made in EEC

Aunilec®






heavy duty industrial solutions

since 1973

www.aunilec.com

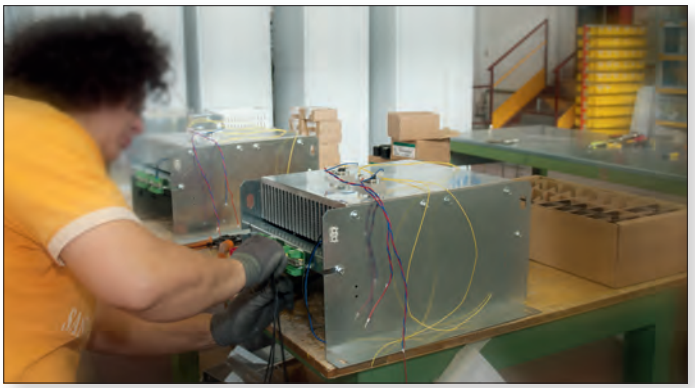
Aunilec®

power solutions

performance · reliability · flexibility

Our production

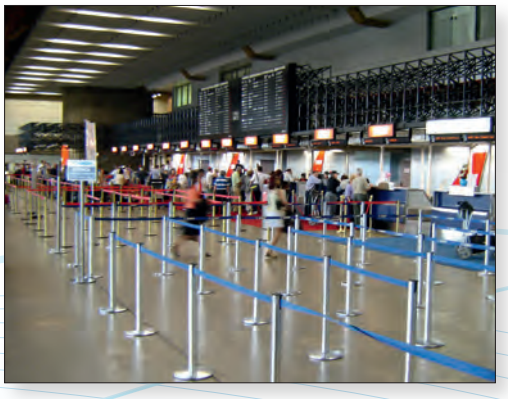
AUNILEC'S production is located in Verona - Italy; thanks to a modern plant and automated processes we secure high production capabilities. Important investments have been made to meet customers' most different needs and guarantee prompt delivery performances.



Customised solutions

Thanking to 40 years acquired experience and technical know-how, our partner is offering customised solutions addressed to the industrial market.
Customers' specifications are expertly analysed since the proposal stage. Detailed and explanatory proposals are submitted for customer easy scrutiny.
Our partner provides the following proposal estimation services:

- Comprehensive technical and commercial offers
- Consultancy and design studies
- Drawing up of documentation upon request
- Expediting and testing during installation
- Final testing with customer attendance
- Commissioning supervision and start up



Applications

We are specialised to serve the following application fields:

· Oil & Gas/Petrochemical
· Utilities & Power Generation
· Transports
· Automation and industrial processes
· Telecommunications
· Information Technology

We have been supplying energy since 1973

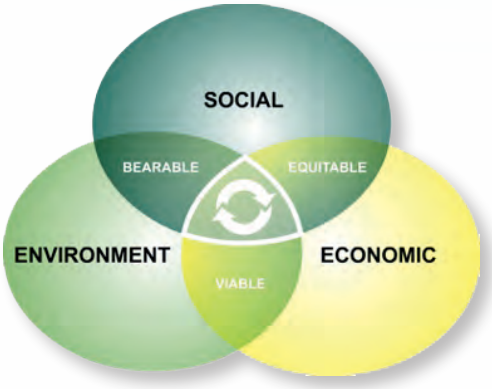
Our partner was founded in 1973 designing and manufacturing AC/DC power supplies for industrial use. Since the beginning, the Company has been managed to meet demanding requirements from prime Customers such us, Engineering Companies, both Italians and international.

We, always Customer oriented: The capability of listening market requests, the progressive technology innovation, the selection of best components and suppliers, the strong commitment secured by the employment staff and business partners, the strict implementation of ethical codes of conduct, are at the core of our philosophy.

All these principals allow us to create increasingly sophisticated safe and reliable systems and to reach those markets, always looking for high-tech products guaranteed by high quality standards.

Environmental sustainability is our main aim

We invest many resources to try minimize the environmental impact of its technologies
and products, transferring this experience to its customers and suppliers while trying to ensure that its production processes are environment-friendly and allow to save energy.
Energy saving is rooted in the products, systems and services Our supplies along the whole production chain, from the assembly of the materials to electronic testing.
We recognize the importance of environment protection and we strive to build an environmentally sustainable future. Our management also takes great care to ensure the long-term business profitability, being well aware that only constant reinvestment of the revenues and a careful administration of the available resources can guarantee the company's survival and prosperity.



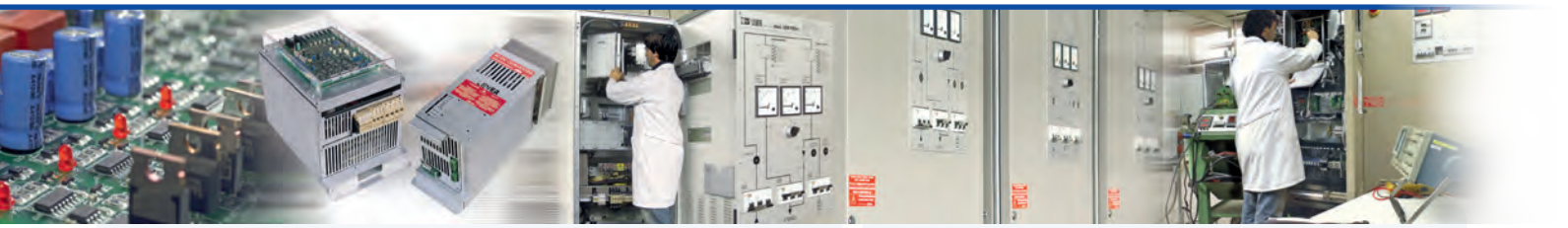
The quality value: from design to testing

The entire range of **AUNILEC** products is designed in strict respect of International Standards.

Compliance to Electromagnetic Compatibility (EMC), Performance and Safety, as per European Union Directive (EEC) and International Electro-Technical Commission (IEC), is secured.

Testing is the essential stage of the manufacturing process and it ensures the product to be in respect of the above musts and in line with our design goals too.

Our partner technical staffs verify also the product under the supervision of Customers and/or Customers appointed Certification Bodies. All activities are executed in accordance with the ISO 9001 - VISION 2000 rules. The drawn up of technical test reports is provided along with the list of used certified instruments set too.



Sturdiness and performances: our philosophy

Aunilec products are designed to stand the harshest operating and environmental conditions. We meet the strictest requirements in terms of quality, reliability and efficiency. Any kind of Client customisation request is implemented but to be in respect of International Standards and physical concepts too.
Our Power Converters provide exceptional reliability and extraordinarily extended MTBF (Mean Time Between Failure) secured by the adoption of conservative design methods, control logics redundant supplies, constant cooling monitoring and failure predicting systems.
The use of DSP+PLD digital technology, the intelligent failure detection interface with integrated remote monitoring facilities, the modular/ergonomic front design access design, let our products to tremendously reduce the MTTR (Meant Time To Repair).


IQNet
THE INTERNATIONAL CERTIFICATION NETWORK
CERTIFICATE
Whole Company
Rectifiers-UPS AC and DC for auxiliary services and emergency lights – Energy Solutions for telecommunications – Traction battery chargers – Metal light carpentery – Electrical BT Transformers
Management System
ISO 9001:2000

The numbers that make difference

Let's have a look to the numbers: our partner has two production centres, organised by specialisation areas and production type.
Production centre:
- 4,300 sq m Production and material storage
- 800 sq m offices
- 500 sq m Testing room

Our company has recently expanded, adding new offices to the facility.

Aunilec: when organisation becomes efficiency

Flexibility and broadly distributed staff skills, are the recipe of our success.
Periodic upgrading and updating training courses are provided to the personnel to secure to the Company, the best possible human resources asset.

The Company strength is the flexible structure and the highly specialized personnel skills. In that respect, the staff is constantly trained and accustomed to work in team so to deliver an increasingly efficient and competent service. Great human assets and an unmatched broadly distributed know-how allow the company to promptly and efficiently fulfil customer requests and design customised products according to technical specifications.
From our R&D centre to the after-sale service, people life motive is the awareness of being a reference point for others. Company functions are then, closely interacting each other securing to the process optimal continuity and avoiding gaps of competences.
Below the Company Functions details:

Project oriented functions:
- Sales dpt
- Proposal dpt
- System Engineering dpt
- Purchase dpt
- Manufacturing dpt
- Testing dpt
- Logistic dpt
- Service dpt

Process support functions:
- R&D dpt
- Account and Administration dpt
- Quality dpt

Oil & Gas

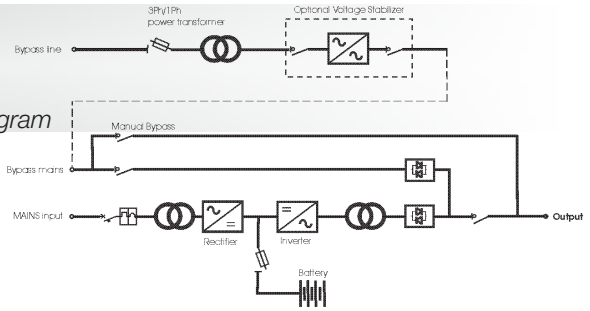
Static UPS units

Aunilec®

DPS

Double rectifier 125 Vdc 1250A
Double inverter 125 Vdc 100KVA
Change over switchboard
installed in Hassi R Mell Solar Plant
(Algerian desert)

One line Diagram



Main features:

- Clean and stable DC on battery with ripple voltage peak-peak value <1%
- Pure VFI-SS-III output sinusoid wave as provided for by the IEC/CEI EN 62040 standards
- Redundant fan system with temperature and air flow control
- 5 automatic charging modes
- Manual charging mode for open cup batteries
- Adjustable times and alarm thresholds
- Temperature compensation programmable on the charging voltage to extend the battery life.
- Double digital microprocessor control (DSP + PLD) for rectifier and inverter, ensuring maximum reliability
- Full optical isolation on all the logic and interface cards.
- Modbus communication interface through RS232 or RS485 port.
- Ethernet connectivity.
- Optional FALCON battery control system.
- Separate DSP for rectifier and inverter to improve reliability.

