominal Current [A]	361	433	577
Rated Voltage	400 V 3Ph + N (configurable from 360 V to 420 V)		
Rated Frequency	50 or 60 Hz (configurable on site)		
Output Rated voltage regulation	From 360 to 420 V		

Static variation	±1%	
Dynamic variation	±5%	
Recovery time to within ±1%	20ms - Conform to the standard EN 62040-3, class 1	
Crest current factor (as per EN 62040-3)	3:1	
Voltage distortion with linear load	≤1% (typical), ≤2% (max)	
Voltage distortion with non-linear load	≤3%	
Frequency stability with the inverter synchronised to the by-pass mains.	±2% (configurable via the display panel from ±1% to ±6%)	
Frequency stability with the inverter not synchronised to the by-pass mains.	±0.05 %	
Speed of frequency variation	1 Hz/sec (see note 2)	
Dissymmetry of the phase voltage with balanced or unbalanced load.	≤1%	
Voltage phase shift with balanced or unbalanced load.	120 ± 1°el	
Overload referred to the rated power	110% for 60 minutes, 125% for 10 min, 150% for 1 min.	
Short circuit current (I/I _{rated})	3.2 for 100 msec. + 2.4 for 900 msec.	2.7 for 100 msec. + 2.0 for 900 msec.
Battery mode efficiency (%)	96	

Electrical Data	UPS Size (kVA)	
BY-PASS		
Rated voltage	400 Vac 3ph + N (configurable from 360 V to 420 V)	
Rated voltage tolerance	±20% (configurable from ±5% ± 25% from Control Panel)	
Rated frequency	50 or 60 Hz (auto sensing)	
Rated frequency tolerance	±2% default (settable from ±1% up to ± 6% from Control Panel)	
Switching to by-pass with the Inverter synchronised (UPS in "Normal Mode")	<1 msec.	
Switching to by-pass with the Inverter not synchronized (UPS in "Normal Mode")	~100 msec. (configurable for extended times)	
Switching from by-pass to Inverter (UPS in "Stand-by On mode")	4 msec.	

Overload capacity of the by-pass line (kVA)	110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute		
Short circuit capacity of the by-pass line (x nominal current)			
• 1 second	12	10	7,5
• 500 msec.	14	12	9,0
• 200 msec.	15	13	9,5
• 100 msec.	16	14	10,5
• 10 msec.	18	15	11,5

Electrical Data	UPS Size (kVA)		
	250	300	400
SYSTEM			
Efficiency AC/AC (system on line) [%]			
• Load 100%	96.1	95.7	95.7
• Load 75%	96.4	96.4	96,2
• Load 50%	96.6	96.6	96.5
• Load 25%	95.5	96.0	96,0
Efficiency system in STAND-BY mode [%]			
• Load from 50 to 100%		99	
Neutral size (I/rated current)	1.38	1.15	1.38
Dissipated Power Without load			
• [kW]	1.5	1.5	1,8
• [kcal/h]	1290	1290	1550
• [BTU/h] see note 3	5118	5118	6145
Dissipated Power With 50% of load			

• [kW]	4.4	5,3	7.3
• [kcal/h]	3783	4540	6235
• [BTU/h] see note 3	15012	18014	24750
Dissipated Power With 100% of load			
• [kW]	10.1	13,5	18,0
• [kcal/h]	8724	11590	15455
• [BTU/h] see note 3	34619	45994	61330
Maximum current dispersion	300 mA max		
Acoustic noise level at 1m from the front (from 0 to full load) [dbA]			
• Load 50 %	63		
• Load 100%	70		

Notes

- (1) The number of Pb elements can vary from 222 to 258.
(2) The parallel version can be configured from 0.1 to 1 Hz/s.
(3) 3.97 BTU = 1kcal.

11. TECHNICAL DATA UPS 250 to 400 KVA IP31

Mechanical Data	UPS Size (kVA)		
	250 IPI31	300 IPI31	400 IPI31
Width (mm)	1370		1565
Depth (mm)	1060		
Height (mm)	2210		
Net Weight (Kg)	920	920	1160
Shipping dimension (WxDxH)	1650 x 1100 x 2100		
Cooling	Forced air via speed controlled internal fans		
Shipping Weight (Kg)	970	970	1210
Level of cabinet protection	IP31		
Input cables	From the bottom or top		
Colour	RAL 7016		

Electrical Data	UPS Size (kVA)		
INPUT			
Rated Voltage	400 Vac 3Ph without Neutral		
Rated Voltage tolerance (%) without battery sharing and according to the load level	+20%, -10% (100% load) +20%, -20% (85%load) +20%, -30% (75%load) +20%, -40% (65%load)		
Rated Frequency (Hz)	50/60 Hz		
Input frequency tolerance	from 45 to 65 Hz		
Rated current absorbed at rated voltage [A]	380	411	548
Rated power absorbed at rated voltage [kVA]	264	285	380
Max current absorbed at full load and battery in recharge [A]	435	460	621
Input Power Factor at rated voltage with battery in recharge (from 25% to 100% load)	>0.99		
Current Harmonic distortion (THDi) with mains THDV < 1% <ul style="list-style-type: none"> • Load 100% • Load 75% • Load 50 % • Load 25 % 	<3% <3% <5% <8%		
Progressive start of rectifier (Power Walk-in Duration)	from 0 to 120 second (Configurable)		
Delay of Progressive start of rectifier (Power Walk-in Start delay)	from 0 to 120 second (Configurable)		

