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# IT applications - Overview of Critical Power

**IT & Networking / Server rooms / IT infrastructure / Data centres**

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# Non-IT applications - Overview of Secure Power

Industrial and Manufacturing processes / Transport infrastructures / Medical equipment / Emergency systems

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</table>

- **MASTERYS IP+**
  - 24/48/108/120 V, 15 to 200 A
  - Rectifiers - up to 200 A
  - 1.5 - 6 kVA

- **DELPHYS MP Elite+**
  - 1.1 - 3.3 kVA
  - 1/1 - for marine applications

- **DELPHYS MX**
  - 1 - 3 kVA
  - 1/1 - for electrical substations

- **NETYS RT-M**
  - 1.1 - 3.3 kVA
  - 1/1 - for marine applications

- **ITYS ES**
  - 1 - 3 kVA
  - 1/1 - for electrical substations
<table>
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<th>Power Range</th>
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<td>Transport infrastructures</td>
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<tr>
<td>Medical equipment</td>
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<td>Emergency systems</td>
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</tbody>
</table>

**Complementary solutions**
Back-up storage, Static Transfer Systems (STS), Communication and connectivity, Power Distribution Unit (PDU)

- **Transformer-based UPS**
  - MASTERYS IP+
  - DELPHYS MP Elite+
  - DELPHYS MX

- **Industrial modular DC power**
  - SHARYS IP

- **Centralized Power Supply for emergency systems**
  - EMergency CPSS

- **Transformerless UPS systems**
  - MASTERYS GP
  - MASTERYS GP4
  - DELPHYS GP
  - MODULYS GP
  - MODULYS RM GP
  - DELPHYS XTEND GP

**Solutions for specific environments**
- NETYS RT-M
- ITYS ES

**General Catalogue 2018-2019**
For the energy performance of your critical installations

The benefit of a specialist

Since its foundation more than 95 years ago, SOCOMEC continues to design and manufacture its core products in Europe. Notably solutions for its primary mission: the availability, control and safety of low voltage electrical networks.

As an independent manufacturer, the Group is committed to constant innovation to improve the energy performance of electrical installations in infrastructures as well as industrial and commercial sites.

Throughout its history, SOCOMEC has constantly anticipated market changes by developing cutting-edge technologies, providing solutions that are adapted to customer requirements and fully in keeping with international standards.

“Optimising the performance of your system throughout its life cycle” - this is the commitment carried out every day by the SOCOMEC teams around the world, wherever your business is located.

1 independent manufacturer

3,500 m² of test platforms

10% of turnover invested in R&D

70,000 on-site interventions per year

One of the leading independent power testing labs in Europe

Always at the cutting-edge of technology for innovative, high-quality products

Nearly 400 experts in commissioning, technical audit, consultancy and maintenance
Your energy, our expertise

**Power conversion**  
*Ensuring the availability and storage of high quality power*

With its wide range of continuously evolving products, solutions and services, Socomec are recognised experts in the cutting-edge technologies used for ensuring the highest availability of the electrical power supply to critical facilities and buildings, including:
- static uninterruptible power supplies (UPS) for high-quality power free of distortions and interruptions occurring on the primary power supply,
- changeover of static, high availability sources for transferring the supply to an operational back-up source,
- permanent monitoring of the electrical facilities to prevent failures and reduce operating losses,
- energy storage for ensuring the proper energy mix of buildings and for stabilisation of the power grid.

**Power switching**  
*Managing power and protecting persons and facilities*

Active in the industrial switching market since its foundation in 1922, Socomec is today an undisputed leader in the field of low voltage switchgear, providing expert solutions that ensure:
- isolation and on load breaking for the most demanding switching applications,
- continuity of the power supply to electrical facilities via manual remotely operated or automatic transfer switching equipment,
- protection of persons and assets via fuse-based and other specialist solutions.

**Power monitoring**  
*Managing the energy performance of buildings*

Socomec solutions, from current sensors through to a wide choice of innovative scalable software packages are driven by experts in energy performance. They meet the critical requirements of facility managers and operators of commercial, industrial and local authority buildings for:
- measuring energy consumption, identifying sources of excess consumption and raising the awareness of occupants about their impact,
- limiting reactive energy and avoiding the associated tariff penalties,
- using the best available tariffs, checking utility bills and accurately distributing energy billing among consumer entities,
- monitoring and detecting insulation faults.

**Expert Services**  
*Enabling available, safe and efficient energy*

Socomec is committed to delivering a wide range of value-added services to ensure the reliability and optimisation of end-users’ equipment:
- prevention and service operations to lower the risks and enhance the efficiency of operations,
- measurement and analysis of a wide range of electrical parameters leading to recommendations for improving the site’s power quality,
- optimisation of the total cost of ownership and support for a safe transition when migrating from an old to a new generation of equipment,
- consultancy, deployment and training from the project engineering stage through to final procurement,
- performance assessment of the electrical installation throughout the life cycle of the products via analysis of data transmitted by connected devices.
Adapted solutions
to meet your energy objectives

SMART BUILDINGS
Reducing your energy bills and energy dependency
- DELPHYS MIX UPS
- DEPLHY5 MIX UPS
- COUNTIS E energy meter and DIRIS A multifunction meter (PMD)

NAVAL SHIPS
Energy conversion in environments with harsh restrictions
- SHARYS IP rectifier
- NETYS RT-M UPS
- UPS and other customised products
- SIRCO load break switches

SHOPPING CENTRES
Assuring your business continuity and visitor safety
- COUNTIS E energy meter and multi-utility pulse concentrator
- ATyS M automatic and remotely operated modular transfer switches
- MASTERSYS BC+ UPS
- EMERGENCY CPSS, secure power supply for emergency systems
- ENERGY MANAGEMENT software packages

PUBLIC DISTRIBUTION AND SMART GRID
Helping you to meet the challenge of energy demand and response
- SUNYSYS PCS² Power Conversion System and Storage
- DELPHYS MIX UPS
- SIRCO load break switches

RENEWABLE ENERGY
Guaranteeing the performance, security and durability of your photovoltaic facilities
- SUNYSYS PCS² Power Conversion System and Storage
- SIRCO load break switches with tripping function
- DEPLHY5 MIX UPS DC multi-circuit measurement system

GUARANTEEING THE PERFORMANCE, SECURITY AND DURABILITY OF YOUR PHOTOVOLTAIC FACILITIES

HELPING YOU TO MEET THE CHALLENGE OF ENERGY DEMAND AND RESPONSE

10 General Catalogue 2018-2019
Adapted solutions to meet your energy objectives

Energy conversion in environments with harsh restrictions

NAVAL SHIPS
NETYS RT-M
UPS
SHARYS IP rectifier
UPS and other customised products

DATA CENTRES
Reducing your energy bills and energy dependency

SMART BUILDINGS
ENERGY MANAGEMENT software packages
DIRIS Digiware AC
& DC multi-circuit measurement system
SUNSYS PCS²
Power Conversion System and Storage
ATyS automatic and remotely operated transfer switches
INOSYS LBS DC load break switches with tripping function

RENEWABLE ENERGY
Guaranteeing the performance, security and durability of your photovoltaic facilities

PUBLIC DISTRIBUTION AND SMART GRID
SUNSYS PCS² Power Conversion System and Storage
TIPI low-voltage feeder pillar with DIRIS multi-function meter
Auxiliary unit with ATyS transfer switch
SIRCO and SIDER load break switches

SHOPPING CENTRES
ENERGY MANAGEMENT software packages
COUNTIS E energy meter and multi-utility pulse concentrator
ATyS M automatic and remotely operated modular transfer switches
EMERGENCY CPSS, secure power supply for emergency systems
MASTERYS BC+ UPS

HEAVY INDUSTRY
FUSERBLOC fuse combination switches
SIRCO load break switches
MASTERYS GP4 UPS

MANDATORY EXPERT SERVICES
Ensuring patient safety and the energy performance of your hospital

INDUSTRY
Ensuring the competitiveness of your site

Modular and scalable UPS system
ATyS automatic and remotely operated transfer switches
MASTERYS GP4 UPS
DIRIS Q800 network analyser
MEDSYS medical IT cabinet

EXPERT SERVICES
We offer a wide range of value-added services ensuring the reliability of your equipment throughout its design life. Ask for personalised support -
SOCOMEC is committed to deliver a wide range of value-added services to ensure the availability of your critical installation, the safety of your site operations and the performance optimisation of your low voltage equipment during its life cycle. The expertise and proximity of our specialists are there to ensure the reliability and durability of your equipment.

Global presence
Nearly 400 Socomec experts supported by 200 engineers and technicians from our distributors, drive the solutions to your specific needs.

Our global presence includes:
• 10 branches in France,
• 12 European subsidiaries,
• 8 Asian subsidiaries,
• representatives in 70+ countries.
On-site service management
- 65,000 service operations per year (mainly preventive visits).
- 98% Service Level Agreement compliance rate.

Technical hotline network
- 20+ languages spoken.
- 3 advanced technical support centres.
- 100,000+ incoming calls handled per year.

Certified expertise
- 5,000 hours of technical training deployed per year (product, methodology and safety).

As specialist manufacturers in the field of low voltage electrical facilities for over 90 years, Socomec offers a wide range of value-added services, a major factor in ensuring the reliability of your equipment throughout its design life.

Take advantage of personalised support throughout your project and reach your energy objectives with confidence!

To find out more
For more information about our complete offer for Expert Services, download the catalogue.
www.socomec.com/en/services-catalogue
Critical equipment requires high quality energy and faultless continuity of the power supply. Our uninterruptible power systems (UPS), static transfer systems (STS), and DC/AC and AC/DC converters (inverters and rectifiers, respectively) comprise the most complete ranges in the world and cover a very wide range of applications for every sector of activity.

### High availability
The availability of electrical energy is a strategic factor in industries as varied as telecommunications, data processing centres and industrial processes. It is also vital for certain medical applications. In all these sectors, SOCOMEC offers you all the benefits of its 45 years of experience.

### Product solutions that meet requirements
Underspinned by significant R&D resources, our product offer continually evolves as a consequence of our contact with customers. Our products have gained approval from the most demanding users: telecoms operators, naval industry, etc.

### Customer-oriented service
Our extensive sales and after-sales network means we are always there for you. Our partner-customers recognise the quality of our products and their availability, as well as our flexibility and commitment to meeting requirements.

---

**Uninterruptible power supply systems (UPS)**

**Static transfer systems (STS)**

**Backup storage systems**

**Industrial rectifiers**

**DC/AC converters (inverters)**

**Communication and management software**

**Maintenance & Professional Services**

---

**A certified organisation**

---

**Local compliance**

- UL (USA)
- Gost (Russia)
- TLC (China)

---

**Environment**

- PEFC
- Eco Pass Port
- European Associations
- The Green Grid member

---

**Industrial sites**

- AFAC
- ENVEST
- ISO 50001
- Net Positive Impact

---
Critical equipment requires high quality energy and faultless continuity of the power supply. Our uninterruptible power systems (UPS), static transfer systems (STS), and DC/AC and AC/DC converters (inverters and rectifiers, respectively) comprise the most complete ranges in the world and cover a very wide range of applications for every sector of activity.

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For a high quality power supply

Innovative power solutions

High availability

The availability of electrical energy is a strategic factor in industries as varied as telecommunications, data processing centres and industrial processes. It is also vital for certain medical applications. In all these sectors, SOCOMEC offers you all the benefits of its 45 years of experience.

4 performance levers

The vision of a specialist

> Solutions focused on customer applications
> Listening to customers’ requirements
> Experienced personnel

The spirit of innovation

> Cutting-edge technologies
> Regular launch of new solutions
> Products and solutions

The focus on service

> Project consulting in design phases
> CIM worldwide organisation
> Audits & consulting

The know-how of a manufacturer

> A commitment to quality
> LEAN manufacturing
> The largest UPS manufacturing plant in Europe

Continuous innovation

1968

1st UPS

1987

1st Static Transfer System (STS)

1988

Transistor technology (600 kVA)

1989

IGBT & microprocessor

1990

Distributed parallel architecture

1994

Transformerless technology

1996

IGBT up to 800 kVA

1998

Digital Signal Processor (DSP)

2001

1st modular UPS

2003

IGBT rectifiers up to 200 kVA

2004

New battery charging design

2006

Dynamic Energy Storage System (Flywheel)

2008

High efficiency UPS

2010

Most compact 900 kVA UPS

2012

High power 3-level technology

2014

“Forever Young” design for modular UPS

2015

Real hot-scalable high power UPS system

Rack-mounted modular UPS system

2017

MASTERYS: 4th generation digital native UPS

‘Best-in-class’ manufacturer

F R O S T & S U L L I V A N

2003

Customer Service Excellence

2004

Customer Service Excellence

2006

Product Innovation

2009

Energy & Power Systems Product Line Strategy

2011

Product Innovation

2013

Product Differentiation Excellence

2014

European UPS Company of the Year

2015

European UPS Technology Leadership Award
Green solution to reduce energy consumption and environmental impact
Better products for sustainable applications

The EU Code of Conduct for Data Centers provides a platform that brings together European stakeholders to discuss and agree voluntary actions aimed at improving energy efficiency. It proposes general principles and practical actions to be followed by all parties involved in data centres, operating in the EU aiming for more efficient and economic use of energy, without jeopardizing the reliability and operational continuity of the services provided by data centres.

Socomec as Endorser has committed to help raise user awareness of energy efficiency issues, to introduce or encourage use of high efficiency products and promote the best practices set out in the Code of Conduct. Socomec has also committed to support the Code and Participants through the development of products, information, services, education or other programme. It also uses the Code to develop products and solutions to enable data centre owners and operators to meet the expectations of the Code of Conduct.

The UPS Code of Conduct sets out the basic principles to be followed by all parties involved in Uninterruptible Power Systems, operating in the European Community in respect of energy-efficient equipment. It addresses manufacturers who agree to make all reasonable efforts to improve the efficiency of their UPS equipment.

Socomec is one of the first manufacturers to sign the voluntary agreement. In so doing, Socomec has committed to make significant investment in innovative technologies for designing high efficiency UPS. Today, we are proud to state that all our product ranges exceed the required levels, allowing us to offer our customers the highest levels of performance on the market.
Green solution to reduce energy consumption and environmental impact

Better products for sustainable applications

The EU Code of Conduct for Data Centers provides a platform that brings together European stakeholders to discuss and agree voluntary actions aimed at improving energy efficiency. It proposes general principles and practical actions to be followed by all parties involved in data centres, operating in the EU aiming for more efficient and economic use of energy, without jeopardizing the reliability and operational continuity of the services provided by data centres.