High flexibility, allowing our equipment to adapt to all system features

The DPS is suitable for a wide range of applications in the most demanding industrial environments. It allows to achieve complex system architectures to ensure maximum power availability with a wide range of accessories and optional. We can supply redundant N+1 or HOT STANDBY configurations. Thanks to the new our DIGITAL TECHNOLOGY, you can choose different alarms with voltage-free contacts, with a wide range of LED indications and accurate digital measurements.

DSP board
with Modbus
communications

Furthermore a graphical display shows measurements, alarms and a one-line diagram to help the operator to better understand the situation. The digital inputs can be customised according to specific customer needs, allowing to take into account special system statuses and to display them on the monitor. The display can store the alarm list and an event history.

You can adapt the DPS to the technical specifications. Should you need any particular applications and customised solutions, please contact AUNILEC.

Absolute reliability and performance

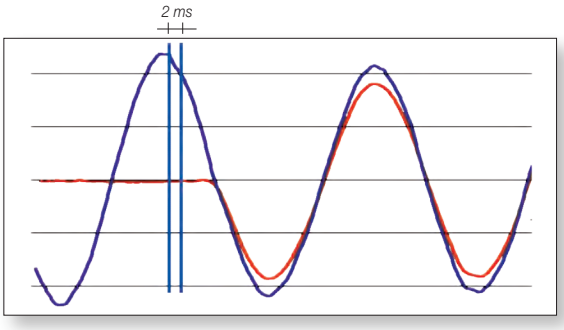
Touch screen display

To ensure its compatibility with the most demanding applications, the Aunilec DPS system can withstand a high short-circuit current, in order to guarantee the selectivity of the downstream protections. The fully DIGITAL microprocessor logic controls the power conversion, supervises operation, supports the system and modifies the parameters in case of component failure to assure power supply to the load.
If the load is highly distorted, the high frequency switching and the DPS loops support the system by keeping THD low. The Aunilec digital UPS units are fitted with a modern IGBT technology and a PWM modulation allowing to obtain a pure sinusoid output wave as required by the strictest standards contained in IEC EN 62040 class VFI-SS-III.

Ventilation may be redundant, allowing to keep a rated output load only using one half of the fans. The air flow sensors detect the ventilation drop and immediately trigger an alarm, allowing to replace the damaged fan.

Low consumption levels

Thanks to component sizing, the UPS systems can reach high efficiency levels even with low DC bus voltages.
The selectable Line Interactive mode may be used in stable environments to achieve very high efficiency levels (~98%) in case of inverter power supply failure, and when synchronised with the mains it can take on the load in less than 1ms.



The image above shows the curves of the actual inverter current (red) and of the UPS output voltage (blue) as load is switched during a mains failure in Line Interactive mode. The interval is minimal. If the UPS operates in ON LINE mode, there is no interval in case of mains failure.

DPS: AUNILEC UPS industrial systems

DPS provides maximum protection for all mission-critical industrial applications thanks to an exceptional mechanical and electrical design. The DPS operates from 10 to 200kVA and uses an ON-LINE double conversion technology (VFI) with an isolation transformer on the inverter output.

Power is constantly supplied to the load by the inverter with a filtered, stabilised and regulated sinusoid wave.

The EMI input and output filters considerably increase the load immunity from noise or temporary mains overcurrents.

The DPS may be supplied along with an optional control software and can be remotely controlled through a serial or Ethernet interface.

Battery management system: maximising life

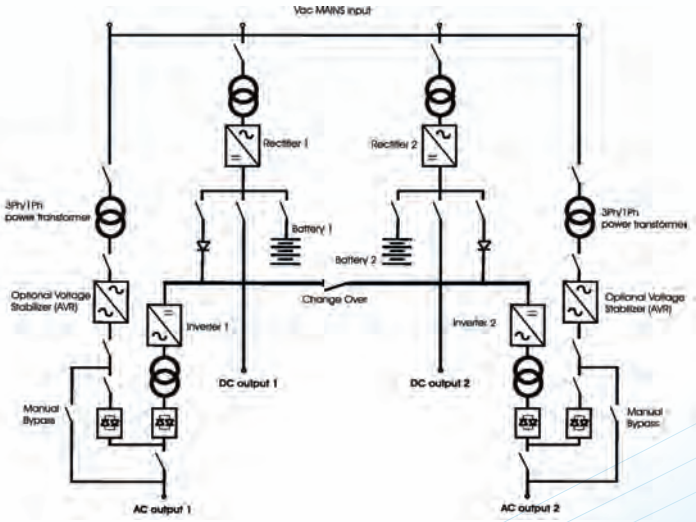
When the system is powered by the mains, the UPS recharges the batteries. In case of mains failure power is supplied to the inverter from the batteries. Efficient battery management, therefore, is essential for the UPS yield in case of emergency. Battery management consists of a set of features designed to ensure excellent yield and prolong the battery life:

- Double level charging, to optimise the charging currents and reduce the charging time.
- Four automatic charging modes, with different current management in compliance with the provisions set forth by the strictest standards.
- Programmable temperature compensation and discharge protection to reduce general battery ageing.
- Manual charging mode for the commissioning of any battery type.
- Intelligent and schedulable battery testing, for the identification of potential battery deterioration and failure.
- The voltage values, the times and the alarm thresholds can be programmed directly by the user through multilevel passwords.
- The UPS may be installed in any distribution system (the rectifier input neutral is not required).

The DPS is compatible with all battery types:

- Open cup acid lead
- AGM / GEL
- Ni-Cd batteries

UPS System integrated



Applications

· Oil & Gas/Petrochemical

· Utilities & Power stations

Reference standards
- IEC/CEI
- GOST/NEMA

Model	Voltage Battery	Output Voltage	Power
DPS TM 005/11	110Vdc	230Vac / 115Vac 1PH	5kVA
DPS TM 010/11	110Vdc		10kVA
DPS TM 015/11			15kVA
DPS TM 020/11			20kVA
DPS TM 030/11			30kVA
DPS TM 040/11			40kVA
DPS TM 050/11			50kVA
DPS TT 010/11	110Vdc	400Vac / 190Vac 3PH	10kVA
DPS TT 015/11			15kVA
DPS TT 020/11			20kVA
DPS TT 030/11			30kVA
DPS TT 040/11			40kVA
DPS TT 050/11			50kVA
DPS TM 005/22	220Vdc	230Vac / 115Vac 1PH	5kVA
DPS TM 010/22			10kVA
DPS TM 015/22			15kVA
DPS TM 020/22			20kVA
DPS TM 030/22			30kVA
DPS TM 040/22			40kVA
DPS TM 050/22			50kVA
DPS TM 060/22			60kVA
DPS TM 080/22			80kVA
DPS TM 100/22			100kVA
DPS TT 010/22	220Vdc	400Vac / 190Vac 3PH	10kVA
DPS TT 015/22			15kVA
DPS TT 020/22			20kVA
DPS TT 030/22			30kVA
DPS TT 040/22			40kVA
DPS TT 050/22			50kVA
DPS TT 060/22			60kVA
DPS TT 080/22			80kVA
DPS TT 100/22			100kVA

(Other size on request)

OTHER TECHNICAL CHARACTERISTICS

INPUT ELECTRIC PARAMETERS

Input frequency	50 / 60 Hz
Frequency range	±10%
Input voltage	400 Vac 3PH
Input voltage range	±10%
Input THD	27% with 6P, 12% with 12P, 6% with 12P + THD filter
Temperature compensation, 3 probes	0/-0,3V/°C
Ripple	<1%

OUTPUT ELECTRIC PARAMETERS

Overload 110/125/150%	2h/10'/10"
Output sinusoid distortion	<2% (VFI-SS-III class in compliance with the IEC/CEI EN 62040 standard)
Dynamic stability	-8%/+13% restoration to ±1% in 80ms
Static switch switching	<1ms

COMMUNICATIONS

Remote signalling	Voltage-free relays
Remote controls	ON/OFF switches, Manual charging, Temp. probes
Communication	Modbus protocol through RS485 DB9 serial port; TCP/IP

ENVIRONMENT

Cooling	Forced
Operating conditions	-5/+40°C, 93% Humidity (without condensation)
Noise	55 to 63 dB (depending on size)

MECHANICS

Metal frame thickness	2.5mm
Metal panel thickness	1.5mm
Frame surface	galvanised steel
Protection degree with closed panels	IP30
Protection degree with open panels	IP20
External colour	RAL 7035
Cable entry	from the base, from the roof or from the side

Main optional components

Additional RFI filters
Additional THD filters
12-pulse bridge
Battery control system:
Parallel configuration with active load distribution
Hot stand-by configuration
Special colours
Special protection degree
Output distribution panel

VEGA

10 - 20KVA 3Ph/1Ph
10 - 120KVA 3Ph / 3Ph

Main features:

- 6 pulse SCR rectifier
- IGBT inverter
- Power output transformer
- Low and stable ripple on battery for the highest battery conservation and life
- Pure output sinusoidal wave VFI-SS-III in accordance with the CEI EN 62040 standards
- Intelligent Fan Speed controller
- charge mode for AGM, flooded batteries, GEL , Ni-Cd and Lithum
- settable alarms thresholds
- Voltage recharge with temperature compensation for an highest battery life
- digital microprocessor controller, for the highest inverter reliability
- full opto isolation on all the logic and interface PCBs
- MODBUS® TCP Connectivity
- High short circuit current
- Isolation between input and output

Performances

The UPSs of the VEGA series assure the highest protection and power supply quality for any load, in particular for critical industrial uses, security systems, electro-medical systems, industrial processes and Telecommunication. VEGA is an on-line double conversion technology (VFI) uninterruptible power supply in accordance with VFI-SS-111 classification – as defined by standard IEC EN 62040-3 - with transformer in output to the inverter. The VEGA series made up by input threephase versions and single-phase output from 10 to 120kVA a threephase input and output versions from 10 to 60kVA. The VEGA series has 6 pulses thyristor rectifier with an optional filter for the reduction of the harmonics.