Electrical Data	UPS Size (kVA)		
	250	300	400
D.C. INTERMEDIATE CIRCUIT			
Number of lead cells / Battery blocks (see note 1)	240 (40 batteries)		
Rated battery voltage (Vdc)	480		
Ripple current with recharged battery (%)	Approx. 0		
Float voltage (2.26 V/el., configurable) – Vdc	542		
Recharge Voltage (2.4 V/el., configurable) – Vdc	576		
Maximum output voltage (Vdc)	600		
End of discharge voltage Vdc (1.6 V/el, can be calibrated) - Vdc	384		
Voltage compensation with reference to the battery cabinet temperature (V per °C)	-0.11%		
Maximum current to charge battery with 240 elements (mains voltage 400 V) [A]			
• Load 100%	50	55	90
• Load 90%	100	120	160

• Load 80%	145	170	235
• Load ≤70%	190	225	300

Electrical Data	UPS Size (kVA)		
	250	300	400
INVERTER			
Rated Power [kVA]	250	300	400
At cosφ	1	0,9 lag	0,9 lag
Rated active Power [kW]	250	270	360
Nominal Current [A]	361	433	577
Rated Voltage	400 V 3Ph + N (configurable from 360 V to 420 V)		
Rated Frequency	50 or 60 Hz (configurable on site)		
Output Rated voltage regulation	From 360 to 420 V		
Static variation	±1%		
Dynamic variation	±5%		
Recovery time to within ±1%	20ms - Conform to the standard EN 62040-3, class 1		
Crest current factor (as per EN 62040-3)	3:1		
Voltage distortion with linear load	≤1% (typical), ≤2% (max)		
Voltage distortion with non-linear load	≤3%		
Frequency stability with the inverter synchronised to the by-pass mains.	±2% (configurable via the display panel from ±1% to ±6%)		
Frequency stability with the inverter not synchronised to the by-pass mains.	±0.05 %		
Speed of frequency variation	1 Hz/sec (see note 2)		

Dissymmetry of the phase voltage with balanced or unbalanced load.	≤1%		
Voltage phase shift with balanced or unbalanced load.	120 ± 1°el		
Overload referred to the rated power	110% for 60 minutes, 125% for 10 min, 150% for 1 min.		
Short circuit current (I/ rated)	3.2 for 100 msec. + 2.4 for 900 msec.	2.7 for 100 msec. + 2.0 for 900 msec.	2.7 for 100 msec. + 2.0 for 900 msec.
Battery mode efficiency (%)	96		

Electrical Data	UPS Size (kVA)		
BY-PASS			
Rated voltage	400 Vac 3ph + N (configurable from 360 V to 420 V)		
Rated voltage tolerance	±20% (configurable from ±5% ± 25% from Control Panel)		
Rated frequency	50 or 60 Hz (auto sensing)		
Rated frequency tolerance	±2% default (settable from ±1% up to ± 6% from Control Panel)		
Switching to by-pass with the Inverter synchronised (UPS in "Normal Mode")	<1 msec.		
Switching to by-pass with the Inverter not synchronized (UPS in "Normal Mode")	~100 msec. (configurable for extended times)		
Switching from by-pass to Inverter (UPS in "Stand-by On mode")	4 msec.		
Overload capacity of the by-pass line (kVA)	110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute		
Short circuit capacity of the by-pass line (x nominal current)			
• 1 second	12	10	7,5
• 500 msec.	14	12	9,0
• 200 msec.	15	13	9,5
• 100 msec.	16	14	10,5
• 10 msec.	18	15	11,5

Electrical Data	UPS Size (kVA)		
	250	300	400
SYSTEM			
Efficiency AC/AC (system on line) [%]			
• Load 100%	96.1	95.7	95.7
• Load 75%	96.4	96.4	96,2
• Load 50%	96.6	96.6	96.5
• Load 25%	95.5	96.0	96,0
Efficiency system in STAND-BY mode [%]			
• Load from 50 to 100%		99	
Neutral size (I/rated current)	1.38	1.15	1.38
Dissipated Power Without load			
• [kW]	1.5	1.5	1,8
• [kcal/h]	1290	1290	1550
• [BTU/h] see note 3	15012	5118	6145
Dissipated Power With 50% of load			
• [kW]	4.4	4.8	6.5
• [kcal/h]	3783	4086	5615
• [BTU/h] see note 3	15012	16213	22276
Dissipated Power With 100% of load			
• [kW]	10.1	12.1	16.2
• [kcal/h]	8724	10431	13918
• [BTU/h] see note 3	34619	41395	55195
Maximum current dispersion	300 mA max		
Acoustic noise level at 1m from the front (from 0 to full load) [dba]			
• Load 50 %		63	
• Load 100%		70	

Notes

- (1) The number of Pb elements can vary from 222 to 258.
- (2) The parallel version can be configured from 0.1 to 1 Hz/s.
- (3) 3.97 BTU = 1kcal.

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