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Socomec is a member of the TGG association, a global consortium dedicated to developing and promoting energy efficiency for data centres. The Green Grid works with end-users, technology providers and governments around the world to create standards for more efficient use of energy in data centres. Its members work to improve IT and data centre resource efficiency around the world.

The Green Grid offers the data centre expertise that governments turn to for industry insight and advice, bringing to bear the combined influence of a diverse body of ICT industry leaders. The consortium’s vendor-neutral dynamic creates a rich, collaborative environment of peers, competitors and industry experts that work closely together to advance the organisation’s mission.

Founded in Brussels in 2011, EUDCA is the only European-level non-profit association representing all aspects of the industry, from data centre operators to data centre users, suppliers, consultants and manufacturers. It is in EUDCA’s DNA to represent national associations but also to work with and promote them, for the purpose of the Industry’s development.

The EUDCA is the voice and ears of the European data centre industry that works to enhance the EU authorities’ understanding of the importance and status of the industry as well as assisting the industry in improving its best practices. Socomec signed up as a member of EUDCA in 2011 to play its role in helping to support and drive key objectives which are paramount to the future development and health of the data centre sector.

PEP Eco-passport®, is an international reference programme for environmental declarations of products from electric, electronic and heating & cooling industries. Socomec has been involved for more than 5 years in the PEP Eco-passport association. The company is actively involved in the internationalisation of the PEP Eco-passport programme and also in the European PEF initiative (Product Environmental Footprint) which aims to give a framework to UPS environmental declarations via European harmonised rules.

The Socomec UPS product ranges have a PEP Eco-passport, as is the case for example with our Green Power 2.0 UPS range.
Critical Power solutions

IT APPLICATION SOLUTIONS

Desktop / Tower UPS

- NETYS PL p. 20
- NETYS PE p. 22
- NETYS PR Mini Tower p. 24
- ITYS p. 36
- ITYS ES p. 38
- ITYS PRO p. 42

19" Rack & Rack/Tower convertible UPS

- NETYS PR Rack/Tower p. 26
- NETYS PR Rack 1U p. 28
- NETYS RT p. 30
- NETYS RT-M p. 34
- MODULYS RM GP p. 66

Single unit & 1+1 configuration UPS

- MASTERYS BC p. 44
- MASTERYS BC+ p. 46
- DELPHYS BC p. 48

Single & parallel UPS systems

- MASTERYS GP p. 50
- MASTERYS GP4 p. 52
- DELPHYS GP p. 54
- DELPHYS MX p. 74

Modular & scalable UPS systems

- MODULYS p. 40
- DELPHYS Xtend GP p. 56
- MODULYS GP p. 60
- MODULYS RM GP p. 66

NON-IT APPLICATION SOLUTIONS

Industrial rugged UPS for harsh environment

- MASTERYS IP+ p. 70

Transformer-based UPS

- DELPHYS MP Elite+ p. 72
- DELPHYS MX p. 74

Industrial modular DC power

- SHARYS IP p. 76

Centralized Power Supply for emergency systems

- EMergency CPSS p. 80
**NETYS PL**
User-friendly multi-socket protection
600 and 800 VA

An innovative solution and superior design
- Compact and practical pluggable power protection integrating a larger number of sockets adapted to computer and IT peripherals in small office and home office environments, facilitating connection and tidier cabling.
- Modern design suitable for positioning over/under the desk or floor installations.
- Complementary USB port on the top for recharging mobile devices (e.g. phones, MP3, etc.).

Adapted protection to meet all your needs
- 6 output sockets (British, French or German/Italian standards) for easy distribution directly to your applications:
  - 4 sockets protected against power cuts and overvoltages, aimed at your most sensitive applications (professional desk top systems, workstation and monitors). The back-up time (up to 30 minutes) enables standard PC tasks and configuration to be saved.
  - 2 sockets protected against overvoltage alone for use with less critical applications and high absorption consumers (e.g. laser printers).

Easy to use
- Operating mode indicated by means of the smart LED indicator lights.
- Easy battery maintenance and replacement.
- Integrated mains input cable on the side, allowing all six sockets to be used.

The solution for
- PC: LCD or CRT monitors, scanners, printers, etc.
- Cash registers
- Interactive terminals

Technology
- VFD "offline"

Certifications
- RoHS COMPLIANT

**Technical data**

<table>
<thead>
<tr>
<th>Model</th>
<th>VA</th>
<th>Power (surge)</th>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NETYS PL 600 VA</td>
<td>600</td>
<td>1200 VA</td>
<td>230 V</td>
<td>230 ±10%</td>
</tr>
<tr>
<td>NETYS PL 800 VA</td>
<td>800</td>
<td>1200 VA</td>
<td>230 V</td>
<td>230 ±10%</td>
</tr>
</tbody>
</table>

**Certifications**
- RoHS COMPLIANT

**Dimensions**
- NETYS PL 600 VA: 220 x 220 x 123 mm
- NETYS PL 800 VA: 220 x 220 x 123 mm

**Weight**
- NETYS PL 600 VA: 3.6 kg
- NETYS PL 800 VA: 4.1 kg

**Colour**
- Black
- White

**Voltage tolerance**
- 180 ÷ 270 V

**Rated voltage**
- 230 V

**Rated frequency**
- 50/60 Hz with automatic selection

**Wave form**
- Step wave

**Protection**
- Overload, significant discharge and short circuit

**Sockets**
- 4 sockets for UPS and surge protection, 2 sockets for surge protection

**Batteries**
- Type: Sealed lead-acid maintenance free - expected life 3/5 years

**Back-up time**
- 15 min 20 min

**Communication**
- Interfaces: USB

**UPS CABINET**
- Dimensions (W x D x H): 220 x 220 x 123 mm
- Weight: 3.6 kg 4.1 kg
- Colour: Black White

**Safety**
- IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2

**EMC**
- IEC/EN 62040-2, AS 62040.2

**Product declaration**
- CE, RCM (E2376)
**Connections**

1. Filtered output sockets
2. Inverter output sockets
3. LED
4. On/Off button
5. USB port to charge mobile devices
6. Fuse
7. USB serial port
8. Mains input cable

**Technical data**

<table>
<thead>
<tr>
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<th>NETYS PL 600 VA</th>
<th>NETYS PL 800 VA</th>
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<tbody>
<tr>
<td>Sn</td>
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<td>800 VA</td>
</tr>
<tr>
<td>Pn</td>
<td>360 W</td>
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<tr>
<td>Power (surge)</td>
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<td></td>
</tr>
<tr>
<td>Input/output</td>
<td>1/1</td>
<td></td>
</tr>
</tbody>
</table>

**INPUT**

- Rated voltage: 230 V
- Voltage tolerance: 180 ÷ 270 V
- Rated frequency: 50/60 Hz with automatic selection
- Mains connection: Cable with plug

**OUTPUT**

- Rated voltage: 230 V ±10%
- Rated frequency: 50/60 Hz ±1%
- Wave form: Step wave
- Protection: Overload, significant discharge and short circuit
- Sockets: 4 sockets for UPS and surge protection, 2 sockets for surge protection
- Socket standard: British, French or German/Italian

**BATTERIES**

- Type: Sealed lead-acid maintenance free - expected life 3/5 years
- Back-up time: 15 min 20 min

**COMMUNICATION**

- Interfaces: USB
- Local communication software: Local View

**UPS CABINET**

- Dimensions W x D x H: 220 x 220 x 123 mm
- Weight: 3.6 kg 4.1 kg
- Colour: Black White

**STANDARDS**

- Safety: EC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
- EMC: EC/EN 62040-2, AS 62040.2
- Product declaration: CE, RCM (C2378)

(1) PC + 17” LCD monitor.

**Socket types**

- French socket
- German/Italian socket
- British socket

**Standard electrical features**

- USB port to charge mobile devices

**Standard communication features**

- LOCAL VIEW: ideal UPS monitoring and shutdown point-to-point solution for Windows®, Linux and Mac OS X® operating systems.
NETYS PE
Practical and cost-effective protection from 600 to 2000 VA

Ideal and cost-effective protection for SOHO or POS applications

- Adapted to protect IT applications in home, office and retail environments.
- A complete range of six models to adapt the power to the equipment’s consumption or to required back-up time.

Easy to use

- Control panel with graphical icons LCD/LEDs allowing the operating mode to be easily monitored.

A solution for network power cuts and voltage fluctuations

- The integrated AVR function (Automatic Voltage Regulation) stabilizes the output voltage and avoids the switching to Battery Mode operation, therefore saving the battery to support critical power cut events.

Simplified connection

- Several IEC 320 sockets (IT standard) simplify the connectivity to computer and IT peripherals.

Protection for your data line

- Integrated NTP protection for LAN/ADSL connection against the risk of data line overvoltage.

NETYS PE

Practical and cost-effective protection from 600 to 2000 VA

The solution for

- CAD, graphic workstations
- Multimedia workstations and peripherals
- LCD screens and monitors
- POS (Points Of Sales)

Technology

- VI “line interactive” with AVR, step wave

Certifications

RoHS COMPLIANT

Technical data

<table>
<thead>
<tr>
<th>Model</th>
<th>VA</th>
<th>Pn</th>
<th>Input / output</th>
</tr>
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<tbody>
<tr>
<td>NETYS PE 600/850/850 VA</td>
<td>600</td>
<td>360 W</td>
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<td>NETYS PE 850 VA</td>
<td>650</td>
<td>360 W</td>
<td>1/1</td>
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<td>NETYS PE 1000 VA</td>
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<td>NETYS PE 1500/2000 VA</td>
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<td>900 W</td>
<td>1/1</td>
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<td>NETYS PE 2000 VA</td>
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<table>
<thead>
<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>Voltage tolerance</td>
<td>170 - 280 V</td>
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<tr>
<td>Rated frequency</td>
<td>50/60 Hz with automatic selection</td>
</tr>
<tr>
<td>Wave form</td>
<td>Step wave</td>
</tr>
<tr>
<td>Connections</td>
<td>4 x IEC 320 (C13)(1) 6 x IEC 320 (C13)(1)</td>
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<tr>
<td>Batteries</td>
<td>Sealed lead-acid maintenance free - expected life 3/5 years</td>
</tr>
<tr>
<td>Back-up time (2)</td>
<td>15 min 15 min 20 min 45 min 55 min 60 min</td>
</tr>
<tr>
<td>Communication</td>
<td>USB</td>
</tr>
<tr>
<td>UPS CABINET</td>
<td>Dimensions W x D x H 100 x 300 x 145 mm 145 x 345 x 165 mm 145 x 390 x 205 mm</td>
</tr>
<tr>
<td>Weight</td>
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</tbody>
</table>

(1) Australian standard sockets on Netys PE models specific for Australia.
(2) PC + 17” LCD monitor.
Single-phase UPS
Ideal and cost-effective protection for SOHO or POS applications
• Adapted to protect IT applications in home, office and retail environments.
• A complete range of six models to adapt the power to the equipment’s consumption or to required back-up time.

Easy to use
• Control panel with graphical icons LCD/LEDs allowing the operating mode to be easily monitored.

A solution for network power cuts and voltage fluctuations
• The integrated AVR function (Automatic Voltage Regulation) stabilizes the output voltage and avoids the switching to Battery Mode operation, therefore saving the battery to support critical power cut events.

Simplified connection
• Several IEC 320 sockets (IT standard) simplify the connectivity to computer and IT peripherals.

Protection for your data line
• Integrated NTP protection for LAN/ADSL connection against the risk of data line overvoltage.

**NETYS PE**
Practical and cost-effective protection from 600 to 2000 VA

The solution for
• CAD, graphic workstations
• Multimedia workstations and peripherals
• LCD screens and monitors
• POS (Points Of Sales)

**GAMME 253 A**
- NETYS PE 600 / 650 / 850 VA
- NETYS PE 1000 VA
- NETYS PE 1500 / 2000 VA

**Technical data**

<table>
<thead>
<tr>
<th>NETYS PE</th>
<th>600 / 650 / 850 VA</th>
<th>1000 VA</th>
<th>1500 VA</th>
<th>2000 VA</th>
</tr>
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<td>INPUT</td>
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<td>230 V</td>
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<td>50/60 Hz with automatic selection</td>
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<tr>
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<td>Step wave</td>
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<td>Protection</td>
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<td>Data Line protection</td>
<td>- NTP data line suppressor</td>
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<td>UPS CABINET</td>
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<td>Product declaration</td>
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</table>

(1) Australian standard sockets on Netys PE models specific for Australia.
(2) PC + 17” LCD monitor.

**Standard communication features**
• LOCAL VIEW: ideal UPS monitoring and shutdown point-to-point solution for Windows®, Linux and Mac OS X® operating systems.

---

Control panel

Connections

600 / 650 / 850 VA

1. Alarm
2. Operation with battery
3. Normal operation
4. On / Off
5. Load present
6. Load level (5 steps)

1000 / 1500 / 2000 VA

7. General Alarm
8. Battery fault / Replace the battery
9. Overload
10. Battery capacity
11. Normal mode / Battery mode (flashing)
12. Automatic Voltage / Regulation active


---

General Catalogue 2018-2019
**NETYS PR**

Space saving reliable protection from 1000 to 2000 VA - Mini Tower

The solution for

- Professional and IT equipment
- Servers and networking devices
- CAD / graphic workstations with monitors and peripherals
- Control systems

**Technology**

- VI "line interactive" with AVR, sine wave

**Certifications**

- RoHS COMPLIANT

---

**Professional line interactive UPS**

- Ideal solution for protecting small servers and high performance CAD or graphic workstations.
- Assures service continuity to critical applications.
- Designed for professional applications: the sine wave inverter technology assures full compatibility with any kind of load and power supply.
- Minitower case to easily fit close to the IT load to be supplied and protected.

**A solution for network power cuts and voltage fluctuations**

- The integrated AVR function (Automatic Voltage Regulation) stabilizes the output voltage and avoids the switching to Battery Mode operation, therefore saving the battery to support critical power cut events.

**Easy to use**

- Control panel with graphical icons LCD allowing the operating mode to be easily monitored.

**Simplified connection**

- Several IEC 320 sockets (IT standard) simplify the connectivity to computer and IT peripherals.