AUNILEC choices

AUNILEC has been developing and offering, since many years, different solutions to face needs and problems arising in the critical situations.
The UPSs produced by our partner have a simple maintenance. Natural ventilation chosen for the VEGA cabinets improve the reliability over time. VEGA is always working and continuously supplying power in high stress conditions also in the dusty industrial places.

Reliability

The rectifier and the inverter are separate units easily detectable and replaceable. Electronic control unit allows VEGA to work nonstop avoiding to leave the system stranded. Output transformer is a security insulation and improve the VEGA downstream selectivity of protections.
Magneto-thermal protection input protects effectively giving high short-circuit currents. Front panel access, possibility to tack VEGA to other switchboards, to support it to the wall enabling the improvement of installation and saving of space. Standard protection degree IP20 can become IP42 without big cost increases. Standard color RAL 7035 can be changed with low expenses according the customer needs.
Conversion unit has ventilation and to increase the reliability every fan are electronically controlled changing velocity according needs. Our staff is available to give information and advices on projects.

Incoming

VEGA includes a performing system for to be powered from generating sets.
The input is optimized thanks to the soft-start and constant monitoring of input factors.

Fields of application

VEGA is suitable for any kind of application, from computer industry to the most demanding industrial loads.
Thanks to the wide range of fittings and options, is possible to achieve most difficult configurations and articulated architectures.
Redundant, hot stand-by and parallel configurations are achievable to grant the maximum availability to the power supply.
VEGA includes:

- VFI double conversion, off-line UPS compatible with centralized systems supply applications (CSS)
- Frequency converter mode
- Soft Start to switch the UPS on also on lack of power supply
- Temperature sensor connection available for external battery cabinets, for the compensation of charging voltage.

Battery care

VEGA includes a rectifier flattening out filter to grant a very low (<1%) ripple charge.
VEGA cares about batteries as they are important. Battery is the emergency key and protect it is very essential. As option VEGA includes FALCON battery monitoring unit.
VEGA charging system consists of many functions and performances that allow to mange batteries to get the best performances and extend the operating life:

- Two voltage level charge to optimize the charging current and reduce the capacity restoration time
- Charging voltage compensation according to the temperature and deep discharge protections, to limit ageing process and extend the life of batteries.
- Charge blocking system to reduce the electrolyte consumption and further extend the battery life.

VEGA includes the possibility to manage different battery technologies: led acid, floded acid, VRLA AGM and Gel, NiCd. With a separate fitting it is possible to manage the lithium batteries.

Remote monitoring

VEGA can communicate in remote thanks to the standard communication interface MODBUS TCP. VEGA can be remotely monitored if equipped with EAGLE software.

Graphic Display

VEGA is equipped with graphic screen display giving information, sizes, alarms and status of UPS in different languages.
The default screen represents the UPS status showing the status of different pieces (rectifier, batteries, inverter, bypass)

Certifications

For the emergency lighting system applications VEGA is certified according the standard CEI/EN 50171 “Centralized power supply system” by Bureau Veritas.

Models	VT10/VM10	VT20/VM20	VT30	VT40	VT60
POWER (KVA)	**10**	**20**	**30**	**40**	**60**

INPUT

Rated Voltage	380 - 400 - 415 Vac 3Ph
Rated Voltage tolerance (%)	400 V + 20% /- 25%
Rated Frequency (Hz)	45 ÷ 65 Hz
Soft start	0 ÷ 100% in 30”
Frequency tolerance	± 2%
Standard equipment	Back Feed protection; separable bypass line; EPO

BATTERIES

Type	lead, flooded, VRLA AGM / GEL; NiCd -- Lithium
Ripple	< 1%
Temperature compensation	- 0.5 Vx°C
Typical charging current	0.1 x C10

OUTPUT

Rated output power (kVA)	10	20	30	40	60
Active power (kW)	8	16	24	32	48
Number of phases	3Ph + N				
Rated voltage	400 Vac 3Ph + N (in single-phase VM versions, the ouput voltage is 230Vac single-phase); it is possible to change output voltage between ± 10% via display				
Static stability	± 1%				
Dynamic stability	± 5% in 10 ms				
Voltage distortion	< 3% with linear load				
Crest factor (Ipeack/Irms)	3:1				
Frequency stability on battery	0.05%				
Frequency	50 o 60 Hz(it is possible to change it between ± 10% via display				
Overload	110% per 60’; 125% per 10’; 150% per 10”				

MECHANICAL DATA

Dimensions (LxPxH) (mm)	800X800 H=1800
Remote signals	voltage-free relay contacts
Communication	MODUS TCP + remote contacts + RS232 (proprietary protocol), MODBUS RTU VIA RS485 optional
Ambient temperature	0°C / +40°C
Relative umidity	< 95% without condensing
Colour	Gray RAL 7035
Acoustic noise level at 1m (from 0 to full load) (dBA)	< 60dB
Protection Degree	IP20
Efficiency in off-line (%)	till 98%
Standards	LV 2006/95/EC - 2004/108/EC; Safety requirements IEC EN 62040-1; EMC IEC EN 62040-2; Performances IEC EN 62040-3; CEI EN 50171
Standards according to IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111

Models	VT80	VT100	VT120
POWER (KVA)	**80**	**100**	**120**

INPUT

Rated Voltage	380 - 400 - 415 Vac 3Ph
Rated Voltage tolerance (%)	400 V + 20% /- 25%
Rated Frequency (Hz)	45 ÷ 65 Hz
Soft start	0 ÷ 100% in 30”
Frequency tolerance	± 2%
Standard equipment	Back Feed protection; separable bypass line; EPO

BATTERIES

Type	lead, flooded, VRLA AGM / GEL; NiCd -- Lithium
Ripple	< 1%
Temperature compensation	- 0.5 Vx°C
Typical charging current	0.1 x C10

OUTPUT

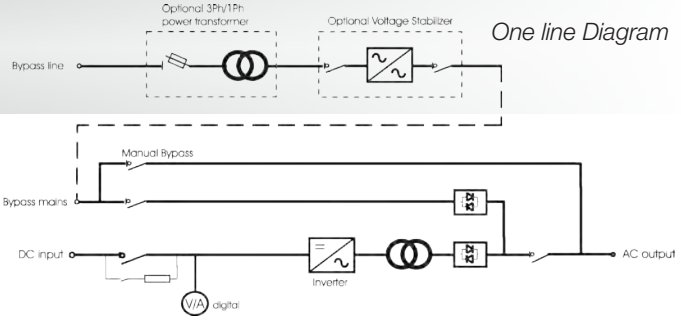
Rated power (kVA)	80	100	120
Active power (kW)	64	80	96
Number of phases	3Ph + N		
Rated voltage	400 Vac 3Ph + N (in single-phase VM versions, the ouput voltage is 230Vac single-phase); it is possible to change output voltage between ± 10% via display		
Static stability	± 1%		
Dynamic stability	± 5% in 10 ms		
Voltage distortion	< 3% with linear load		
Crest factor (Ipeack/Irms)	3:1		
Frequency stability on battery	0.05%		
Frequency	50 o 60 Hz(it is possible to change it between ± 10% via display		
Overload	110% per 60’; 125% per 10’; 150% per 10”		

MECHANICAL DATA

Dimensions (LxPxH) (mm)	1000X800 H=2100
Remote signals	voltage-free relay contacts
Communication	MODUS TCP + remote contacts + RS232 (proprietary protocol), MODBUS RTU VIA RS485 optional
Ambient temperature	0°C / +40°C
Relative umidity	< 95% without condensing
Colour	Gray RAL 7035
Acoustic noise level at 1m (from 0 to full load) (dBA)	< 60dB
Protection Degree	IP20
Efficiency in off-line (%)	till 98%
Standards	LV 2006/95/EC - 2004/108/EC; Safety requirements IEC EN 62040-1; EMC IEC EN 62040-2; Performances IEC EN 62040-3; CEI EN 50171
Standards according to IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111

Sinusoid wave PWM digital inverter 1Ph or 3Ph

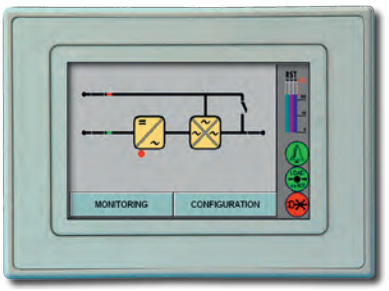
INV



One line Diagram

Main features:

- Clean and stable output AC with THD <2%.
- Redundant fan system with temperature and air flow control.
- By-pass static switch.
- Line Interactive mode efficiency >98%; on-line mode: >93%.
- Manual by-pass switch, allowing to perform maintenance operations without disconnecting the load.
- Possibility to supply a non-linear load with minimum distortion thanks to the high-frequency IGBT technology.
- Fuse protection on both the inverter and the emergency line, with burnt fuse identification and automatic insertion on the functional branch.
- Wide range of input voltages.
- Digital microprocessor control (DSP + PLD).
- Full optical isolation on all the logic and interface cards.
- Certified to operate in the harshest environment conditions.
- Overload capacity: 150% for 1 minute, 110% for 2 hours.
- Shortcircuit-proof architecture.
- Modbus communication interface through RS232 or RS485 port.
- Ethernet connectivity.



The AUNILEC INV series offers a range of one- and three-phase inverters with IGBT power conversion bridge.
The system has been designed to continuously supply extra-low harmonics AC current to critical loads. The integrated static switch can automatically perform quick switching operations on the DC line, in case of black-out only, to substantially increase the global efficiency; it can also perform an ON-LINE conversion, in which the wave form is always generated by the inverter, thus ensuring a stable, undistorted waveform.
In this case the load is switched to the emergency line only in case of inverter failure.
The fast control system and the high-frequency PWM technology allow to connect the inverter to non-linear loads with a very low waveform distortion.
The graphical display allows to show an easy to understand one-line diagram displaying the current status of the inverter and of the static switch, thus providing an accurate overview of the alarms and measurements.

Parallel and hot stand-by systems

To ensure the power supply continuity, AUNILEC adopts two solutions: HOT STAND-BY and N+1 redundancy.
The hot stand-by mode uses two identical inverters and powers the load with one of them, while the other is active and synchronised with the mains, ready to intervene in no time should the first machine fail.
The N+1 redundancy solution uses multiple inverters connected in parallel, always on and running, dividing the current load among them; the whole system is designed to ensure load powering even in case of inverter failure.
Should the failure involve more than one inverter, the load is switched anyway to the emergency line without any power supply interruption.

Model	Input voltage	Output voltage	Power
INV M 005/11	110Vdc (opt.125Vdc)	230Vac / 115Vac 1PH	5kVA
INV M 010/11			10kVA
INV M 015/11			15kVA
INV M 020/11			20kVA
INV M 030/11			30kVA
INV M 040/11			40kVA
INV M 050/11			50kVA
INV T 010/11	110Vdc (opt.125Vdc)	400Vac / 190Vac 3PH	10kVA
INV T 015/11			15kVA
INV T 020/11			20kVA
INV T 030/11			30kVA
INV T 040/11			40kVA
INV T 050/11			50kVA
INV M 005/22	220Vdc	230Vac / 115Vac 1PH	5kVA
INV M 010/22			10kVA
INV M 015/22			15kVA
INV M 020/22			20kVA
INV M 030/22			30kVA
INV M 040/22			40kVA
INV M 050/22			50kVA
INV M 060/22			60kVA
INV M 080/22			80kVA
INV M 100/22			100kVA
INV T 010/22	220Vdc	400Vac / 190Vac 3PH	10kVA
INV T 015/22			15kVA
INV T 020/22			20kVA
INV T 030/22			30kVA
INV T 040/22			40kVA
INV T 050/22			50kVA
INV T 060/22			60kVA
INV T 080/22			80kVA
INV T 100/22			100kVA

OTHER TECHNICAL CHARACTERISTICS

Output distortion	<2% (VFI-SS-III class according to IEC/CEI EN 62040)
Dynamic stability	-8%/+13% restore to ±1% in 80ms
switching	<1ms

COMMUNICATIONS

Contacts in terminal box	Voltage-free contacts
Remote controls	ON/OFF switch, Man. charge, Probe temp.
Communication	Modbus protocol via RS485 DB9 serial port; TCP/IP

ENVIRONMENT

Cooling	Forced
Temperature	-5/+40°C, 93% humidity (without condensation)
Noise level	50 to 60dB (depending on sizes)

MECHANICAL

Metal frame thickness	2.5mm
Metal door thickness	1.5mm
Frame	Galvanised steel
Protection degree with closed door	IP30
Protection degree with open door	IP20
Colour	RAL 7035
Cable entry	From below, from above, from the side

Main optional components

Parallel configuration with active load distribution
Hot stand-by configuration
Special colours
Special protection degree
Output distribution panel

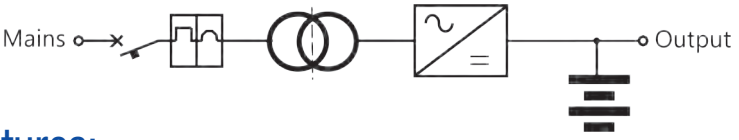
100 KVA inverter installed in the solar power station of Hassi R'Mel

Rectifiers
Battery Chargers

Aunilec®

Digital rectifiers with forced cooling AC/DC Scr bridge

RDC

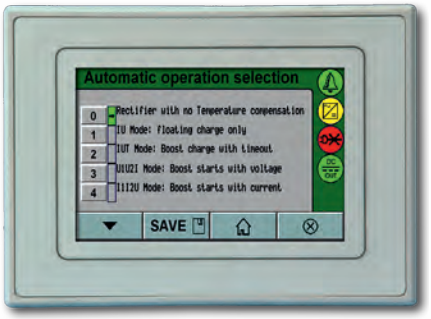


Main features:

- Clean and stable output DC current with ripple voltage peak-peak value <1%
- Redundant fan system with temperature and air flow control.
- 5 automatic charging modes.
- Manual charging mode.
- 4 adjustable voltage levels (the rectifier can operate as a power supply at the rated voltage or as a battery charger.
- Adjustable times and alarm thresholds.
- Temperature compensation programmable on the charging voltage to prolong the battery life.
- Digital microprocessor control (DSP + PLD).
- Full optical isolation on all the logic and interface cards.
- Low input harmonic distortion with the twelve-phase bridge and the optional input filter.
- Certified to withstand the harshest environment conditions.
- Efficiency exceeding 90% (low-frequency transformer included).
- Modbus communication interface through RS232 or RS485 port.
- Ethernet connectivity.
- Optional FALCON battery control system.
- “H class” input isolation transformer.

Power supply systems for industrial environments:

RDC, the battery charging rectifier, is an energy converter for industrial use designed to ensure a constant power supply in association with the batteries. Using different types of connections and operating criteria, and building on the experience gained in the last 40 years, our partner can fulfil any request while ensuring a high system efficiency.
The series of rectifiers and battery chargers for industrial use is based on total control 6- or 12-pulse thyristor bridges. We can supply a wide range of systems with voltage output from 24 V DC to 220 V DC and current output up to 1000 A. The equipment is installed inside stand-alone, self-supporting cabinets. The frame and the panels are made of steel. The protection degree is IP 30 (up to IP42 upon request) and IP 20 when the panels are open; access to the equipment is from the front.
The equipment is designed, manufactured and tested in compliance with the applicable IEC regulations.



The graphical display allows to choose between 4 different charging modes:
- Rectifier only
- Equalised charging with temperature compensation
- Quick charging activation
- Manual and battery forming charging

The voltage curves are compliant with the DIN 41773 standard, for an optimum charge allowing to extend the battery life.

Parallel solution to increase efficiency and yield

AUNILEC has designed a wide range of parallel solutions to increase the general system MTBF until making it virtually infinite. Thanks to a CAN BUS communication card, in fact, the different rectifiers divide the load into equal shares, and manage a complex function exchange system.

Redundant single-branch rectifier with redundant DC/DC converters

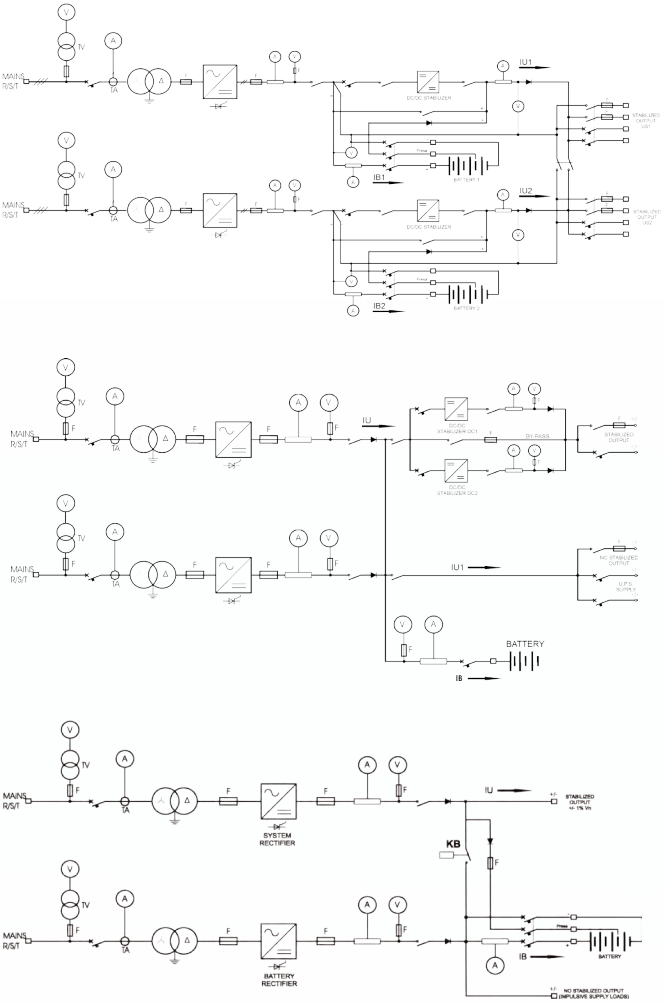
The single-branch redundancy allows to keep the load and the battery powered by two parallel digital rectifiers, that by dividing the currents reduce the strain of each rectifier. The load, requiring a voltage level lower than that of the batteries, is powered through a redundant DC/DC converter.
In case of failure, the other rectifier will take on the whole load.

Double-branch rectifier with AUNILEC "EES" (Emergency Exchange System)

The equipment includes two AC/DC conversion units, that when power is supplied by the mains operate independently. During normal operation, when power is supplied by the mains, the two converters run independently. The rectifier will charge the battery, while the system branch supplies the load with a stabilised voltage with a tolerance of ± 1%.
A total mains blackout or the failure of both rectifiers will automatically trigger a sequence that supplies the direct load connection to the battery.
In case of failure of one of the two branches, the other automatically starts supplying power to the load while charging the battery at a voltage equal to 110% of the rated voltage (adjustable value).