**Protection for your data line**

- Integrated NTP protection for LAN/ADSL connection against the risk of data line overvoltage.
**Connections**

1. USB serial port
2. NTP data line suppressor
3. UPS output sockets
4. Input socket and fuse
5. Fan / air vents

**Technical data**

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<thead>
<tr>
<th>NETYS PR Mini Tower</th>
<th>Sn 1000 VA</th>
<th>1500 VA</th>
<th>2000 VA</th>
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<td>Voltage tolerance</td>
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<tr>
<td>Rated voltage</td>
<td>230 V ±10%</td>
<td></td>
<td></td>
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<tr>
<td>Rated frequency</td>
<td>50/60 Hz ±1%</td>
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<tr>
<td>Wave form</td>
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<td>protection</td>
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<tr>
<td>Back-up time (1)</td>
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<td>COMMUNICATION</td>
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<td>Interfaces</td>
<td>USB</td>
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<td>NTP data line suppressor</td>
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<td>Dimensions W x D x H</td>
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<tr>
<td>Product declaration</td>
<td>CE, RCM (E2376)</td>
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<td></td>
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</table>

(1) PC + 17” LCD monitor.

**Standard communication features**

- LOCAL VIEW: ideal UPS monitoring and shutdown point-to-point solution for Windows®, Linux and Mac OS X® operating systems.
A secure and professional supply continuity

- Ideal solution for protecting small servers, networking devices and peripherals.
- Assures service continuity to critical applications.
- Designed for professional applications: the sinewave inverter technology assures full compatibility with any kind of load and power supply.

Tailored to IT networking

- The space and time-saving tower/rack conversion option means it can be installed easily either in tower mode or inside standard 19” rack cabinets depending on the user’s needs.

Simple to install

- No configuration needed on first startup.
- Compact footprint (2U/89 mm) for installation in rack cabinets.
- Attractive design for visible installation in offices.
- USB port and HID protocol as standard for direct interfacing with Windows® systems, without the need for additional specialist software.

Protection for your data line

- Integrated NTP protection for LAN/ADSL connection against the risk of data line overvoltage.

Meets practical needs

- Optional battery extension modules (EBM) to meet all back-up time requirements, even after installation.
- Clear and uncluttered LCD interface, with buzzers that immediately indicate the operating status of the UPS, even for less specialist users.
- Simplified maintenance and Battery ‘hot swap’, without closing down other applications.

Easy to use and to integrate

- Wide range of communication protocols available in options (including JBUS, TCP/IP and SNMP) for integration into LAN networks or building management systems (BMS).
- Easy connections to the applications (depending on power) via 8 or 8+1 IEC 320 (IT standard) sockets.
- Load segmentation function to prioritize loads and manage critical situations.
- EPO (Emergency Power Off) emergency stop.
- RS232 advanced connections for the management of the power supply and local/remote shutdown of applications.
Connections

- 1. Fan / air vents
- 2. EPO Emergency Power Off
- 3. USB serial port
- 4. RS232 serial port
- 5. Connector for external battery extension
- 6. UPS output sockets (2 segments)
- 7. NTP protections (RU45)
- 8. Slot for optional communication boards
- 9. Input socket
- 10. UPS full power output socket

Control panel

- 1. On / Off
- 2. Load present
- 3. Load level (5 steps)
- 4. General Alarm
- 5. Battery fault / Replace the battery
- 6. Overload
- 7. Battery capacity
- 8. Normal mode / Battery mode (flashing)
- 9. Automatic Voltage / Regulation active
- 10. Configuration
- 11. Programmable outlets
- 12. Input value
- 13. UPS test / Buzzer off
- 14. Navigator button
- 15. Enter

Technical data

NETYS PR Rack/Tower

<table>
<thead>
<tr>
<th>Sn</th>
<th>1700 VA</th>
<th>2200 VA</th>
<th>3300 VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph</td>
<td>1350 W</td>
<td>1800 W</td>
<td>2700 W</td>
</tr>
<tr>
<td>Input/output</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
</tr>
</tbody>
</table>

INPUT

- Rated voltage: 230 V
- Voltage tolerance: 161 V ±4% (selecting wide mode) / -76 V ±4%
- Rated frequency: 50/60 Hz with automatic selection
- Mains connection: IEC320-C14 (10 A) / IEC320-C20 (16 A)

OUTPUT

- Automatic Voltage Regulation (AVR)
  - The AVR increases (boost 1) the output voltage by 14% when the input voltage drops below 56% of the nominal value.
  - The AVR decreases (buck) the output voltage by 12% when the input voltage rises above 106% of the nominal value.
- Rated voltage: 230 V ±5%
- Rated frequency: 50/60 Hz ±0.1%
- Power factor: 0.9 @ 1500 VA / 0.9 @ 2000 VA / 0.9 @ 3000 VA
- Waveform: Sine wave
- Protection
  - Normal Mode: overload (110% for 3 minutes)
  - Battery Mode: overload (110% for 39 seconds), short-circuit protected
- Connections: 8 (10 A) x IEC 320 / 8 (10 A) x IEC 320

BATTERIES

- Type: Sealed lead-acid maintenance free - expected life 3/5 years
- Back-up time:
  - 6 min
  - 8 min
  - 6 min

COMMUNICATION

Interfaces: RS232, USB
- Ethernet adapter: NET VISION (TCP/IP & SNMP) optional card
- Local communication software: Local View
- Data line protection: NTP data line suppressor: RU45 10 Base T
- UPS cabinet
  - Dimensions W x D x H: 440 x 436 x 87 mm
  - Weight: 18 kg / 28.2 kg / 31.5 kg

STANDARDS

- Certification: CE, RoHS
- EMC: IEC62040-2, AS 62040.2
- Product declaration: CE, ROM [2378]

Standard communication features

- LOCAL VIEW: ideal UPS monitoring and shutdown point-to-point solution for Windows®, Linux and Mac OS X® operating systems.
- HID: UPS management based on Windows® and Mac OS X® embedded service - USB interface.
- MODBUS RTU (RS232).

Communication options

- NET VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.
- Dry-contact interface.
- Rails

Battery extensions

NETYS PR

<table>
<thead>
<tr>
<th>Sn</th>
<th>1700 VA</th>
<th>2200 VA</th>
<th>3300 VA</th>
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<tbody>
<tr>
<td>Exit</td>
<td>22 min</td>
<td>42 min</td>
<td>43 min</td>
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</table>
NETYS PR
High density, compact power protection on rack
1000 and 1500 VA - Rack 1U

A professional UPS
- Designed for professional environments, protection against power cuts and over voltage is ensured by Line Interactive technology with Automatic Voltage Regulation (AVR).

An installation adapted to the networking environment
- NETYS PR rack provides high power density (1U - 45 mm) which conserves valuable space in the rack for other equipment.
- Can be easily installed in 19" and 23" Rack cabinets, depending on the user’s needs. The UPS is provided with rails and mounting accessories.

Adapted connections
- Easy connections to the applications via 4 IEC 320 (IT standard) sockets.

Data line protection
- With RJ45 connector.

Communication with the computer system
- RS232 or USB advanced connections for the management of the power supply and local / remote shutdown of applications.
- Advanced diagnostics and remote control via various protocols and user environments: jBUS, HID, SNMP, TCP/IP.

The solution for
- Professional and IT equipment
- Servers and networking devices
- CAD / graphic workstations with monitors and peripherals
- Control systems

Technology
- VI “line interactive” with AVR, sine wave

Certifications
- RoHS COMPLIANT
Single-phase UPS

A professional UPS

- Designed for professional environments, protection against power cuts and overvoltage is ensured by Line Interactive technology with Automatic Voltage Regulation (AVR).

Installation adapted to the networking environment

- NETYS PR rack provides high power density (1U - 45 mm) which conserves valuable space in the rack for other equipment.

- Can be easily installed in 19" and 23" Rack cabinets, depending on the user’s needs. The UPS is provided with rails and mounting accessories.

Adapted connections

- Easy connections to the applications via 4 IEC 320 (IT standard) sockets.

Data line protection

- With RJ45 connector.

Communication with the computer system

- RS232 or USB advanced connections for the management of the power supply and local/remote shutdown of applications.

- Advanced diagnostics and remote control via various protocols and user environments: JBUS, HID, SNMP, TCP/IP.

NETYS PR

High density, compact power protection on rack

1000 and 1500 VA - Rack 1U

The solution for

- Professional and IT equipment
- Servers and networking devices
- CAD / graphic workstations with monitors and peripherals
- Control systems

Technology

- VI "line interactive" with AVR, sine wave

NETYS 090 A

Battery Hot-swap

- Battery can be hot-swapped without having to shut down the connected equipment.
- Battery can be replaced from the front without removing and disconnecting the UPS.
- Battery check system and replacement indicator.

Technical data

<table>
<thead>
<tr>
<th>NETYS PR Rack 1U</th>
<th>Sn</th>
<th>1000 VA</th>
<th>1500 VA</th>
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<tbody>
<tr>
<td>Sn</td>
<td>1000 VA</td>
<td>1500 VA</td>
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<tr>
<td>Pn</td>
<td>670 W</td>
<td>1000 W</td>
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<tr>
<td>INPUT</td>
<td>Rated voltage</td>
<td>230 V (default), 220 V, 230 V, 240 V selectable</td>
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<tr>
<td>OUTPUT</td>
<td>Rated frequency</td>
<td>50/60 Hz auto-sensing</td>
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<tr>
<td>Rated voltage</td>
<td>230 V</td>
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</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
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<td>Sockets</td>
<td>4 x IEC 320 (10 A)</td>
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<td>Data line protection</td>
<td>NTP data line suppressor: RJ45 10 Base T</td>
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<tr>
<td>BATTERIES</td>
<td>Type</td>
<td>sealed lead-acid maintenance free - expected life 3/5 years</td>
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<tr>
<td></td>
<td>Back-up time (1)</td>
<td>12 min</td>
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<tr>
<td>COMMUNICATION</td>
<td>Interfaces</td>
<td>RS232 - USB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Local communication software</td>
<td>Local View</td>
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<tr>
<td>UPS CABINET</td>
<td>Dimensions W x D x H</td>
<td>440 x 578 x 44.5 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight</td>
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<td>23 kg</td>
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<td>STANDARDS</td>
<td>Safety</td>
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<tr>
<td></td>
<td>EMC</td>
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<td>Product declaration</td>
<td>CE, IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2</td>
<td></td>
</tr>
</tbody>
</table>

(1) PC + 15" LCD monitor.

Included

- Mounting bracket for 19" rack
- Adjustable rails

Standard communication features

- LOCAL VIEW: ideal UPS monitoring and shutdown point-to-point solution for Windows®, Linux and Mac OS X® operating systems.
- HID: UPS management based on Windows® and Mac OS X® embedded service - USB interface.
- MODBUS RTU (RS232).

Communication options

- NET VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.
NETYS RT
Total protection on rack or tower from 1100 to 11000 VA

High protection and availability
- Online double conversion technology with sinusoidal waveform, completely filters out all disturbances from / to the mains power supply and ensures maximum protection of the utility.
- Permanent regulation of output voltage and frequency.
- Wide tolerance of the input voltage reduces switchovers to battery mode, prolonging battery life.

Simple to install
- No configuration necessary on first startup.
- Space and time saving “tower-to-rack” conversion mode.
- IEC input and output connections (1100-3300 VA) or terminal input and output connections with built-in magnetothermal input switch (5000-11000 VA).
- Compact footprint (tower mode).
- Compact rack enclosure saving valuable cabinet rack space.

Easy to use
- Clear and uncluttered LCD interface, with buzzers that immediately indicate the operating status of the UPS, even for less specialist users.
- Wide range of communication protocols for integration into LAN networks or Building Management Systems (BMS).
- Load segmentation function to prioritize loads and manage critical situations.
- EPO (Emergency Power Off).
- RS232 advanced connection for the management of power supply and local/remote shutdown of the applications.

Meets practical needs
- Modular battery extension (EBM) to meet all back-up time requirements, even after installation.
- Possibility of 1+1 parallel redundant configuration to maximise the availability of critical utilities, even in the event of a module breakdown (5000-11000 VA).

The solution for
- Switching
- Storage
- Servers and networking devices
- VoIP communication systems
- Structured cabling systems
- Control systems
- Video surveillance systems

Technology
- VFI “online double conversion”

Certifications
- TUV
- GS
- RoHS

Advantages
- HID: UPS management based on Windows® and Mac OS X® embedded systems.
- Windows®, Linux and Mac OS X® operating systems.
- Environmental Monitoring Device (EMD).
- MODBUS RTU (RS232).
- RT-VISION: professional WEB/SNMP management of several operating systems (1100-3300 VA).
- 1+1 parallel redundant function.
Simple to install
High protection and availability

- Compact rack enclosure saving valuable space and time saving 'tower-to-rack' configuration to maximise the availability of all back-up time requirements, even after local / remote shutdown of the applications.
- No configuration necessary on first startup.
- IEC input and output connections with built-in magnetothermal conversion mode.
- Online double conversion technology with wide tolerance of the input voltage reduces permanent regulation of output voltage and online double conversion VFI with input PFC and automatic bypass.
- VFI "online double conversion" architecture:
  - Video surveillance systems
  - Control systems
  - Structured cabling systems
  - VoIP communication systems
  - Storage
  - Switching

Electrical options

- 1+1 parallel module (5000-11000 VA).
- Battery extension modules.
- Manual bypass without interruption (5000-11000 VA).
- Hot-swap manual bypass (1100-3300 VA).
- Portable multiple German standard outlets with cable and IEC 320-C20 plug.

Technical data

<table>
<thead>
<tr>
<th>NETYS RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Se</td>
</tr>
<tr>
<td>Ps</td>
</tr>
<tr>
<td>Architecture</td>
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<tr>
<td>Parallel redundant function</td>
</tr>
<tr>
<td>INPUT Voltage</td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Power factor / THDi</td>
</tr>
<tr>
<td>Input socket</td>
</tr>
<tr>
<td>OUTPUT Voltage</td>
</tr>
<tr>
<td>Power factor</td>
</tr>
<tr>
<td>Efficiency</td>
</tr>
<tr>
<td>Overload capability</td>
</tr>
<tr>
<td>Overload connections</td>
</tr>
<tr>
<td>BATTERY Voltage</td>
</tr>
<tr>
<td>Recharge time</td>
</tr>
<tr>
<td>COMMUNICATION Minicom panel</td>
</tr>
<tr>
<td>RS232 MODBUS protocol</td>
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<td>USB HID protocol</td>
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<tr>
<td>WEB/SNMP (Ethernet RJ45 port)</td>
</tr>
<tr>
<td>COMM slot</td>
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<td>Dry contacts card</td>
</tr>
<tr>
<td>EPO input (RJ11 port)</td>
</tr>
<tr>
<td>Parallel port</td>
</tr>
<tr>
<td>STANDARDS Safety</td>
</tr>
<tr>
<td>EMC</td>
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<tr>
<td>Performance</td>
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<td>Product declaration</td>
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<tr>
<td>ENVIRONMENT Operating ambient temperature</td>
</tr>
<tr>
<td>Storage temperature range</td>
</tr>
<tr>
<td>Relative Humidity</td>
</tr>
<tr>
<td>Noise level (ISO 3746)</td>
</tr>
<tr>
<td>UPS CABINET UPS size std (W x D x H)</td>
</tr>
<tr>
<td>UPS size RACK</td>
</tr>
<tr>
<td>UPS weight std</td>
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<tr>
<td>IP rating</td>
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<tr>
<td>EBM module size (W x D x H)</td>
</tr>
<tr>
<td>EBM module RACK</td>
</tr>
<tr>
<td>EBM module weight</td>
</tr>
</tbody>
</table>

Communication options

- RT-VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems (1100-3300 VA).
- Dry-contact interface.
- Environmental Monitoring Device (EMD).