Once the mains power supply is restored, the system will automatically resume operation, and each converter will return to its normal operation mode.

Sample customised solution based on technical specifications.



Model	Output voltage	Output current
RDC 24/100	24 Vdc	100 A
RDC 24/120		120 A
RDC 24/150		150 A
RDC 24/200		200 A
RDC 24/250		250 A
RDC 24/300		300 A
RDC 24/400		400 A
RDC 24/500		500 A
RDC 24/600		600 A
RDC 24/800		800 A
RDC 24/1000		1000 A
RDC 48/60	48 Vdc	60 A
RDC 48/80		80 A
RDC 48/100		100 A
RDC 48/120		120 A
RDC 48/150		150 A
RDC 48/200		200 A
RDC 48/250		250 A
RDC 48/300		300 A
RDC 48/400		400 A
RDC 48/500		500 A
RDC 48/600		600 A
RDC 48/800		800 A
RDC 48/1000		1000 A

Model	Output voltage	Output current
RDC 110/60	110Vdc (Opt.125Vdc)	60 A
RDC 110/80		80 A
RDC 110/100		100 A
RDC 110/120		120 A
RDC 110/150		150 A
RDC 110/200		200 A
RDC 110/250		250 A
RDC 110/300		300 A
RDC 110/400		400 A
RDC 110/500		500 A
RDC 110/600		600 A
RDC 110/800		800 A
RDC 110/1000		1000 A
RDC 220/25	220 Vdc	25 A
RDC 220/40		40 A
RDC 220/60		60 A
RDC 220/80		80 A
RDC 220/100		100 A
RDC 220/120		120 A
RDC 220/150		150 A
RDC 220/200		200 A
RDC 220/250		250 A
RDC 220/300		300 A
RDC 220/400		400 A
RDC 220/500		500 A
RDC 220/600		600 A
RDC 220/800		800 A
RDC 220/1000		1000 A

OTHER TECHNICAL CHARACTERISTICS

Input frequency	50/60 Hz
Frequency range	±10%
Input voltage	400 Vac 3PH
Input voltage range	±10%
Input THD	27% with 6P, 12% with 12P, 6% with 12P + THD filter
Output voltage	4 levels (power supply only, charge level 1,2,3)
“Soft” start	yes, 0->100% in 10 sec
Dynamic stability	±10%, 1% in 200ms
Temperature compensation	0/-0.3V/°C
Ripple	< 1%

COMMUNICATIONS

Remote signalling	Voltage-free relays
Communication	Modbus protocol through RS485 DB9 serial port; TCP/IP

ENVIRONMENT

Cabinet Cooling	Natural
Operating conditions	-5/+40°C, 93% Humidity (without condensation)
Noise	53 to 58 dB depending on size

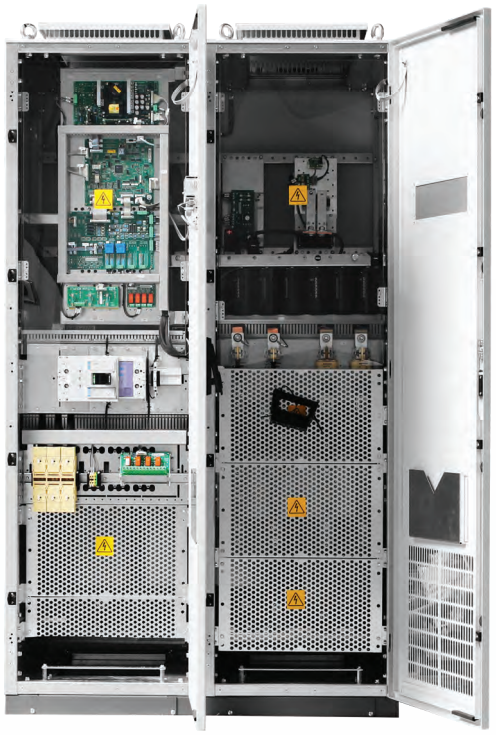
MECHANICS

Metal frame thickness	2.5mm
Metal door thickness	1.5mm
Frame surface	galvanised steel
Protection degree with closed panels	IP30
Protection degree with open panels	IP20
External colour	RAL 7035
Cable entry	from the base, from the roof or from the side

Main optional components

Additional RFI filters
Additional THD filters
12-pulse bridge
Battery monitoring unit
DC/DC stabiliser
Parallel active load distribution
Special colours
Special protection degree
Output distribution panel

SME



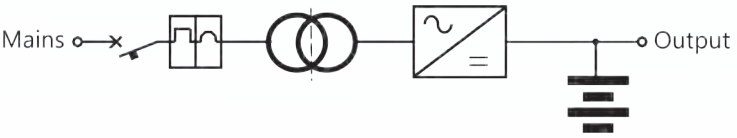
The SME range consists of single-branch battery charging rectifiers with AC/DC conversion units featuring a total control six-phase technology. Natural cooling touch screen display.
The SCRs are controlled digitally, all adjustments are performed through. The systems are equipped with digital HMI on the front panel, showing operation: features status notification and with alarm contacts in the terminal box. The SME series rectifiers can recharge all VRLA, GEL, NiCd and open cup batteries.

Product pluses

- TOTAL CONTROL SCR bridge in natural cooling
- L/C filter for the reduction of the residual alternate current at output and in batteries
- DIGITAL touch screen HMI
- Input isolation transformer
- High reliability
- Designed to ensure high performances and reliability
- Suitable to recharge all battery types (sealed Pb, open cup Pb, Ni/Cd, GEL)

Applications

- Power Stations and Substations
- Oil & Gas and Petrochemical Plants
- Water Treatment Plants
- Manufacturing Plants
- Transportation



Model	Output voltage
SME 24/60	24 Vdc
SME 24/80	
SME 24/100	
SME 24/120	
SME 24/150	
SME 24/200	
SME 24/250	
SME 24/300	
SME 24/400	
SME 24/500	
SME 48/60	48 Vdc
SME 48/80	
SME 48/100	
SME 48/120	
SME 48/150	
SME 48/200	
SME 48/250	
SME 48/300	
SME 48/400	
SME 48/500	

Model	Output voltage
SME 110/60	110 Vdc
SME 110/80	
SME 110/100	
SME 110/120	
SME 110/150	
SME 110/200	
SME 110/250	
SME 110/300	
SME 110/400	
SME 110/500	
SME 220/60	220 Vdc
SME 220/80	
SME 220/100	
SME 220/120	
SME 220/150	
SME 220/200	
SME 220/250	
SME 220/300	
SME 220/400	
SME 220/500	

OTHER TECHNICAL CHARACTERISTICS

Input frequency	50/60 Hz
Frequency range	±10%
Input voltage	400 Vac 3PH
Input voltage range	±10%
Input THD	27% with 6P, 12% with 12P, 6% with 12P + THD filter
Output voltage	4 levels (power supply only, charge level 1,2,3)
“Soft” start	yes, 0->100% in 10 sec
Dynamic stability	±10%, 1% in 200ms
Temperature compensation	0/-0.3V/°C
Ripple	< 1%

COMMUNICATIONS

Remote signalling	Voltage-free relays
Communication	Modbus protocol through RS485 DB9 serial port; TCP/IP

ENVIRONMENT

Cabinet Cooling	Natural
Operating conditions	-5/+40°C, 93% Humidity (without condensation)
Noise	53 to 58 dB depending on size

MECHANICS

Metal frame thickness	2.5mm
Metal door thickness	1.5mm
Frame surface	galvanised steel
Protection degree with closed panels	IP30
Protection degree with open panels	IP20
External colour	RAL 7035
Cable entry	from the base, from the roof or from the side

Main optional components

Additional RFI filters
Additional THD filters
12-pulse bridge
Battery monitoring unit
DC/DC stabiliser
Parallel active load distribution
Special colours
Special protection degree
Output distribution panel

AME

The AME range consists of single-branch battery charging rectifiers with modular conversion units featuring a total control six-phase technology. The SCRs are controlled analogically, all adjustments are performed through a trimmer. The systems are equipped with digital instruments on the front panel, with LEDs for operating status notification and with alarm contacts in the terminal box. The SME series rectifiers can recharge all VRLA, GEL, NiCd and open cup batteries.