Standard electrical features

- Built-in backfeed protection.
- RJ11 connection for Emergency Power Off (EPO).
- Connection for battery extension modules.
- Port for parallel operation (5000-11000 VA).

Standard communication features

- LOCAL VIEW: ideal UPS monitoring and shutdown point-to-point solution for Windows®, Linux and Mac OS X® operating systems.
- HID: UPS management based on Windows® and Mac OS X® embedded service - USB interface (1100-3300 VA).
- MODBUS RTU (RS232).
- RT-VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems (5000-11000 VA).

Technical data

<table>
<thead>
<tr>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical options</td>
</tr>
<tr>
<td>Network options</td>
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<tr>
<td>Safety</td>
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<tr>
<td>EMC</td>
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<tr>
<td>Performance</td>
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<td>Product declaration</td>
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<tr>
<td>ENVIRONMENT</td>
</tr>
<tr>
<td>Storage temperature range</td>
</tr>
<tr>
<td>Relative Humidity</td>
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<td>Noise level (ISO 3746)</td>
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<td>UPS CABINET</td>
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<td>UPS size RACK</td>
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<td>UPS weight std</td>
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<tr>
<td>IP rating</td>
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<tr>
<td>EBM module size (W x D x H)</td>
</tr>
<tr>
<td>EBM module RACK</td>
</tr>
<tr>
<td>EBM module weight</td>
</tr>
</tbody>
</table>

NETYS RT Single-phase UPS from 1100 to 11000 VA

General Catalogue 2018-2019 31
NETYS RT
Single-phase UPS
from 1100 to 11000 VA

Connections

1. Mains input socket (IEC 320)
2. Fan
3. Output socket (full power)
4. EPO (Emergency Power Off) input
5. RS232 interface (MODBUS protocol)
6. USB port
7. Input protection
8. Output sockets (IEC 320 - 10 A)

9. Connector for external battery extension
10. Slot for optional communication boards
11. Battery extension connector
12. Output terminals
13. Input terminals
14. Input switch
15. RJ45 LAN ethernet connector
16. Parallel port connector

Electrical options

Portable multiple German standard sockets
Manual bypass (5000-11000 VA)
Hot-swap manual bypass (1100-3300 VA)

Converts from Tower to Rack mounted

1100 VA

1100 VA

1100 VA

1100 VA

1700 VA - 2200 VA - 3300 VA

9000 VA - 11000 VA + battery

5000 VA - 7000 VA + battery

9000 VA - 11000 VA + battery

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.
NETYS RT 1100-3300 VA - Battery extension

<table>
<thead>
<tr>
<th>UPS</th>
<th>EBM</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRT2-U1100K</td>
<td>Internal</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U1100K</td>
<td>1 x NRT-B1100K</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U1100K</td>
<td>2 x NRT-B1100K</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U1700K</td>
<td>Internal</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U1700K</td>
<td>1 x NRT-B12200K</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U1700K</td>
<td>2 x NRT-B12200K</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U2200K</td>
<td>Internal</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U2200K</td>
<td>1 x NRT-B2200K</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U2200K</td>
<td>2 x NRT-B2200K</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U3300K</td>
<td>Internal</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U3300K</td>
<td>1 x NRT-B3000K</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U3300K</td>
<td>2 x NRT-B3000K</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
</tbody>
</table>

Parallel redundant operation for business continuity

To achieve the highest level of availability and to power critical utilities, NETYS RT UPS modules above 3.3 kVA can be configured for 1:1 redundancy. Redundant operation (1+1) means: the system incorporates one more UPS module than is needed to protect the load; in the event of a breakdown, it guarantees sufficient power supply capacity to the load by maintaining online protection. Parallel technology is based on the principle of load sharing, whereby both units are always kept active.

In a redundant configuration, overall system availability is much higher than a conventional UPS system using similar technology. 1+1 redundant configuration does not require additional circuits and can therefore be set up at a later date, simply by using two UPS modules and a collector/manual bypass module which simplifies cabling and maintenance of the UPS installation.

To further streamline the solution, it is also possible to select between operation with separate battery or shared battery, which is extremely useful in the case of applications requiring high levels of autonomy.

Control panel

1. Yellow LED lit. Operation in bypass mode
2. Green LED lit. Mains healthy
3. OFF button
4. Green LED lit. Normal operation (inverter in-line)
5. ON/TEST and buzzer override button
6. Navigator button
7. Alphanumeric LCD display
8. Green LED lit. Status of the load
9. Load status
10. Configuration
11. Programmable outlets
12. Battery status
13. Load level (5 steps)
14. Buzzer off
15. Load present
16. Battery fault / Replace the battery
17. General alarm
18. Overload
19. Input value
20. Normal mode / Battery mode (flashing)
**NETYS RT-M**

**Solution for marine applications from 1100 to 3300 VA**

High availability in marine environments

The marine industry calls for reliable equipment which is able to supply applications operating in harsh environments. In such a context, power outages cause extremely serious problems to critical equipment for the navigation system, and communication and engine controls, which leads to costs increasing. In line with the company’s commitment to develop innovative solutions to ensure availability, improve energy efficiency and reduce costs, SOCOMEC has introduced NETYS RT-M, high-performance UPS DNV GL standard certified.

Easy to use

- Easy configurable frequency converter operation (50 Hz, 60 Hz).
- No configuration necessary on first startup.
- Wide range of communication protocols (including TCP/IP and SNMP) for integration into LAN networks or building management systems (BMS).

Meets practical needs

- Online double conversion technology with sinusoidal waveform, to completely filter out all disturbances from / to the mains power supply and to ensure maximum protection of the equipment.
- Optional battery extension modules (EBM) to meet wide back-up time requirements, even after installation.
- Clear and uncluttered LCD interface, with buzzers that immediately indicate the operating status of the UPS, even for less specialist users.

The solution for

- Steering systems
- Bridge systems
- Radar systems
- Control systems
- Video surveillance systems

Certifications

- DNV-GL Standard certified.
- UPS DNV GL standard certified.
- TUV / GS marked.
- RoHS compliant.
- EPO input.
- RJ11 port.
- Dry contacts card option
- 1 available as standard.
- COMM slots.
- WEB / SNMP (Ethernet RJ45 port) - option
- RS232 (DB9 port) MODBUS protocol, USB HID protocol

Technical data

**NETYS RT-M Solution for marine applications**

- Single-phase UPS
- Single-phase UPS

The solution for

- Steering systems
- Bridge systems
- Radar systems
- Control systems
- Video surveillance systems

Meets practical needs

- Online double conversion technology with sinusoidal waveform, to completely filter out all disturbances from / to the mains power supply and to ensure maximum protection of the equipment.
- Optional battery extension modules (EBM) to meet wide back-up time requirements, even after installation.
- Clear and uncluttered LCD interface, with buzzers that immediately indicate the operating status of the UPS, even for less specialist users.

Easy to use

- Easy configurable frequency converter operation (50 Hz, 60 Hz).
- No configuration necessary on first startup.
- Wide range of communication protocols (including TCP/IP and SNMP) for integration into LAN networks or building management systems (BMS).
NETYS RT-M
Single-phase UPS from 1100 to 3300 VA

Technical data

<table>
<thead>
<tr>
<th>NETYS RT-M</th>
<th>1100 VA</th>
<th>1700 VA</th>
<th>2200 VA</th>
<th>3300 VA</th>
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<tbody>
<tr>
<td>Sn</td>
<td>1100 VA</td>
<td>1700 VA</td>
<td>2200 VA</td>
<td>3300 VA</td>
</tr>
<tr>
<td>Ph</td>
<td>900 W</td>
<td>1350 W</td>
<td>1800 W</td>
<td>2700 W</td>
</tr>
</tbody>
</table>

**INPUT**
- Rated voltage: 230 V (1ph)
- Voltage tolerance: ±10% for 120V @ 70% load
- Rated frequency: 50/60 Hz
- Frequency tolerance: ±10% (Auto-Selectable)
- Power factor / THDI: > 0.99 / < 5%

**OUTPUT**
- Rated voltage: 230 V (1ph)
- Voltage tolerance: selectable 200/208/220/240 V
- Rated frequency: 50 or 60 Hz
- Frequency tolerance: ±2% (< 0.05 Hz in battery mode)
- Power factor: 0.9 @ 1000 VA 0.9 @ 1500 VA 0.9 @ 2000 VA 0.9 @ 3000 VA
- Efficiency: up to 93% online mode
- Overload capability: up to 105% continuously, 125% for 3 min, 150% for 30 s
- Connections: 6 x IEC 320-C13 (10 A) 6 x IEC 320-C13 (10 A) + 1 x IEC 320-C19 (16 A)
- BATTERY
  - Standard autonomy: 8 min 12 min 8 min 10 min
  - Voltage: 24 VDC 48 VDC 72 VDC
  - Recharge time: < 6 hours to recover 90% capacity

**COMMUNICATION**
- Interfaces: RS232 (DB9 port) MODBUS protocol, USB HID protocol
- Ethernet: WEB / SNMP (Ethernet RJ45 port) - option
- Dry contacts card: 1 available as standard
- EPO input: option
- RJ11 port: option

**ENVIRONMENT**
- Operating ambient temperature: from 0 °C up to +40 °C (from 15 °C to 25 °C for maximum battery life)
- Relative humidity: Temperature class A according to DNV GL
- Relative humidity: 5-95% non-condensing
- Maximum altitude: 1000 m without derating (max. 3000 m)
- Noise level (ISO 3746): < 45 dBA < 50 dBA

**UPS CABINET**
- Dimensions W x D x H: 89 x 333 x 440 mm 89 x 430 x 440 mm 89 x 608 x 440 mm
- Dimensions RACK U: 2U
- Weight: 13 kg 18 kg 19 kg 30 kg
- Degree of protection: IP20

**EBM - EXTERNAL BATTERY MODULE**
- Dimensions W x D x H: 89 x 333 x 440 mm 89 x 430 x 440 mm 89 x 608 x 440 mm
- Dimensions RACK U: 2U
- Weight: 16 kg 29 kg 29 kg 43 kg

**STANDARDS**
- Safety: IEC EN 62040-1, AS 62040.1.1, AS 62040.1.2
- EMC: IEC EN 62040-2, AS 62040.2
- Performance: IEC/EN 62040-3 efficiency tested by an external independent body

**Product declaration:** C2, RCM (62376)

(1) @ 75% of rated load PF 0.7.

Control panel

1. Load present
2. Buzzer off
3. Load level (5 steps)
4. Battery status
5. Load status
6. Overload
7. Input value
8. Normal mode / Battery mode (flushing)
9. Configuration
10. Programmable outlets
11. OFF button
12. ON/TEST and buzzer override button
13. Battery fault / Replace the battery
14. General alarm
15. Navigator button

Standard electrical features
- Built-in backfeed protection.
- Protection against atmospheric phenomena (NTP) for telephone/ADSL modems.
- RJ11 connection for Emergency Power Off (EPO).
- Connection for battery extension modules.

Electrical options
- Battery extension modules.

Standard communication features
- LOCAL VIEW: ideal UPS monitoring and shutdown point-to-point solution for Windows®, Linux and Mac OS X® operating systems.
- HID: UPS management based on Windows® and Mac OS X® embedded service - USB interface.
- MODBUS RTU.

Communication options
- RT-VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.
Reliable and versatile power protection from 1 to 10 kVA

High protection and availability
- True online double conversion technology (VFI) assures high availability and total load protection.
- Constant output voltage and frequency regulation makes ITYS compatible with different applications, operating environments and generator sets.
- Automatic bypass supplies the loads in the event of overloads or faults.

Robust and versatile
- Compact tower UPS system saves space in the operating environment.
- No particular configuration on first startup.
- Easy connections via IEC 320 sockets or terminals.
- Wide input voltage tolerance limits the switchovers to battery mode prolonging the battery life.
- Manual bypass for periodic or emergency maintenance.

Wide battery configurability
- Flexible battery management available for all ITYS models to ensure power supply continuity in the event of an outage.
- Modular battery extension meets a wide variety of power back-up times according to the load to be supplied.
- Modular battery extension enables limitless increases in autonomy, even after installation.
- Powerful battery charger models guarantee constant and reliable operation using external high capacity batteries, therefore providing supply continuity during long outages.

The solution for
- Professional workstations
- Server and corporate networks
- Storage systems
- Industrial automation
- Security systems
- Telecom systems

Technology
- VFI “online double conversion”

Certifications
- RoHS compliant

Autonomy configurations (1/1 models)

Flexible autonomy
- UPS with internal batteries (standard model)

Extendable autonomy
- UPS without internal batteries and with powerful battery charger
- N+1 modular battery extension with 1 or 2 strings

Long autonomy
- UPS without internal batteries and with powerful battery charger
- External battery cabinet
**Robust and versatile power protection**

- High protection and availability
- Manual bypass for periodic or emergency events
- Wide input voltage tolerance limits the event of overloads or faults
- Easy connections via IEC 320 sockets or terminals
- No particular configuration on first startup.
- Automatic bypass supplies the loads in the operating environment.

**Technical data**

<table>
<thead>
<tr>
<th>Specification</th>
<th>ITYS 1 kVA</th>
<th>ITYS 2 kVA</th>
<th>ITYS 3 kVA</th>
<th>ITYS 6 - 10 kVA</th>
<th>ITYS 10 kVA - X/1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn</td>
<td>1000 VA</td>
<td>2000 VA</td>
<td>3000 VA</td>
<td>6000 VA</td>
<td>10000 VA</td>
</tr>
<tr>
<td>Ph</td>
<td>800 W</td>
<td>1600 W</td>
<td>2400 W</td>
<td>5400 W</td>
<td>9000 W</td>
</tr>
<tr>
<td>Input/output</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1 or 3/1</td>
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<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>230 V (110÷330 V)</td>
<td>230 V (110÷330 V)</td>
<td>400 V (330 V)</td>
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</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz ±10% (Auto-Selectable)</td>
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</tr>
<tr>
<td>Power factor</td>
<td>0.98</td>
<td>0.99</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>208 / 220 / 240 / 288 V ± 2 %</td>
<td>208 / 220 / 240 / 288 V ± 1 %</td>
<td>208 / 220 / 240 / 288 V ± 1 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload</td>
<td>Up to 150 % for 10 seconds</td>
<td>Up to 150 % for 1 minute</td>
<td>Up to 150 % for 10 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest factor</td>
<td>3:1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td>3 x IEC 320 (C13)</td>
<td>6 x IEC 320 (C13)</td>
<td>4 x IEC 320 (C13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BATTERIES</td>
<td>sealed lead-acid maintenance free - expected life 3/5 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>36 V DC</td>
<td>96 V DC</td>
<td>240 V DC</td>
<td>288 V DC</td>
<td></td>
</tr>
<tr>
<td>Back-up time(1)</td>
<td>10 min</td>
<td>17 min</td>
<td>9 min</td>
<td>9 min</td>
<td></td>
</tr>
<tr>
<td>Battery charger(2)</td>
<td>8 A</td>
<td>4 A</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>COMMUNICATION</td>
<td>RS232 - USB</td>
<td>RS232 - USB - Dry contact</td>
<td>RS232 - USB</td>
<td>NET VISION (TCP/IP &amp; SNMP) optional card</td>
<td></td>
</tr>
<tr>
<td>Local communication software</td>
<td>Local View</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EFFICIENCY</td>
<td>Online mode</td>
<td>up to 91 %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>up to 94%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td>Ambient service temperature</td>
<td>0 °C to +40 °C (15 °C to 25 °C for maximum battery lifetime)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relative humidity</td>
<td>&lt; 95 % non-condensing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum altitude</td>
<td>1000 m without de-rating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Noise level at 1 m</td>
<td>&lt; 50 dBA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UPS CABINET</td>
<td>Discharge W x D x H (mm)</td>
<td>145 x 400 x 220</td>
<td>192 x 400 x 347</td>
<td>265 x 550 x 708</td>
<td>350 x 650 x 890</td>
</tr>
<tr>
<td></td>
<td>Weight (models with internal batteries)</td>
<td>13 kg</td>
<td>31 kg</td>
<td>80 kg</td>
<td>84 kg</td>
</tr>
<tr>
<td></td>
<td>Weight (models without internal batteries)</td>
<td>7 kg</td>
<td>13 kg</td>
<td>25.5 kg</td>
<td>29.5 kg</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>FP30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Advanced communication**

- Wide range of communication protocols available as options (including JBUS, TCP/IP and SNMP) for integration into LAN networks or building management systems (BMS).
- RS232 advanced connection for the management of power supply and local/remote shutdown of the applications with Windows®, Linux and Mac OS X® systems.
- USB port for direct interfacing with Windows® and Mac OS X® systems.
- Clear and uncluttered LCD interface for easy UPS monitoring, even for less specialist users.

---

**Local and IP network management solutions**

- LOCAL VIEW: ideal point-to-point software for UPS monitoring and shutdown of Windows®, Linux and Mac OS X® operating systems (standard for all models).
- NET VISION: professional network adapter for monitoring and controlling UPS units from a remote location (option for all models).

---

(1) 975 % of rated load (models with internal batteries) PF 0.7
(2) Models without batteries
High protection and high availability
- The ITYS ES series is a range of compact UPS systems available in 1000, 2000 and 3000 VA models with on-line double conversion technology (VFI) with sinusoidal absorption.
- ITYS ES guarantees permanent regulation of the output voltage and frequency. This technology is compatible with all IT and industrial applications and operating environments, installations with generator sets included.
- Wide tolerance on input voltage ensures that switchovers to battery mode are infrequent, significantly prolonging battery lifetime.
- The automatic bypass device switches over in zero time in the event of overload or failure, guaranteeing uninterrupted services.

Straightforward to install and easy to use
- The UPS is shipped ready for connection with internal batteries connected and charged.
- ITYS ES, with the manual bypass option is easy to install without any special plant engineering preparation, as it is equipped with built-in thermal protection.
- The LCD monitoring/control panel and a buzzer make the equipment extremely easy and intuitive to use. The graphic indicating the power distribution path shows at a glance whether or not the system is working as it should.
- Battery efficiency can be tested via the control panel or using dedicated software.

Operating efficiency and versatility
- The versatility of these models makes them suitable for protecting critical devices in the industrial field.
- The standard equipment and communication accessories have been specially designed to satisfy the typical needs of installation or use in transformer cabins (i.e. tropicalized boards).
- In situations where automatic power management procedures are required, the communication software can be used to programme scheduled start-up and shutdown times.
- Restarting the UPS from the battery to power the DG before closing the main isolator.

The solution for
- Control devices
- Electric lines

Technology
- VFI "online double conversion"

Certifications

Tech info
The CEI 016 STANDARD for auxiliary cabin equipment requires an uninterrupted power supply to the control circuits for the General Protection and Medium Voltage Switch.
The control circuits for the General Protection, Medium Voltage Switch and col must be powered by the same auxiliary voltage when there is no power. The power supply must be guaranteed for a back-up time of 1 hour, either by the UPS or by buffer batteries.
The Medium Voltage Switch must be powered up by skilled personnel if out of service for a long time due to maintenance or failure.
It is necessary to power the General Protection before closing the Medium Voltage Switch.
The required protection comprises:
- Mains power cuts due to poor maintenance of the user’s system.
- Inappropriate tripping of the Medium Voltage Switch because of faults in the trip circuit.
- Alert signalling if the Medium Voltage Switch trips due to a power failure (system with regular maintenance).
The UPS is shipped ready for connection with internal batteries connected and charged. In situations where automatic power shutdown times, the power supply must be guaranteed for a back-up time of no power. The power supply must be simple to carry out, even in an emergency. Increased level of equipment immunity to surge voltages, typical for this type of application, thanks to suitable surge arrestors included in addition to standard UPS protection.

### UPS - Technical data

<table>
<thead>
<tr>
<th>ITYS ES</th>
<th>ITYS ES</th>
<th>ITYS ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn [VA]</td>
<td>1000</td>
<td>2000</td>
</tr>
<tr>
<td>Pn [W]</td>
<td>800</td>
<td>1600</td>
</tr>
</tbody>
</table>

#### INPUT
- **Rated voltage:** 230 V (110÷30V)
- **Rated frequency:** 50÷60 Hz
- **Power factor:** 0.98

#### OUTPUT
- **Rated voltage:** 208 / 220 / 230 / 240 V (± 2 %)
- **Rated frequency:** 50 / 60 Hz (45÷55 Hz / 54÷66 Hz)
- **Overload:** up to 150 % for 10 seconds
- **Crest factor:** 3.1
- **Wiring:** 3 x IEC 320 (C13) / 6 x IEC 320 (C13) / 4 x IEC 320 (C13) + terminals

#### BATTERIES
- **Type:** sealed lead-acid maintenance free - expected lifetime 3-5 years
- **Back-up time at 75% of the rated load:**
  - 10 minutes @ 50 W
  - 17 minutes @ 100 W
  - 9 minutes @ 150 W
- **Size for a back-up time of:**
  - 115 minutes @ 50 W
  - 154 minutes @ 100 W
  - 216 minutes @ 150 W
- **Back-up time** + switching back on:
  - 60 minutes @ 50 W
  - 60 minutes @ 100 W
  - 60 minutes @ 150 W

#### COMMUNICATION
- **Interfaces:** RS232 / USB
- **Ethernet adapter:** NET VISION (TCP / IP & SNMP) optional card
- **Local communication software:** Local View

#### EFFICIENCY
- **Online mode:** up to 92%

#### ENVIRONMENT
- **Ambient service temperature:** from 0 °C up to +40 °C (from 15 °C to 25 °C for maximum battery lifetime)
- **Relative humidity:** < 95 % non-condensing
- **Maximum altitude:** 1000 m without de-rating
- **Noise level at 1 m:** < 50 dBA

#### UPS
- **Dimensions W x D x H:** 145 x 400 x 220 mm / 192 x 480 x 347 mm
- **Weight:** 13 kg / 31 kg / 60 kg
- **Degree of protection:** IP20

#### COMPLIANCE WITH STANDARDS
- **Safety:** IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
- **EMC:** IEC/EN 62040-2, AS 62040.2
- **Product declaration:** CE, RCM (E2376)

#### Sn [VA]
- **1000**
- **2000**
- **3000**

#### INPUT
- **Type of terminals:** CED6
- **Wire size:** 6 mm² max

#### BYPASS
- **Switching positions:**
  - 1: UPS - 2: MAINS
- **Switching time:** 6 ms max

#### LOAD OUTPUT
- **Type of terminals:** CED6
- **Wire size:** 6 mm² max

#### UPS SUPPLY OUTPUT
- **Type of socket:** IEC 320 10 A / IEC 320 16 A

#### SURGE ARRESTORS (on request)
- **Type:** "L" in compliance with CEI EN 61643-11
- **L/N pulse current:** 40 kA (8/20) max
- **VAC/N:MODV:** 255 V max
- **VAC/LN:** 320 V max

---

### Standard communication features

- **LOCAL VIEW:** ideal UPS monitoring and shutdown point-to-point solution for Windows®, Linux and Mac OS® operating systems.
- **MODBUS/JBUS RTU (RS 232).**

### Communication options

- **NET VISION:** professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.
- **Dry contact interface.**

### Manual bypass (option)

- **Specially designed for ITYS ES, the manual bypass option enables:**
- **simplified installation:** connection to the system is made with industrial grade terminals, while connection to the UPS is via the pre-wired plug and socket supplied.
- **easy maintenance and uninterrupted operation:** thanks to the manual bypass isolator it is possible to service or replace the UPS while maintaining the power supply to the devices downstream in complete safety for the operator. This operation has been specially devised to be simple to carry out, even in an emergency.
- **increased level of equipment immunity to surge voltages,** typical for this type of application, thanks to suitable surge arrestors included in addition to standard UPS protection.

---

(1) @ 25 °C with charged battery.
(2) Factory setting: back-up time limited to 60 minutes to permit subsequent restarting with battery.
(3) Upon request.
MODULYS
Scalable and flexible modular solution from 1.5 to 24 kVA

Range description and features
Upgradable over time
• MODULYS adapts easily to changes and to the growth of your system. Power modules of 1.5, 3, 4.5 and 6 kVA, in tower, rack and system versions are easily combined to ensure the ideal configuration.

Total protection
• MODULYS is a modular UPS. The number of Mod-Power and Mod-Battery units can easily be increased to provide redundant operation, from N + 1 to N + X. In this way, total availability of the system is achieved, even if one or more modules are inoperative.

Continuous protection
• MODULYS has “hot swap” power and back-up modules which can be replaced or inserted while the system is in operation. In this way, true continuity of power supplied to the load is achieved, without any interruption of service.

Organisation of your future needs
• MODULYS modular design allows the number of modules to be increased and therefore, the power and back-up time of your UPS to grow. In this way you can easily cope with future situations which you are not able to predict today.

Working space
• MODULYS is the most compact UPS in its category. Whether in stand-alone version or one of the many system configurations, the installation takes up very little of your working area.

"No Single Point of Failure" solutions
• Each power module has its own integrated controller and an automatic bypass. In the system version, this design provides an additional guarantee since the load will be powered even if one of the modules is not working.

The solution for
> e.business
> Server farms
> Telecommunications
> Medical
> Computer networks

Technology
> VFI "online double conversion"
**Range**

- **Mod-RM** expandable from 1.5 to 9 kVA
- **Mod-MC** expandable from 1.5 to 24 kVA
- **Mod-EB** expandable from 9 to 24 kVA

---

### Standard electrical features

- Separate bypass input.
- 4 dry contacts relay card.

### Electrical options

- Temperature sensor.

---

### Technical data

#### Mod-Power

<table>
<thead>
<tr>
<th>Model</th>
<th>Battery pack</th>
<th>Sn (VA)</th>
<th>Pn (W)</th>
<th>Input/output</th>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mod-Power</td>
<td></td>
<td>1500</td>
<td>1050</td>
<td>1/1</td>
<td>230 V (1ph)</td>
<td>230 V (1ph + N) or 400 V (3ph + N)</td>
</tr>
<tr>
<td>RM 315</td>
<td>1</td>
<td>1500</td>
<td>1050</td>
<td>1/1/3</td>
<td>50/60 Hz</td>
<td>± 10%</td>
</tr>
<tr>
<td>RM 330</td>
<td>2</td>
<td>3000</td>
<td>2100</td>
<td>1/1/3</td>
<td>50/60 Hz</td>
<td>± 10%</td>
</tr>
<tr>
<td>MC 415</td>
<td>1</td>
<td>4500</td>
<td>3150</td>
<td>1/1/3</td>
<td>50/60 Hz</td>
<td>± 10%</td>
</tr>
<tr>
<td>MC 645</td>
<td>2</td>
<td>6000</td>
<td>4200</td>
<td>1/1/3</td>
<td>50/60 Hz</td>
<td>± 10%</td>
</tr>
</tbody>
</table>

**Input voltage**

- Rated voltage: 230 V (1ph) or 400 V (3ph)
- Voltage tolerance: ± 20% (up to -30% at 70% nominal load)
- Frequency tolerance: ± 10%
- Power factor: > 0.99

**Output voltage**

- Rated voltage: 230 V (1ph + N)
- Voltage tolerance: ± 3% (can be set 208/220/240 V)
- Frequency tolerance: ± 0.1% (autonomous frequency)
- Overload: 110% for 1 minute, 130% for 10 seconds, 200% for 5 cycles
- Crest factor: 3:1

**Bypass**

- Rated voltage: voltage selected
- Voltage tolerance: ± 15%
- Frequency tolerance: ± 2%

**Efficiency**

- Online mode: up to 91%
- Eco Mode: 97%

**Environment**

- Operating ambient temperature: 0 °C to + 40 °C (15 °C to 25 °C for best battery life)
- Relative humidity: 0% - 90% without condensation
- Maximum altitude (above sea level): 1000 m without de-rating (maximum 3000 m)

**Mod-System MODULYS MC**

<table>
<thead>
<tr>
<th>Model</th>
<th>battery</th>
<th>voltage range</th>
<th>maximum</th>
<th>standard but</th>
<th>maximum but @ 75% load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mod-MC 415</td>
<td>1.5</td>
<td>1000</td>
<td>1500</td>
<td>1000</td>
<td>1500</td>
</tr>
<tr>
<td>Mod-MC 430</td>
<td>3</td>
<td>2500</td>
<td>4500</td>
<td>2500</td>
<td>4500</td>
</tr>
<tr>
<td>Mod-MC 465</td>
<td>4.5</td>
<td>3000</td>
<td>6000</td>
<td>3000</td>
<td>6000</td>
</tr>
<tr>
<td>Mod-MC 660</td>
<td>6</td>
<td>5000</td>
<td>9000</td>
<td>5000</td>
<td>9000</td>
</tr>
</tbody>
</table>

**Mod-EB**

<table>
<thead>
<tr>
<th>UPS</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mod-EB 1290</td>
<td>9</td>
</tr>
<tr>
<td>Mod-EB 1212ss</td>
<td>12</td>
</tr>
</tbody>
</table>

**Mod-MC 912six**

<table>
<thead>
<tr>
<th>UPS</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mod-MC 912six</td>
<td>12</td>
</tr>
</tbody>
</table>

**Mod-RM**

<table>
<thead>
<tr>
<th>UPS</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mod-RM 12</td>
<td>5</td>
</tr>
</tbody>
</table>

---

### Standard communication features

- 2 slots for communication options.
- MODBUS/JBUS RTU (RS232).