Product pluses

- TOTAL CONTROL SCR bridge in a removable modular solution
- L/C filter for the reduction of the residual alternate current at output and in batteries
- Optical indications and alarm contacts
- DIGITAL instruments, 0.5 class
- Input isolation transformer, complete with screen
- High reliability
- User-friendliness
- Designed to ensure continuous service
- Suitable to recharge all battery types (sealed Pb, open cup Pb, Ni/Cd, GEL)

Applications

- Power Stations and Substations
- Oil & Gas and Petrochemical Plants
- Water Treatment Plants
- Manufacturing Plants
- Transportation

Alarm contacts

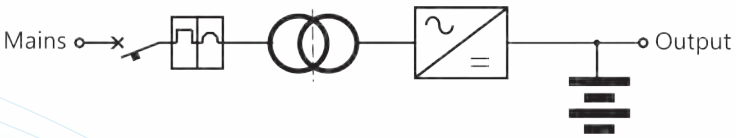
- Mains failure
- Minimum battery voltage
- Fault
- Ground pole (optional)

Protections

- Automatic main switch
- Battery fuses

Optical indications

- Mains OK
- Phase sequence
- In service
- Supply fault
- High DC voltage
- Bridge fuses
- Overtemperature
- Maximum charge duration
- level 1 (back-up charge)
- Constant voltage
- Min. battery voltage
- Discharging battery
- +/- ground pole (optional)
- LED test button



Input

Input voltage Three-phase	400Vca
Input voltage tolerance	±10%
Rated frequency	50÷60Hz
Tolerance on frequency	± 5%

Output

Output voltage stability	± 1%
Output voltage	1.13 Vn at charge end / 0.90 Vn at discharge end
Ripple	< 1%
Operation	Fully automatic, IU charging characteristic

GENERAL INFORMATION

Environment temperature	0-40°C
Maximum relative humidity	< 90% without condensation
Maximum altitude	1000m at An rated power
Cooling	NATURAL VENTILATION
Acoustic noise (measured 1 m from the front)	<55dB
Protection degree	IP30; IP20 with open door
Cable access	FROM BELOW

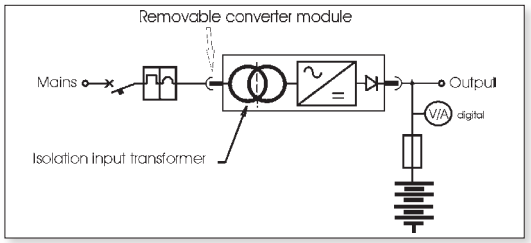
Model	INPUT	DC Vdc	OUTPUT A	Dimensions (WxDxH) mm
AME 24/60	3x400	24	60	600X600X1600
AME 24/80	3x400	24	80	600x600x1600
AME 24/100	3x400	24	100	600x600x1600
AME 24/120	3x400	24	120	600x600x1600
AME 24/150	3x400	24	150	600x600x1600
AME 48/60	3x400	48	60	600x600x1600
AME 48/80	3x400	48	80	600x600x1600
AME 48/100	3x400	48	100	600x600x1600
AME 48/120	3x400	48	120	600x600x1600
AME 48/150	3x400	48	150	600x600x1600
AME 110/60	3x400	110	60	600x600x1600
AME 110/80	3x400	110	80	600x600x1600
AME 110/100	3x400	110	100	600x600x1600
AME 110/120	3x400	110	120	600x600x1600
AME 110/150	3x400	110	150	600x600x1600
AME 220/60	3x400	220	60	600x600x1600
AME 220/80	3x400	220	80	600x600x1600
AME 220/100	3x400	220	100	600x600x1600
AME 220/120	3x400	220	120	600x600x1600
AME 220/150	3x400	220	150	600x600x1600

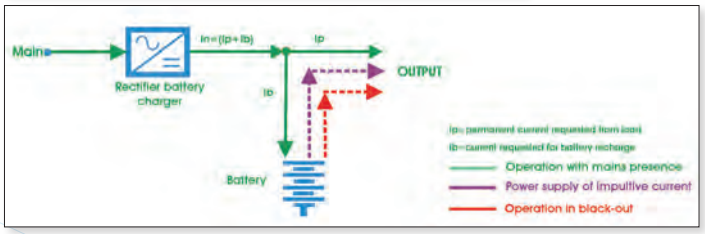
AMS

The AMS series rectifiers are static conversion devices with direct current output, complete with sealed back-up batteries.
The single-branch configuration proposed here, with the rectifier connected in parallel to the accumulator batteries and to the load, ensures that the system is particularly suited for the supply of power to loads with strong pulse currents, assuring service continuity even in case of black-out with nil tripping time.
The AMS range uses the CH series modular conversion units.

Product pluses

- Digital instruments, 0.5 class
- L/C filter for the reduction of the residual alternate current at output and in batteries (ripple <1%)
- Signalling LEDs
- Exchange and voltage-free alarm contacts
- Input isolation transformer with screen
- CH series removable modular conversion unit
- Natural ventilation
- Modular conversion units
- Low MTTR due to the modularity of the conversion units
- High MTBF
- Easy maintenance





Optical indications

- Mains OK
- DC output
- Min. battery voltage
- Fault

Alarm contacts

- Mains failure
- Minimum battery voltage
- Fault

Protections

- Main switch automatic modular
- Battery fuses

Input

Input voltage tolerance	±10%
Rated frequency	50÷60Hz
Tolerance on frequency	± 5%

Output

Output voltage stability	± 1%
Output voltage	1.13 Vn at charge end / 0.90 Vn at discharge end
Ripple	< 1%
Operation	Fully automatic, IU charging characteristic

Overload

The overload is only in case of battery connected	**110% for 1 hour** **200% for 1 minute** **300% for 30 seconds**

GENERAL INFORMATION

Environment temperature	0-40°C
Maximum relative humidity	< 90% without condensation
Maximum altitude	1000m at An rated power
Cooling	NATURAL VENTILATION
Acoustic noise (measured 1 m from the front)	<55dB
Protection degree	IP30; IP20 with open door
Cable access	FROM BELOW

Model	Input voltage	V OUT rated	V OUT real with mains	Rated Power	Power for 30sec.	AUT.		WEIGHT	Maximum input current
	Vca	Vcc	Vcc	W	W	HOURS	Ah	Kg	A
AMS 24/25/B40/A	230	24	27,5	600	1.800	1	40	109	5,0
AMS 24/25/B65/A	230	24	27,5	600	1.800	2	65	127	5,0
AMS 24/25/B100/A	230	24	27,5	600	1.800	3	100	148	5,0
AMS 24/40/B40/A	230	24	27,5	960	2.880	0,5	40	175	7,3
AMS 24/40/B65/A	230	24	27,5	960	2.880	1	65	183	7,3
AMS 24/40/B120/A	230	24	27,5	960	2.880	2	120	195	7,3
AMS 24/60/B65/A	230	24	27,5	1.440	4.320	0,5	65	187	12,0
AMS 24/60/B100/A	230	24	27,5	1.440	4.320	1	100	188	12,0
AMS 24/60/B200/A	230	24	27,5	1.440	4.320	2	200	254	12,0
AMS 48/10/B18/A	230	48	54	480	1.440	1	18	11	4,2
AMS 48/10/B24/A	230	48	54	480	1.440	2	24	120	4,2
AMS 48/10/B40/A	230	48	54	480	1.440	3	40	140	4,2
AMS 48/10/B65/A	230	48	54	480	1.440	4	65	210	4,2
AMS 48/30/B40/A	230	48	54	1.440	4.320	1	40	176	13,2
AMS 48/30/B65/A	230	48	54	1.440	4.320	1,5	65	210	13,2
AMS 48/30/B100/A	230	48	54	1.440	4.320	2	100	254	13,2
AMS 48/30/B120/A	230	48	54	1.440	4.320	3	120	302	13,2
AMS 110/5/B7/A	230	110	121	550	1.650	1	7	106	4,5
AMS 110/5/B18/A	230	110	121	550	1.650	3	18	138	4,5
AMS 110/5/B24/A	230	110	121	550	1.650	4	24	160	4,5
AMS 110/5/B40/A	230	110	121	550	1.650	8	40	238	4,5
AMS 110/15/B18/A	230	110	121	1.650	4.950	1	18	170	12,0
AMS 110/15/B40/A	230	110	121	1.650	4.950	1,5	40	244	12,0
AMS 110/15/B65/A	230	110	121	1.650	4.950	3	65	325	12,0
AMS 110/15/B100/A	230	110	121	1.650	4.950	5	100	419	12,0
AMS 110/30T/B40/A	400	110	121	3.300	9.900	1	40	265	6,5
AMS 110/30T/B65/A	400	110	121	3.300	9.900	1,5	65	300	6,5
AMS 110/30T/B100/A	400	110	121	3.300	9.900	3	100	440	6,5

Wide rang of Double-branch rectifiers

The double-branch rectifiers are static conversion devices with DC output, allowing to charge a battery of static accumulators and in the meantime to supply power to a permanent load. The equipment includes TWO CONVERSION UNITS, one charging the battery (battery branch, RB) and one supplying power to the system (service/system branch, RS). The service branch is of stabilised type. The battery charging branch can be supplied, upon request, with up to three charge levels (maintenance, quick and manual) according to the type of accumulators in use and with a device adjusting the charging voltage according to the battery temperature.

Product pluses

- Isolation transformer with screen both at the battery branch input and at the system branch input
- Removable modular conversion unit
- L/C filter for the reduction of the residual alternate current at output and in batteries
- Optical indications and alarm contacts
- 0.5 class DIGITAL instruments at output and in the battery
- High reliability
- Designed to ensure continuous service
- Suitable to recharge all battery types (sealed Pb, open cup Pb, Ni/Cd, GEL)

Applications

- Power Stations and Substations
- Oil & Gas and Petrochemical Plants
- Water Treatment Plants
- Manufacturing Plants
- Transportation

Alarm contacts

- Mains failure
- Minimum battery voltage
- Fault
- Ground pole (optional)

Optical indications

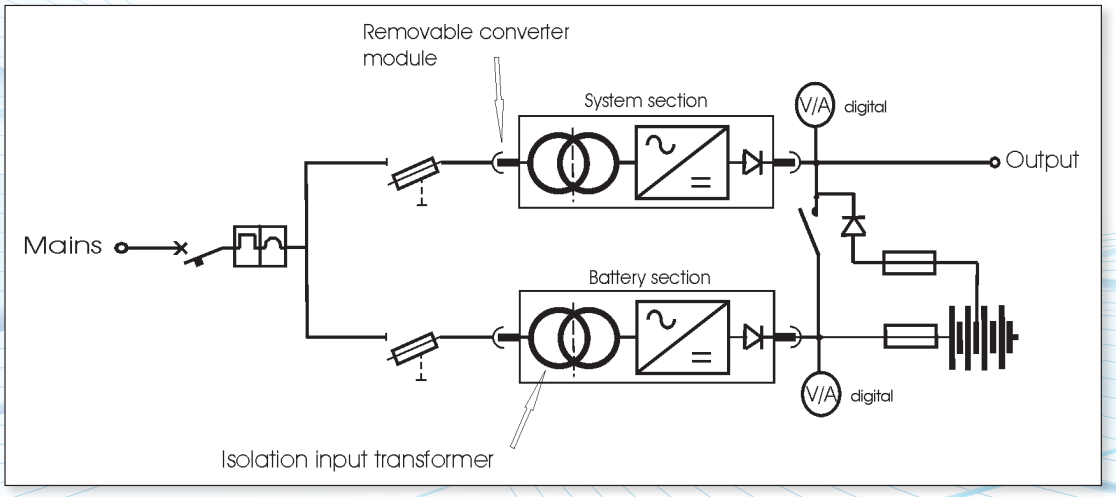
Battery branch
- Mains OK
- In service
- Min. battery voltage
- Fault
- Discharging battery

System branch
- Mains OK
- In service
- Low DC voltage
- Fault
- +/- ground pole

(optional) LED test button

Protections

- Automatic main switch
- Battery fuses
- Branch input fuses



Emergency Exchange System

(Function exchange between the two branches)

“EES” system
Maximum operating reliability

Our EES system has been designed to resolve the problem of load power supply interruption in case of service/battery branch failure. The EES system combines the reliability of the single-branch configuration with the uncoupling of the battery charge voltage from the load supply voltage - a feature typical of the double branch solution.

Operating principle:

The double-branch rectifiers are equipped with two conversion units that when power is supplied by the mains operate independently, ensuring that the battery branch converter (RB) charges the battery independently of the load, meeting the DIN charging curves; in the mean time the service branch (RS) will supply power to the load at a stabilised voltage with a tolerance of ± 1%, independently of the battery charging voltage.

Normal operation

During normal operation, when power is supplied by the mains, the two converters (RS and RB) are independent.
The RB rectifier will charge the battery and the RS rectifier will directly supply power to the services at a stabilised voltage with a tolerance of ± 1%.

Operation in case of black-out

The total absence of the mains voltage or the failure of both rectifiers will automatically trigger a sequence that automatically connect the load directly to the battery.

RS (service) branch failure

Any failure of the service branch will trigger an automatic exchange sequence, following which the battery branch will supply power to the services and in the means time will charge the battery, with an emergency voltage threshold of Vn + 10% (adjustable).

RB (battery) branch failure

Any failure of the battery branch will trigger an automatic exchange sequence, following which the service branch will supply power to the services and in the means time will charge the battery, with an emergency voltage threshold of Vn + 10% (adjustable).

Once the failure is repaired the system will automatically resume operation, entrusting each converter with its task.

The function exchange system doesn’t inherently represent a redundancy between the service branch and the battery branch; that is only achieved when the branches have the same power.

Batteries · Battery monitoring units

Aunilec®

FALCON series

The reliability and service continuity of the power supply system are getting more and more critical for our daily life.
Any market and industry sector is governed and controlled by system whose service continuity is essential. In case of emergency, the back-up power is generally supplied by a battery of lead accumulators, and constant maintenance and control ensure that the system will always be efficient and reliable. Aunilec, always striving to meet the actual needs and requirements of its customers offers a new and innovative monitoring system for lead electric accumulators.
Building on its experience and its high technological know-how, our partner has manufactured a versatile equipment allowing to monitor the main functional parameters of a battery, providing valuable support for preventive maintenance operations and for the immediate identification on any faillures.
This system allows a new approach to battery monitoring and control: it can be compared to a technician who on a daily basis checks the accumulators, pointing out any faults, thus drastically reducing the maintenance voltage reading time. With the new monitoring system, our partner has developed a truly innovative product, reliable and featuring an interesting price/performance ratio.

Product pluses

- It checks the operating parameters
- It points out and signals any faults
- It is an effective preventive maintenance system
- It helps ensuring that the battery is always in good working order
- It reduces/eliminates the need for the normal maintenance processes
- It helps reducing the costs associated with battery maintenance and management

It ensures trouble-free service

Optional accessories

- Hall-effect sensor for 50A current detection, available in various sizes up to 1500A
- PT 100 temperature probes
- Isolated interface for data transmission with RS 232 /422/485

Alarms

They can be programmed by the user and provide a visual indication through the display; they can be linked to external devices through a dry electrical contact. In particular they detect: battery failure, component short-circuit, minimum voltage, maximum voltage, maximum environment temperature, maximum battery temperature.

Technical specifications

- Power supply: from mains or battery, with three voltage ranges between 24 and 480 Volt (d.c. or a.c.)
- Input power when in stand-by: 2.2 Watt (max 4 Watt with alarms on)
- Operating temperature: -20 +50°C
- Number of channels for battery voltage detection: twelve
- Detection voltages for each channel: 2 to 40 Volt d.c.
- Temperature detection range: -40 to +80°C
- Interfacing devices: general alarm dry contact

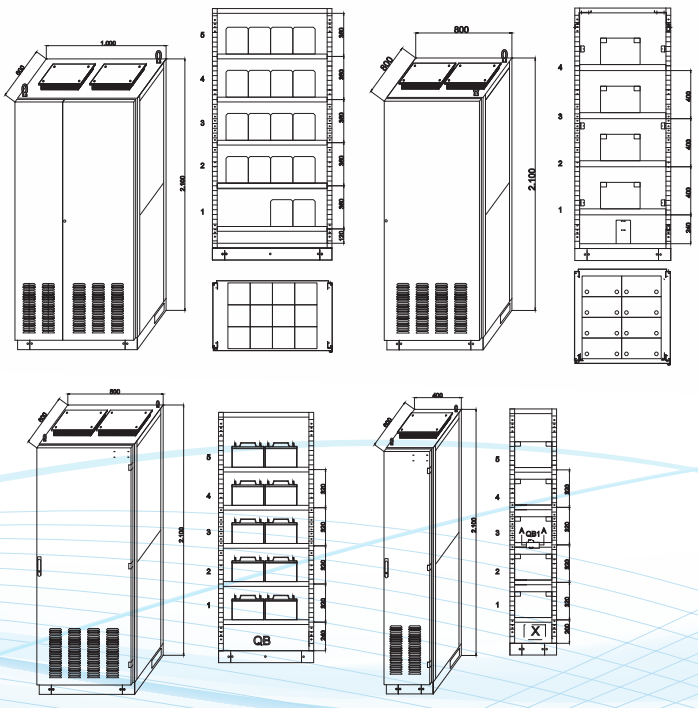
Viewable data

- Total battery voltage
- Voltage of each channel
- Charging and discharging current (if equipped with current probe)
- Deviation of each channel voltage from the average battery voltage
- Alarms, if any
- Date and time
- Environment temperature (if equipped with probe)
- Battery temperature (if equipped with probe)

BATTERIES

Forty years of experience in battery recharging

Since its foundation, batteries have been AUNILEC's core business.
As a manufacturer of battery chargers, AUNILEC has a deep knowledge of the batteries and of their installation, and has excellent relations with the main battery manufacturers.
We also manufacture various types of cabinets, allowing to stock even 1000Ah into a single, strong chassis.



AUNILEC has a facility specially designed for metal carpentry, in which it can produce cabinets of any size according to customer requests.

Thanks to its knowledge of the battery production world, AUNILEC can meet even the most detailed requirements. As an alternative, the AUNILEC experts may help you to find the battery solution that best meets your requests.
Knowing how important battery reliability is in case of emergency, in fact, we may help its customers to make the right choice, providing advice on such issues as:

- Proper battery sizing
The total cost of the batteries and of their maintenance may be far from negligible. For this reason we insist on the point that battery capacity must be planned according to the needs.

- Appropriate expected battery life
For mission-critical applications, we recommend that you use batteries ensuring at least 12 years of operation. Replacement, in fact, is often a heavy charge, due to transport and installation costs.

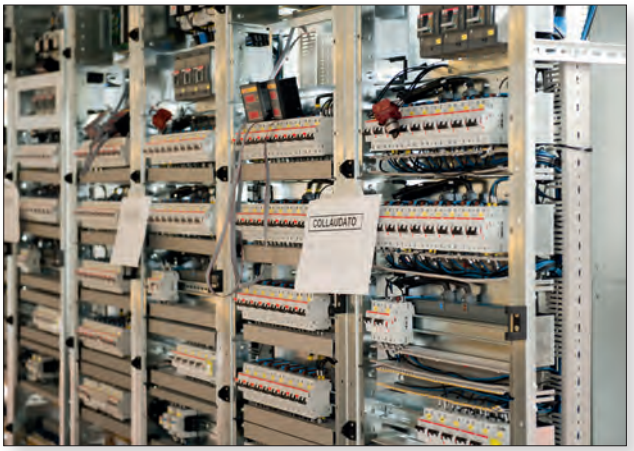
- Battery type
We propose different type of batteries depending on the installation site and on the customer requests, to ensure maximum reliability. The main technologies in use are: Open cup lead-acid batteries, VRLA sealed batteries and nickel-cadmium batteries.

-Simple replacement and maintenance
We can supply batteries featuring different shapes and structure, to better suit the different applications.

LMS

Since 1985 our partner has been successfully manufacturing distributions boards supplied in conjunction with rectifiers and UPS units. Strong specialisation in direct current and in its distribution has allowed to become a reference point in its industry.

Our partner's recipe ingredients to customers satisfaction are:
- High skilled Technicians and Qualified Personnel
- Specific Technical Instruments
- Modern CAD and IT Systems for best design
- Fully compliance with current regulations and standards
- Complete Power Solutions Development from concept to design, from Manufactoring to Test and Installation



COMPLYING WITH THE FOLLOWING STANDARDS:
CEI EN 61439
UNI EN 9001

Technical office

Using products belonging to the most prestigious brands available on the markets, our technical office designs and draws up the electrical equipment diagrams; it also supervises the manufacturing and the execution of the conformity tests according to the CEI EN 61439 standard.
Thanks to numeric control equipment and to advanced electric design software, we can manufacture special products according to the specifications provided by the customer, without increasing the end cost for the customer. Thank to continuous stocking, Aunilec can meet more quickly the requests of the most demanding customers.