### Communication options

- Dry-contact interface.
- Remote mimic panel.
- NET VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.

---

### An adaptable system

#### Mod-RM

<table>
<thead>
<tr>
<th>UPS</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mod-RM 12</td>
<td>5</td>
</tr>
</tbody>
</table>

#### Mod-MC

<table>
<thead>
<tr>
<th>UPS</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mod-MC 415</td>
<td>1.5</td>
</tr>
<tr>
<td>Mod-MC 430</td>
<td>3</td>
</tr>
<tr>
<td>Mod-MC 465</td>
<td>4.5</td>
</tr>
<tr>
<td>Mod-MC 660</td>
<td>6</td>
</tr>
<tr>
<td>Mod-MC 912six</td>
<td>12</td>
</tr>
</tbody>
</table>

---

### Standards

**Safety**

- IEC/EN 62040-1, AS 62040-1.1, AS 62040-1.2

**EMC**

- IEC/EN 62040-2, AS 62040.2

**Performance**

- IEC/EN 62040-3, AS 62040.3

**Product declaration**

- CE, RCM (E2376)
Compact, cost-effective protection

- Easy to order, install and operate.
- State-of-the-art technology providing high levels of performance in a very compact unit.
- Online double conversion mode with an output power factor of 0.9 providing 12% more active power compared to UPS with a power factor of 0.8.
- Best-in-class online efficiency.
- Innovative battery management extending battery life (virtually ZERO ripple on batteries).
- Redundant bypass protection reducing the risk of power cuts.

Tailored to your environment

- Designed to operate in challenging electrical environments.
- Ideal for protecting sensitive IT and non-IT applications.
- Flexible battery configurability without changing the footprint.
- Internal isolation transformer (on request).
- Low electromagnetic emissions compliant for commercial installations.

The solution for

- Server rooms
- Service sector
- Infrastructure
- Healthcare sector
- Light industrial applications

Technology

- VFI "online double conversion"

Advantages

- 95% efficiency
- PF 0.9

Certifications

- RoHS compliant

UPS configurations

- UPS - Type S
  - Without batteries
- UPS - Type M
  - With batteries
- UPS - Type T
  - With batteries
**Standard electrical features**

- Internal maintenance bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.

**Standard communication features**

- User-friendly multilingual interface with graphic display.
- Integrated LAN network monitoring via web browser.
- 2 slots for communication options.

**Communication options**

- Dry-contact interface.
- MODBUS interface.

---

**Technical data**

<table>
<thead>
<tr>
<th>UPS with internal batteries</th>
<th>Back-up time (minutes)[7]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type M</strong></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10 20 30 40 50 60</td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td><strong>Type T</strong></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10 20 30 40 50 60</td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

---

**Remote monitoring service**

- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.

---

**Local and IP network management solutions**

- LOCAL VIEW: ideal point-to-point software for UPS monitoring and shutdown of Windows®, Linux and MAC OS X® operating systems.
- NET VISION: professional network adapter for monitoring and controlling UPS units from a remote location (option for all models).

---

**Rear view connections**

1. EPO (Emergency Power Off)
2. Ethernet port
3. RS232 serial port
4. Slot for optional communication boards
5. Mains, auxiliary mains, output and manual bypass protective devices
6. Input, output and external battery terminal board
7. Battery protection (M and T models)
8. Castor wheel with security lock

---

**General Catalogue 2018-2019**

43
A complete, cost-effective solution
• Online double conversion mode with an output power factor of 0.9 providing 12% more active power compare to UPS with a power factor of 0.8.
• Dual input mains allows you to manage independent power sources.
• Increased system availability placing two UPS in parallel for 1+1 redundancy.
• Internal manual bypass for easy maintenance without power interruption.
• Internal batteries providing more than 1 hour runtime.
• Multilanguage display.

Tailored to your environment
• Saves space with a reduced footprint and optimized cabinet size.
• Low noise level.
• Flexible battery solutions
• Compact, lightweight and easy to install.
• Extended battery life and performance with exclusive EBS battery charging management for increased battery life.

The solution for
> Server rooms
> Service sector
> Infrastructure
> Healthcare sector
> Light industrial applications

Technology
> VFI “online double conversion”

Certifications
The MASTERYS BC series is certified by TÜV SÜD with regard to product safety (EN-62040-1).

Our dedicated Expert Services for UPS
We offer services to ensure your UPS highest availability:
> Commissioning
> On-site intervention
> Preventive maintenance visits
> 24-hour call out and rapid on-site repairs
> Maintenance packages
> Training

www.socomec.com/services
Standard electrical features
- Dual input mains (15-40 kVA).
- Internal manual bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.

Electrical options
- Dual input mains (60-80 kVA).
- External battery cabinet.
- External temperature sensor.
- Additional battery chargers.
- Galvanic isolation transformer.
- Parallel kit.
- ACS synchronization system.

Standard communication features
- MODBUS RTU.
- 2 slots for communication options.

Communication options
- Dry-contact interface.
- PROFIBUS.
- NET VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.

Remote monitoring service
- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.

Technical data

<table>
<thead>
<tr>
<th>MASTEY BC</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn [kVA]</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Pn [kW]</td>
<td>13.5</td>
<td>18</td>
</tr>
<tr>
<td>Input/output 3/1</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Input/output 3/3</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Parallel configuration</td>
<td>1+1</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>400 V 3ph + N</td>
<td></td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>240 V to 480 V²</td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz ± 10%</td>
<td></td>
</tr>
<tr>
<td>Power factor / THDI</td>
<td>0.99 / &lt; 3%</td>
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</tbody>
</table>

UPS and internal batteries

<table>
<thead>
<tr>
<th>UPS</th>
<th>In/Out</th>
<th>kVA</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
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</thead>
<tbody>
<tr>
<td>BC 115</td>
<td>3/1</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>BC 120</td>
<td>3/1</td>
<td>20</td>
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</tr>
<tr>
<td>BC 315</td>
<td>3/3</td>
<td>15</td>
<td></td>
<td></td>
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<tr>
<td>BC 320</td>
<td>3/3</td>
<td>20</td>
<td></td>
<td></td>
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<tr>
<td>BC 330</td>
<td>3/3</td>
<td>30</td>
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<tr>
<td>BC 340</td>
<td>3/3</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) Max BUT @ 70% load
(2) Condition apply.
(3) Without batteries.

(1) The standard model is prepared for a 1+1 redundant system. Upon request, it is possible to have connected up to 6 modules in a parallel system. (2) Conditions apply. (3) Without batteries.
MASTERYS BC+
4th generation digital native general purpose UPS
from 100 to 160 kVA

The best protection with a cost-effective approach
- Online double conversion mode with an output power factor of 0.9.
- Best-in-class online efficiency.
- Versatile to operate in different electrical environments.
- Standard design with dual input mains to manage independent power sources.
- Standard design equipped with input, output and auxiliary mains switches.
- Internal manual bypass for easy maintenance with no power interruption.

Easy to integrate and user-friendly
- Compact, lightweight and easy to install.
- Low acoustic noise level.
- Modern aesthetics combined with ergonomics.
- User-friendly multilingual interface with a graphic LCD display.

Extremely reliable, robust and durable
- Completely designed and manufactured in Europe.
- Certified seismic resistance.

Tailor-made - as standard
- Easy configurable for retrofit in existing installations.
- Catalogue base flexibility to meet specific needs.
- Fast delivery time for a fully personalized solution.

Native digital solution
- Ready for integration in LAN and Industry 4.0 ecosystem.
- IoT ready and remote cloud services.
- Multiprocessor intelligent product architecture.
- Product identification and configuration using standard QR codes.

The solution for
Commercial buildings
- Security control
- Payment systems
- Emergency services
- IT networking
- Building automation
Smart manufacturing
- Process control systems
- Cloud service access

Certifications
- The MASTERYS BC+ series is certified by TÜV SÜD with regard to product safety (EN 62040-1).
- Seismic resistant: The MASTERYS BC+ units have successfully passed severe tests to verify resistance to withstand Zone 4 seismic events.

Advantages
- 95% Efficiency
- PF 0.9
- RoHS Compliant

A tutoring app for a simplified installation
- Augmented Reality technology
- Guided workflow on your smartphone
- Verification and validation by the Socomec Service Center
**System features**

- Dual input mains.
- Internal maintenance bypass switch.
- Input mains switch breaker.
- Output switch breaker.
- Auxiliary mains switch breaker.
- Backfeed protection: detection circuit.
- Power walk-in ramp for excellent compliance with generators.

**Standard communication features**

- Graphical LCD multilingual display.
- 2 slots for communication options.
- USB port to download log file.
- Ethernet port for service purposes.

**Technical data**

<table>
<thead>
<tr>
<th>Feature</th>
<th>MASTERYS BC+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn [kVA]</td>
<td>100 120 160</td>
</tr>
<tr>
<td>Pn [kW]</td>
<td>90 108 144</td>
</tr>
<tr>
<td>Input/output</td>
<td>3/3</td>
</tr>
<tr>
<td>Parallel configuration</td>
<td>up to 6 units</td>
</tr>
<tr>
<td>INPUT</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>400 V 3ph+N (3 wire input also available on demand)</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>240 V to 430 V</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz ± 10%</td>
</tr>
<tr>
<td>OUTPUT</td>
<td></td>
</tr>
<tr>
<td>Power factor</td>
<td>0.9 (according to IEC/EN 62040-3)</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>3ph + N: 400 V (can be configured 380/415 V)</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>± 2% (configurable with GenSet compatibility)</td>
</tr>
<tr>
<td>Total output voltage distortion</td>
<td>&lt; 1%</td>
</tr>
<tr>
<td>Overload</td>
<td>125% for 10 minutes, 150% for 1 minute</td>
</tr>
<tr>
<td>Crest factor</td>
<td>3:1</td>
</tr>
<tr>
<td>BYPASS</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>rated output voltage</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 15% (configurable with from 10% to 20%)</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>± 2%</td>
</tr>
<tr>
<td>EFFICIENCY</td>
<td></td>
</tr>
<tr>
<td>Double conversion mode</td>
<td>up to 98%</td>
</tr>
<tr>
<td>Always on mode</td>
<td>up to 99%</td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td></td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>from 0 °C to +35 °C (from 15 °C to 25 °C for maximum battery life)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>0% - 95% without condensation</td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>1000 m without derating (max. 3000 m)</td>
</tr>
<tr>
<td>Acoustic level at 1 m (ISO 3746)</td>
<td>&lt; 60 dBA</td>
</tr>
<tr>
<td>UPS CABINET</td>
<td>&lt; 65 dBA</td>
</tr>
<tr>
<td>Dimensions</td>
<td>W 600 mm</td>
</tr>
<tr>
<td></td>
<td>D 855 mm</td>
</tr>
<tr>
<td></td>
<td>H 1400 mm 1930 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>220 kg 232 kg 340 kg</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
</tr>
<tr>
<td>Colour</td>
<td>Metalised Grey E150HV</td>
</tr>
<tr>
<td>STANDARDS</td>
<td></td>
</tr>
<tr>
<td>Safety EMC</td>
<td>IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2</td>
</tr>
<tr>
<td>Performance</td>
<td>IEC/EN 62040-3, AS 62040.3</td>
</tr>
<tr>
<td>Environmental</td>
<td>full compliance with the RoHS EU directive</td>
</tr>
<tr>
<td>Seismic compliance</td>
<td>on demand, in accordance with the Uniform Building Code UBC-1997 Zone 4</td>
</tr>
<tr>
<td>Product declaration</td>
<td>CE, RCM (E2376)</td>
</tr>
</tbody>
</table>

**System options**

- External battery cabinet with normal or long-life VRLA batteries.
- High capacity battery charger.
- Alternative backup power technologies: - NiCd batteries
  - Li-Ion batteries
  - Li-Ion capacitors
- 3-phase input without neutral.
- Internal backfeed isolation device.
- Common mains coupling bars.
- TN-C grounding system.
- ACS synchronisation system.
- IP21 degree of protection.
- Top cabling kit.
- Top ventilation kit.
- Bypass redundant cooling.
- Seismic fixing kit.

**Communication options**

- Dry-contact, RS232/485 interfaces.
- MODBUS RTU.
- MODBUS TCP.
- BACnet/IP interface.
- NET VISION: professional WEB/SNMP, ethernet interface for UPS monitoring and remote automatic shutdown.
- Ethernet gateway for cloud services.

**Remote monitoring service**

- LINK-UPS, remote monitoring service which connects your UPS to your Critical Power specialist 24/7.

**Our dedicated Expert Services for UPS**

We offer services to ensure your UPS highest availability:

- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services
DELPHYS BC
Reliable, simple and ready-to-use power protection from 200 to 300 kVA

The solution for

> Server rooms
> Service sector
> Infrastructure
> Healthcare sector
> Light industrial applications

Our dedicated Expert Services for UPS

We offer services to ensure your UPS highest availability:

> Commissioning
> On-site intervention
> Preventive maintenance visits
> 24-hour call out and rapid on-site repairs
> Maintenance packages
> Training

www.socomec.com/services

A complete, cost-effective solution

- Online double conversion mode with an output power factor of 0.9 providing 12% more active power compared to UPS with a power factor of 0.8.
- Dual input mains allows you to manage independent power sources.
- Increased system availability placing two UPS in parallel for 1+1 redundancy.
- Internal manual bypass for easy maintenance without power interruption (1+1 configuration).
- Multilanguage display.

Tailored to your environment

- Saves space with a reduced footprint and optimized cabinet size.
- Low noise level.
- Compact, lightweight and easy to install.
- No neutral required on rectifier input.
- Two-wire battery connection (only ±/−).
- Extended battery life and performance with exclusive EBS battery charging management for increased battery life.

Technical data

Sn [kVA] 200 300
Pn [kW] 180 270
Parallel configuration up to 6 units

INPUT
Rated voltage 400 V 3ph
Voltage tolerance 240 V to 480 V (1)
Rated frequency 50 / 60 Hz ± 10%
Power factor / THDI 0.99 / < 3%

OUTPUT
Rated voltage 400 V
Voltage tolerance static load ±1%
dynamic load in accordance with VFI-SS-111
Rated frequency 50 / 60 Hz
Frequency tolerance ± 2% (configurable from 1% to 8%)
Crest factor 3:1

BYPASS
Rated voltage rated output voltage
Voltage tolerance ± 15% (configurable from 10% to 20%)
Rated frequency 50 / 60 Hz
Frequency tolerance ± 2% (configurable for Genset compatibility)

EFFICIENCY
Online mode @ 100% of load up to 95%

ENVIRONMENT
Operating ambient temperature from 0 °C up to +40(2) °C (from 15 °C to 25 °C for maximum battery life)
Relative humidity 0% - 95% without condensation
Maximum altitude 1000 m without derating (max. 3000 m)
Acoustic level at 1 m (ISO 3746) < 68 dBA < 71 dBA

UPS CABINET
Dimensions W x D x H 700 x 800 x 1930 mm 1000 x 950 x 1930 mm
Weight 500 kg 830 kg
Degree of protection IP20
Colours RAL 7012, silver grey frontal door

STANDARDS
Safety
IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
EMC
IEC/EN 62040-2, AS 62040.2
Performance
IEC/EN 62040-3, AS 62040.3
Product declaration CE, RCM (E2376)

(1) Conditions apply.

Standard electrical features

- Dual input mains.
- Integrated maintenance bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.

Electrical options

- External battery cabinet.
- External temperature sensor.
- Additional battery chargers.
- Shared battery.
- Galvanic isolation transformer.
- Parallel kit.
- ACS synchronization system.

Standard communication features

- 2 slots for communication options.

Communication options

- ADC interface (configurable voltage-free contacts).
- MODBUS TCP.
- MODBUS RTU.
- PROFIBUS.
- NET VISION: professional WEB / SNMP interface for UPS monitoring and shutdown management of several operating systems.

Remote monitoring service

- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.
## Standard electrical features
- Dual input mains.
- Integrated maintenance bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.

## Electrical options
- External battery cabinet.
- External temperature sensor.
- Additional battery chargers.
- Shared battery.
- Galvanic isolation transformer.
- Parallel kit.
- ACS synchronization system.

## Technical data

<table>
<thead>
<tr>
<th></th>
<th>DELPHYS BC</th>
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<tbody>
<tr>
<td>Sn [kVA]</td>
<td>200</td>
</tr>
<tr>
<td>Pn [kW]</td>
<td>180</td>
</tr>
<tr>
<td>Sn [kVA]</td>
<td>300</td>
</tr>
<tr>
<td>Pn [kW]</td>
<td>270</td>
</tr>
<tr>
<td>Parallel configuration</td>
<td>up to 6 units</td>
</tr>
</tbody>
</table>

### INPUT
- Rated voltage: 400 V 3ph
- Voltage tolerance: 240 V to 480 V(1)
- Rated frequency: 50 / 60 Hz ± 10%
- Power factor/THDI: 0.99/ < 3%

### OUTPUT
- Rated voltage: 400 V
- Voltage tolerance: static load ±1% dynamic load in accordance with VFI-SS-111
- Rated frequency: 50 / 60 Hz
- Frequency tolerance: ± 2% (configurable from 1% to 8%)
- Crest factor: 3:1

### BYPASS
- Rated voltage: rated output voltage
- Voltage tolerance: ± 15% (configurable with from 10% to 20%)
- Rated frequency: 50 / 60 Hz
- Frequency tolerance: ± 2% (configurable for Genset compatibility)

### EFFICIENCY
- Online mode @ 100% of load: up to 95%

### ENVIRONMENT
- Operating ambient temperature: from 0 °C up to +40° C (from 15 °C to 25 °C for maximum battery life)
- Relative humidity: 0 % - 95 % without condensation
- Maximum altitude: 1000 m without derating (max. 3000 m)
- Acoustic level at 1 m (ISO 3746): < 68 dBA < 71 dBA

### UPS CABINET
- Dimensions W x D x H: 700 x 800 x 1930 mm
- Weight: 500 kg
- 830 kg

### STANDARDS
- Safety: IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
- EMC: IEC/EN 62040-2, AS 62040.2
- Performance: IEC/EN 62040-3, AS 62040.3
- Product declaration: CE, RCM (E2376)

---

(1) Conditions apply.
Energy saving + Full rated power = reduced TCO

Energy Saving: high efficiency without compromise

- Offers the highest efficiency in the market using VFI – Double Conversion Mode, the only UPS working-mode that assures total load protection against all mains quality problems.
- Ultra high efficiency output independently tested and verified by an international certification organization in a wide range of load and voltage operating conditions, to have the value in the real site conditions.
- Ultra high efficiency in VFI mode is provided by an innovative topology (3-Level technology) that has been developed for all the Green Power 2.0 UPS ranges.

Full-rated power: kW=kVA

- No power downgrading when supplying the latest generation of servers (leading or unity power factor).
- Real full power, according to IEC 62040: kW=kVA (unity power factor design) means 25% more active power available compared to legacy UPS.
- Suitable also for leading power factor loads down to 0.9 without apparent power derating.

Significant cost-saving (TCO)

- Maximum energy saving thanks to 96% efficiency in true double conversion mode: 50% saving on energy losses compared to legacy UPS gives significant savings in energy bill.
- UPS “self-paying” with energy saving.
- Energy Saver mode for global efficiency improvement on parallel systems.
- kW=kVA means maximum power available with the same UPS rating: no overdesign cost and therefore less €/kW.
- Upstream infrastructure cost optimization (sources and distribution), thanks to high performance IGBT rectifier.
- Battery configuration can be optimized, thanks to a very wide DC range.
- Extended battery life and performance: - long life battery, - very wide input voltage and frequency acceptance, without battery use.
- EBS (Expert Battery System) charging management improves battery service life.

The solution for

- Data centres
- Telecommunications
- Healthcare sector
- Service sector
- Infrastructure
- Industrial applications

Certifications

- The MASTERYS GP series is certified by TÜV SÜD with regard to product safety (EN 62040-1).

Advantages

- Our dedicated Expert Services for UPS

We offer services to ensure your UPS highest availability:
- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services
Green Power 2.0 range from 10 to 40 kVA/kW

**Standard electrical features**
- Dual input mains.
- Internal maintenance bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.
- Battery temperature sensor.

**Electrical options**
- External maintenance bypass.
- External battery cabinet.
- Additional battery chargers.
- Galvanic isolation transformer.
- Parallel kit.
- ACS synchronization system.

**Technical data**

<table>
<thead>
<tr>
<th><strong>Masterys GP</strong></th>
<th>Sn [kVA]</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>40</th>
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<tbody>
<tr>
<td>Ph [kW]</td>
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<td>15</td>
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<td>Parallel configuration up to 6 units</td>
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<tr>
<td><strong>Input</strong></td>
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</tr>
<tr>
<td>Rated voltage</td>
<td>400 V 3ph+N</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>240 V to 480 V</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz ± 10%</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power factor / THDI</td>
<td>&gt; 0.99 &lt; 2.5%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Output</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power factor</td>
<td>1 (according to IEC/EN 62040-3)</td>
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<td></td>
<td></td>
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<tr>
<td>Rated voltage</td>
<td>1ph + N: 230 V (can be configured 220/240 V)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>static load ±1 % dynamic load in accordance with VFI-SS-111</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>± 2% (configurable for GenSet compatibility)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total output voltage distortion - linear load</td>
<td>&lt; 1%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total output voltage distortion - non-linear load</td>
<td>&lt; 3%</td>
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<td>Overload</td>
<td>125% for 10 minutes, 150% for 1 minute(1)</td>
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<td>Crest factor</td>
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<tr>
<td><strong>Bypass</strong></td>
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</tr>
<tr>
<td>Rated voltage</td>
<td>rated output voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 15% (configurable from 10% to 20%)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>± 2%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Efficiency (TÜV SÜD verified)</strong></td>
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</tr>
<tr>
<td>Online mode @ 50% of load</td>
<td>up to 96%</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online mode @ 75% of load</td>
<td>up to 96%</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Online mode @ 100% of load</td>
<td>up to 96%</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Eco Mode</td>
<td>up to 96%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>from 0 °C up to +40 °C (from 15 °C to 25 °C for maximum battery life)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>0% - 95% without condensation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>1000 m without derating (max. 3000 m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acoustic level at 1 m [ISO 3746]</td>
<td>&lt; 52 dBA</td>
<td>&lt; 55 dBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**UPS cabinet**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>W</th>
<th>H</th>
<th>Weight</th>
<th>Degree of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>444 mm</td>
<td>800 mm</td>
<td>190 kg</td>
<td>IP20</td>
</tr>
<tr>
<td></td>
<td>795 mm</td>
<td>1000 mm</td>
<td>195 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1400 mm</td>
<td>1400 mm</td>
<td>315 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>320 kg</td>
<td></td>
</tr>
</tbody>
</table>

**Standards**

- **Safety**: IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
- **EMC**: IEC/EN 62040-2, AS 62040.2
- **Performance**: IEC/EN 62040-3, AS 62040.3
- **Seismic compliance**: On demand according to Uniform Building Code UBC-1997 Zone 4
- **Product declaration**: CE, RCM (E23796)

(1) Conditions apply.

**Communication options**

- Dry-contact interface.
- PROFIBUS.
- BACnet/IP interface.
- NET VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.

**Remote monitoring service**

- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.
MASTERYS GP4

4th generation digital native high performance UPS from 60 to 160 kVA/kW

Performance beyond all expectations
- Performance certified by an independent body.
- Designed to manage Lithium backup storage.
- Modern aesthetics combined with ergonomics.
- Large 7” touch screen display facilitates system control and usage.

Energy Saving: high efficiency without compromise
- Offers the highest efficiency on the market using a VFI – Double Conversion Mode, the only UPS working mode to ensure a total load protection from any mains quality issues.
- No overdesign cost thanks to its reduced €/kW ratio.

Full-rated power: kW=kVA
- No power downgrade when supplying the latest generation of servers (leading or unity power factor).
- True full active power, according to IEC 62040
- Full performance up to 40 °C without derating.

Extremely reliable, robust and durable
- Completely designed and manufactured in Europe.
- Best in class and officially attested:
  - MTBF<sub>VR</sub> = 300,000 hours.
  - MTBF<sub>UFE</sub> = 10,000,000 hours.
- Certified seismic resistance.
- Life extension service program doubles life expectancy.

Tailor-made - as standard
- Easy configurable for retrofit in existing installations.
- Catalogue base flexibility to meet specific needs.
- Fast delivery time for a fully personalized solution.

Native digital solution
- Ready for integration in LAN and Industry 4.0 ecosystem.
- IoT ready and remote cloud services.
- Multiprocessor intelligent product architecture.
- Product identification and configuration using standard QR codes.

The solution for
Mission Critical
- Small and medium data centres
- IT infrastructure
- E-Medical
- Medical devices
- Control rooms
Smart manufacturing
- Edge computing
- IoT systems
- Cloud service access

Certifications
Seismic resistant: The MASTERYS GP4 units have successfully passed severe tests to verify their resistance to withstand Zone 4 seismic events.

Advantages

A tutoring app for a simplified installation
- Augmented Reality technology
- Guided workflow on your smartphone
- Verification and validation by the Socomec Service Center

Technical data

<table>
<thead>
<tr>
<th>Sn [kVA]</th>
<th>60</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>160</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>174 kg</td>
<td>186 kg</td>
<td>228 kg</td>
<td>240 kg</td>
<td>350 kg</td>
</tr>
</tbody>
</table>

System options
- Link-UPS, remote monitoring service which connects your UPS to your Critical Power
- Ethernet gateway for cloud services.
- NET VISION: professional WEB/SNMP, BACnet/IP interface.
- MODBUS TCP.
- MODBUS RTU.
- Dry-contact, RS232/485 interfaces.
- Seismic fixing kit.
- Bypass redundant cooling.
- Top cabling kit.
- ACS synchronisation system.
- High capacity battery charger.
- External battery cabinet with normal or long-life VRLA batteries.

Maintenance packages
- 24-hour call out and rapid on-site repairs
- Preventive maintenance visits
- On-site intervention
- Commissioning
- On-site repairs
- 3 level service.

www.socomec.com/services
**System features**
- Dual input mains.
- Internal maintenance bypass switch.
- Input mains switch breaker.
- Output switch breaker.
- Auxiliary mains switch breaker.
- Backfeed protection: detection circuit.
- Power walk-in ramp for excellent compliance with generators.
- Common or shared battery for N+1 configuration.

**Standard communication features**
- 7” touch screen multilingual colour graphic display.
- 2 slots for communication options.
- USB port to download log file.
- Ethernet port for service purposes.