Mechanical workshop

The mechanical workshop takes care of performing the assembly operations, of preparing the mechanical component carpentry and of supplying the copper bars for the electrical power connections, using state-of-the-art equipment. Thanks to a comprehensive range of sheet machining equipment we are able to provide our Customers with first-class services.

Electrical workshop

Following the indications provided by the technical office, the electrical workshop takes care of the wiring and of the functional and instrumental testing of the electrical equipment.

Installation and commissioning

The commissioning procedure ensures safe operation from the start.

If you have chosen a Aunilec system solution, we are going to support you throughout the whole process, since the reception of your order. Our services cover design, production, final testing, delivery, installation and timely, accurate commissioning.
Commissioning is an essential step of installation.
It assures compliance with the warranty conditions and an operating procedure that is optimised according to AUNILEC specification.
This prolongs the system life and allows to fully exploit its potentialities.

Critical issues

- The electric installation must be completed before commissioning
- This type of service may take about 4 weeks
- The technician's intervention will have to be planned in agreement with AUNILEC
- Installation is not included in the service

Information

- Any defect in system installation due to incorrect installation by unauthorised personnel will invalidate the AUNILEC warranty.

Services included in the AUNILEC commissioning program

Assurance of appropriate installation, parameter setting and system operation in compliance with AUNILEC specifications

- Visual testing of the system area
- Visual testing of the system and batteries to identify any malfunctions and damages
- Compliance with the installation conditions
- System and battery compartment ventilation
- Compliance with the AUNILEC base conditions, in line with the AUNILEC specifications

Installation control

- Inspection of the whole equipment and harness checking.
- Inspection of the battery connections
- Compliance with local safety standards and regulations.
- Sizing of the protective equipment.
- Check of the neutral line and of the star centre

Measurements and tests

- Power supply and connection check
- Careful diagnosis and self-testing, in addition to the switching sequence check

Communication interfaces

- Panel and communication connection check
- Installation of the remote service (optional)

Battery test

- Check of the battery capacity and of the compliance with the battery disposal regulations.
- Check of the technical characteristics, discharge test

Training

- Training of the technical staff as to system operation
- Knowledge transfer concerning the system circuit management or the management in case of black-out

Benefits of the AUNILEC commissioning for the customer

- Safety, AUNILEC warranty continuity and extension
- Implementation by AUNILEC with qualified and specialised manufacturer personnel
- Coordination and clear allocation of responsibilities by AUNILEC to ensure a regular implementation
- Full system inspection, testing and parameter setting, to ensure optimum efficiency and duration
- Documentation of all the components, of the settings and of the on-site environment conditions in a single detailed report
- Central storage of the data system and of the history, allowing to more promptly meet the requests for adaptations, conversions, support or failure analysis
- Start of the warranty period from the commissioning date and not from the date of delivery

Replacing the batteries

Battery replacement affects safety, and is a critical investment for system protection

The battery is the main system component. The battery must only be replaced by the manufacturer. Thanks to the AUNILEC battery replacement program, you'll be sure that the batteries in use have been tested and are compatible with your system.

Our partner offers long-lasting and reliable batteries at the best price. With a large number of installed system and thanks to well-established collaborations with battery manufacturers, we can build on our 40-year technical and industrial experience to ensure your safety.

Critical issues

- Only genuine batteries authorised by AUNILEC can be installed in your system!

Benefits of the AUNILEC batteries replacement program for the customer

- Safety, AUNILEC warranty continuity and extension
- Trouble-free installation, as we only use genuine batteries and spare parts
- Genuine batteries authorised by AUNILEC, featuring a 12-month warranty
- Batteries whose characteristics, behaviour and functions have been specially designed for the installation of your AUNILEC system
- Coordination of the delivery, unpacking, installation, return and disposal stages by AUNILEC
- Efficient installation by a AUNILEC qualified engineer team
- Comprehensive report to the customer concerning the tasks carried out on-site
- Full environment-friendly management of the whole battery life, including disposal
- Optimised and customised battery replacement time calculation, taking into account economical and business issues since your request (cost saving potential)

Services offered by the battery replacement program

Replacement

Our battery replacement program includes the on-site replacement of your batteries and their recommissioning. This service assures the compliance of your system with the relevant technical and environmental specifications.

Organisation and consultancy

Through an in-depth analysis during a meeting at the installation site we'll implement a cost-effective project for your batteries, taking into account your requests. This includes the battery diagnosis and inspection. Place your trust in the expert advice of a team of engineers building on 40 years of experience in the field of batteries and related equipment. The AUNILEC experts are from the local area and receive more than 50 hours of training every year.

Quality batteries

AUNILEC only uses system-specific batteries, in compliance with the provisions of the ISO 14001 standard, with a 12-month warranty. We offer a full installation and the everlasting replacement of your old battery system, including the removal and the professional disposal of the old batteries. This service will allow you not to bother any longer about unplanned investments and to get the maximum possible yield out of the system.

Prevention and maintenance

Maximum reliability and yield for your power supply system

The AUNILEC service department offers various contracts capable of meeting your requirements, both technically and economically, no matter what the usage area and the individual supply quality requests may be.

Our service contracts offer the highest possible protection for your applications, while maximising their operating time (+MTBF) and their duration.

You'll also be able to avoid incurring any costs associated with failures and unplanned downtime.

The AUNILEC service contracts include non-standard support by phone, a preliminary visit service meeting the AUNILEC manufacturer specifications and a reaction time specifically tailored on your needs; even material and labour costs in case of malfunctions will be tailored on your critical applications and on your investment plan.

Critical issues

- You can include in the service contract each and any installed UPS
- Our staff will agree with you the service dates
- A Pro-Life and Pro-Partner contract can only be signed before the expiry of the warranty period, or following a system audit or a second installation.

Information

- Any defect in system installation due to incorrect installation by unauthorised personnel will invalidate the AUNILEC warranty

SOLUTIONS	EASY	SMART	PREMIUM
Six-monthly checks			•
Corrective checks			•
Corrective material			•
Hardware upgrades			•
Material replacement		•	•
Yearly checks		•	•
Firmware upgrades	•	•	•
Guaranteed response time for materials	•	•	•
Guaranteed response time for service	•	•	•

Benefits of the AUNILEC service contracts for the customers

- Guaranteed response time
- Optimisation of work time and duration
- Substantial reduction of downtime costs and cost-optimised service
- Efficient on-site service by our qualified engineers
- Central storage of the data system and of the history, allowing to more promptly meet the requests for adaptations, conversions, support or failure analysis
- Drawing up of detailed, regular reports about the inspection and maintenance operations
- A single contact person for any request associated with the protection system of your installation
- Guaranteed use of genuine spare parts only

Repair and troubleshooting

Battery maintenance or monitoring

Battery maintenance for a reliable energy supply

All the batteries are subject to an ageing process and along time they lose a part of their capacity.
The battery maintenance and monitoring systems have a strong influence over the yield and reliability of the whole system.
They detect possible failures before they occur, thus allowing to promptly plan any required battery replacement.

The constant monitoring of voltage, current, temperature and charging/discharging behaviour allows to detect early enough any weak or damaged battery blocks, before the failure actually occurs.
This operation is performed automatically by the modern battery monitoring computer system “Falcon” (optional).
The continuous monitoring system immediately signals any overstepping of the allowed tolerances.

Critical issues

The battery monitoring system:
· is independent of the power supply system
· is available in both AC and DC systems
· monitors the lead and nickel accumulators

Information

The subsequent installation of an automated battery monitoring system is a typical example of an upgrade that will allow to spare recurring monthly control operations and to get greater reliability.

Benefits of battery maintenance and monitoring for the customers

· Reliable battery life
· Constant monitoring of the system batteries
· Early detection avoids risks that might result in a battery failure
· System battery life maximisation through proactive services and monitoring

Updates and changes

Updates and upgrades
Always state-of-the-art, even after years

Definition of "update": an update is the process through which something already existing is brought to a new status. An "update", therefore, requires the existence of a previous version.

Definition of "upgrade": an upgrade, sometimes called adjustment or advance, is an increase in the usefulness or quality of the hardware or software components.

Our partner systems have a life expectancy of 20 years for installations in standard industry plants. Your system will continue to enjoy the technological progresses and innovations even after its installation and commissioning.

We offer you updates and upgrades for both software and hardware tools. This way you will keep benefiting from new and future developments. The most recent software and hardware tools maximise the reliability and yield of your existing systems.

The update and upgrade program includes:
- illustration of the update and/or upgrade options
- assessment of all the available options
- drawing up of the best offer
- delivery, installation and commissioning by AUNILEC specialised engineers

Critical issues

- For systems that have been running for over 15 year, an update or an upgrade might not be cost-effective.
- The Premium service includes the main updates
- Updates and upgrades can be implemented during the yearly maintenance.

Information

- For any elucidation about the updates and upgrades available for your system, please contact our customer service.

Benefits of the AUNILEC updates and upgrades for the customers

- You can make your system more suitable for your needs by adding new useful functions, or functions that had been neglected during the initial commissioning
- The updates allow to reduce the maintenance costs and to improve yield
- Thanks to the updates you can enjoy the benefits of the latest technological discoveries

Aunilec is more...

UPS

Security lightning

Batteries
and capacitors

Active power filter

Voltage regulators
and network conditioners

Batteries and analysers

Solar technology

Ask us for our different product brochures
Get more infos at **www.aunilec.com**

The images are for illustrative purposes only

This catalogue is for information purposes.
Sizes and configurations are flexible and follow the technical specifications of our customers.

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