**Technical data**

<table>
<thead>
<tr>
<th><strong>Sn [kVA]</strong></th>
<th>60</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>160</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pn [kW]</strong></td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>160</td>
</tr>
<tr>
<td><strong>Input/output 3/3</strong></td>
<td>3/3</td>
<td>3/3</td>
<td>3/3</td>
<td>3/3</td>
<td>3/3</td>
</tr>
<tr>
<td><strong>Parallel configuration</strong></td>
<td>up to 6 units</td>
<td>up to 6 units</td>
<td>up to 6 units</td>
<td>up to 6 units</td>
<td>up to 6 units</td>
</tr>
</tbody>
</table>

**INPUT**
- **Rated voltage**: 400 V 3ph+N (3 wire input also available on demand)
- **Voltage tolerance**: ±15% (configurable from 10% to 20%)
- **Rated frequency**: 50/60 Hz ± 10%
- **Frequency tolerance**: ± 2% (configurable for GenSet compatibility)
- **Total output voltage distortion**: < 1%
- **Overload**: 125% for 10 minutes, 150% for 1 minute
- **Crest factor**: 3:1

**OUTPUT**
- **Power factor**: 1 (according to IEC/EN 62040-3)
- **Rated voltage**: 3ph + N 400 V (can be configured 380/415 V)
- **Rated frequency**: 50/60 Hz
- **Frequency tolerance**: ± 2%
- **Voltage tolerance**: ± 15% (configurable from 10% to 20%)
- **Rated frequency**: 50/60 Hz
- **Frequency tolerance**: ± 2%
- **Rated voltage**: 400 V (can be configured 380/415 V)
- **Rated voltage**: 3ph + N: 400 V (can be configured 380/415 V)
- **Rated frequency**: 50/60 Hz ± 10%
- **Rated frequency**: 50/60 Hz

**EFFICIENCY (TÜV SÜD verified)**
- **Double conversion mode**: up to 96.5%
- **Always on mode**: up to 99%

**ENVIRONMENT**
- **Operating ambient temperature**: from 0 °C to +40 °C (from 15 °C to 25 °C for maximum battery life)
- **Relative humidity**: 0% - 95% without condensation
- **Maximum altitude**: 1000 m without derating (max. 3000 m)
- **Acoustic level at 1 m (ISO 3746)**: < 55 dBA
- **UPS CABINET**
- **Dimensions**:
  - W: 600 mm
  - D: 855 mm
  - H: 1400 mm
  - 1930 mm
- **Weight**:
  - 174 kg
  - 186 kg
  - 228 kg
  - 240 kg
  - 350 kg
- **Degree of protection**: IP20
- **Colours**: RAL 7016

**STANDARDS**
- **Safety EMC**: IEC/EN 62040-1, A5 62040.1.1, A5 62040.1.2
- **Environmental**: full compliance with the RoHS EU directive
- **Seismic resistent**: withstand Zone 4 seismic events
- **IP21 degree of protection**
- **Service Center**

**System options**
- **External battery cabinet with normal or long-life VRLA batteries**
- **High capacity battery charger**
- **Alternative backup power technologies**:
  - NiCd batteries
  - Li-Ion batteries
  - Li-Ion capacitors
  - 3-phase input without neutral
- **Internal backfeed isolation device**
- **Common mains coupling bars**
- **TN-C grounding system**
- **ACS synchronisation system**
- **IP21 degree of protection**
- **Top cabling kit**
- **Top ventilation kit**
- **Bypass redundant cooling**
- **Seismic fixing kit**

**Communication options**
- **Dry-contact, RS232/485 interfaces**
- **MODBUS RTU**
- **MODBUS TCP**
- **BACnet/IP interface**
- **NET VISION: professional WEB/SNMP, ethernet interface for UPS monitoring and remote automatic shutdown**
- **Ethernet gateway for cloud services**

**Remote monitoring service**
- **LINK-UPS, remote monitoring service which connects your UPS to your Critical Power specialist 24/7.**

**Our dedicated Expert Services for UPS**
We offer services to ensure your UPS highest availability:
- **Commissioning**
- **On-site intervention**
- **Preventive maintenance visits**
- **24-hour call out and rapid on-site repairs**
- **Maintenance packages**
- **Training**

**Technical data**

<table>
<thead>
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<th><strong>Pn [kW]</strong></th>
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- **Maintenance packages**
- **Training**
**DELPHYS GP**

High-efficiency protection without compromise

*Green Power 2.0* range from 160 to 1000 kVA/kW

---

### Energy saving + Full rated power = reduced TCO

**Energy saving: high efficiency without compromise**
- Offers the highest efficiency in the market using VFI – Double Conversion Mode, the only UPS working-mode that assures total load protection against all mains quality problems.
- Ultra high efficiency output independently tested and verified by an international certification organization in a wide range of load and voltage operating condition.
- Ultra high efficiency in VFI mode is provided by an innovative topology (3-Level technology) that has been developed for all the Green Power 2.0 UPS ranges.

**Full rated power: kW=kVA**
- No power downgrading when supplying the latest generation of servers (leading or unity power factor).
- Real full power, according to IEC 62040: kW=kVA (unity power factor design) means 25% more active power available compared to legacy UPS.
- Suitable also for leading power factor loads down to 0.9 without apparent power derating.

**Significant cost-saving (TCO)**
- Maximum energy saving thanks to 96% efficiency in true double conversion mode: 50% saving on energy losses compared to legacy UPS gives significant savings in energy bill.
- Up to 99% efficiency with FAST ECoMoDE.
- UPS “self-paying” with energy saving.
- Energy Saver mode for global efficiency improvement on parallel systems.
- kVA=kVA means maximum power available with the same UPS rating: no overdesign cost and therefore less €/kW.
- Upstream infrastructure cost optimization (sources and distribution), thanks to high performance IGBT rectifier.
- Extended battery life and performance:
  - long life battery,
  - very wide input voltage and frequency acceptance, without battery use.
- EBS (Expert Battery System) charging management improves battery service life.
- BCR (Battery Capacity Re-injection) removes the constraints of using an additional load bank for the battery discharge test: it consists in re-injecting the energy stored in the batteries to other applications.
Parallel systems

To fulfill the most demanding needs for power supply availability, flexibility and the installation to be upgraded.

- Modular parallel configurations up to 4 MW, development without constraint.
- Distributed or centralized bypass flexibility to ensure a perfect compatibility with the electrical infrastructure.
- Twin channel architecture with Static Transfer Systems.
- Distributed or shared battery for energy storage optimization on parallel systems.

Standard electrical features

- Integrated maintenance bypass for single unit (and 1+1 system).
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.
- Redundant cooling.
- Battery temperature sensor.

Technical data

<table>
<thead>
<tr>
<th>Sn [kVA]</th>
<th>160</th>
<th>200</th>
<th>250</th>
<th>320</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>800</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn [kW]</td>
<td>160</td>
<td>200</td>
<td>250</td>
<td>320</td>
<td>400</td>
<td>500</td>
<td>600</td>
<td>800</td>
<td>1000</td>
</tr>
<tr>
<td>Parallel configuration</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
</tr>
</tbody>
</table>

Electrical options

- Separated or common input mains.
- External maintenance bypass.
- Extended battery charger capability.
- Shared battery.
- Compatible with different battery technologies (e.g. Li-Ion, Ni-Cd...).
- Galvanic isolation transformer.
- Backfeed isolation device.
- ACS synchronisation system.
- BCR (Battery Capacity Re-injection).
- FAST ECOMODE.

Standard communication features

- User-friendly multilingual interface with graphic display.
- 2 slots for communication options.
- Ethernet connection (WEB/SNMP/email).
- USB port for event log access.

Communication options

- Advanced server shutdown options for stand-alone and virtual servers.
- 4 additional slots for communication options.
- ADC interface (configurable voltage-free contacts).
- MODBUS TCP.
- MODBUS RTU.
- BACnet/IP interface.

Remote monitoring service

- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.

---

1. Conditions apply.
2. Worst condition (Auxiliary Mains not available).
3. With input THD < 1%.
4. 160, 200 and 500 MVA/W models.
DELPHYS XTEND GP combines all the benefits of the Green Power 2.0 technology and the flexibility of a modular system and provides easy adaptation to evolving requirements, without impacting the surrounding electrical infrastructure. DELPHYS XTEND GP is a real scalable UPS system designed to provide power scalability that can be built up with power blocks to extend the system according to the maximum power requirement.

DELPHYS XTEND GP power scalability is provided by Xmodule power blocks docked onto prewired Xbay docks. The installation and the positioning are easy with secured operation both for operators and the application. During system extensions or maintenance, the load is fully protected in online double conversion mode.

Real hot-scalable solution

- Reliable power that can be increased when needed.
- Load fully protected in VFI mode during system extensions and maintenance.
- Prewired system providing quick and safe power scalability.

Total system adaptability

- Many disposition possibilities.
- Distributed or centralised static bypass.
- Shared or distributed batteries.
- AC and DC power connections flexibility.

Optimized capital employed

- Lower initial and operating costs.
- No modification to the site’s electrical infrastructure during power upgrading.
- Optimized maintenance expenditure.
- BCR (Battery Capacity Re-injection), innovative battery discharge test.

Full set of services

- Preventive maintenance.
- 24 / 7 Hot-Line and remote monitoring.
- Quick response time to site and availability of new modules.
- Cabling & docking.
- OPEX-based costing models.

The solution for

- Large data centers
- Telecommunications
- Healthcare sector
- Service sector
- Infrastructure
- Processes
- Industrial applications

Attestations and certifications

- DELPHYS XTEND GP Xmodule power blocks are attested by Bureau Veritas.
- Three-phase UPS
- Energy performance
- Made in Europe

Advantages

- High efficiency
- Battery capacity re-injection
- Made in Europe

Xmodule - designed to save costs

- Energy performance
  Based on DELPHYS GP 200 kW, the system has all the advantages of the Green Power 2.0:
  - Minimised energy consumption and cooling costs in VFI mode.
  - Unitary power factor provides the best € / kW ratio.
  - Performance attested by Bureau Veritas.
Flexible UPS architecture
- Scalable power and energy storage capability.
- Distributed or centralised static bypass.
- Common or separated rectifier and bypass mains.
- Can be connected to shared or distributed batteries for energy storage optimisation.
- Compatible with different energy storage technologies.
- Systems parallelisation up to 2.4 MW

Standard electrical features
- Integrated maintenance bypass
- Blackfeed protection: detection circuit.
- EBS (expert Battery System) for battery management.
- Battery temperature sensor.

Electrical options
- Extended battery charger capability.
- Compatible with different battery technologies (e.g. Li-Ion, Ni-Cd,...).
- ACS synchronisation system.
- BCR (Battery Capacity Re-injection).
- FAST ECOMODE.

Standard communication features
- User-friendly multilingual interface with graphic display.
- 2 slots for communication options.
- Ethernet connection (Web/SNMp/email).
- USB port for event log access.

Communication options
- Advanced server shutdown options for stand-alone and virtual servers.
- MODBUS TCP.
- MODBUS RTU.
- BACnet/IP interface.

Remote monitoring service
- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.

Technical data

<table>
<thead>
<tr>
<th>SYSTEM CONFIGURATION</th>
<th>DELPHYS Xtend GP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xmodule rated power</td>
<td>200 kVA/kW</td>
</tr>
<tr>
<td>Number of Xbay docks</td>
<td>4 5 6</td>
</tr>
<tr>
<td>Number of Xmodule power blocks (200 kVA/kW)</td>
<td>2 3 4 2 3 4 4 5 2 3 4 5 6</td>
</tr>
<tr>
<td>Power (kVA/kW)</td>
<td>N configuration 400 600 800 400 600 800 800 1000 400 600 800 1000 1200</td>
</tr>
<tr>
<td></td>
<td>N+1 redundant configuration 200 400 600 200 400 600 600 800 200 400 600 800 1000</td>
</tr>
<tr>
<td>Max. power (systems in parallel) up to 2400 kVA/kW (12 Xmodule)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RECTIFIER INPUT</th>
<th>(1) IGBT rectifier. (2) Conditions apply. (3) With input THDV &lt; 1 %.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>400 V 3ph (200 to 480 V²)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Power factor</td>
<td>&gt; 0.99</td>
</tr>
<tr>
<td>Total harmonic distortion (THDI) at full load and rated voltage</td>
<td>2.5% (3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INVERTER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power factor</td>
<td>1 (according to IEC/EN 62040-3)</td>
</tr>
<tr>
<td>Rated output voltage</td>
<td>400 V 3ph + N (380 / 415 V configurable)</td>
</tr>
<tr>
<td>Rated output frequency</td>
<td>50/60 Hz (selectable)</td>
</tr>
<tr>
<td>Harmonic voltage distortion</td>
<td>ThdI ≤ 1.5 % with rated linear load</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BYPASS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>nominal output voltage ±15 % (settable)</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz (selectable)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>XMODULE EFFICIENCY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Online double conversion mode</td>
<td>up to 96%</td>
</tr>
<tr>
<td>Fast EcoMode</td>
<td>up to 99%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ENVIRONMENT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating ambient temperature</td>
<td>from 10 °C up to +40 °C (from 15 °C to 25 °C for maximum battery life)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>0%- 95% without condensation</td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>1000 m without derating (max. 3000 m)</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>STANDARDS</th>
<th></th>
</tr>
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<tr>
<td>Safety</td>
<td>IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2</td>
</tr>
<tr>
<td>EMC</td>
<td>IEC/EN 62040-2, AS 62040.2</td>
</tr>
<tr>
<td>Performance</td>
<td>IEC/EN 62040-3, AS 62040.3</td>
</tr>
<tr>
<td>Product declaration</td>
<td>CE, RCM (E2376)</td>
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Dimensions

<table>
<thead>
<tr>
<th>Integration(1)</th>
<th>Number of Xbay dock</th>
<th>W (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed bypass</td>
<td>4</td>
<td>4340</td>
</tr>
<tr>
<td>common or connected input</td>
<td>5</td>
<td>5850</td>
</tr>
<tr>
<td>separated input</td>
<td>6</td>
<td>5760</td>
</tr>
</tbody>
</table>

(1) For any other configuration (centralised bypass, “U” shape, “L” shape, etc.), please contact us.

Our dedicated Expert Services for UPS

We offer services to ensure your UPS highest availability:
- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services
DELPHYS Xtend GP
Three-phase UPS
Green Power 2.0 range up to 2.4 MVA/MW

An innovative way to provide scalability

AC CABINET
System input and output.
• General input(s) and output power connection.
• Centralised static bypass, if required.
• System input(s) and output\(^1\) switches.
• Maintenance manual bypass switch\(^1\).

DC CABINET
Prewired coupling for energy storage.
• Energy storage power and control cable connections.
• Connection of up to 6 batteries per system, with dedicated coupling switches.

Xbay
Easy power block docking.
• Each Xbay dock is prewired to AC and DC cabinets.
• Ready for Xmodule power and control cables connection.
• Includes individual switches for Xmodule AC coupling.
• Hot-plug parallel bus connection.
• The number of Xbay docks depends on the final power required (up to 6 per system).

Xmodule
Hot-scalable 200 kVA/kW power block.
• Power block ensuring load protection and battery management.
• Up to 6 Xmodule power blocks per system.
• Easy positioning.
• Dedicated switches for easy power block servicing.
• Secured installation both for operators and the application.

Real hot-scalable solution
• Quick and safe scalability to meet evolving demands for energy performance.
• Reliable power that can be increased when needed to rapidly meet changing capacity demands.
• Easy adaptation to site evolutions and constraints thanks to movable blocks.
• Prewired system for additional Xmodule connection and coupling within the system.
• Standard tools required to place and connect the power block.
• Online double conversion mode for load protection during system extensions or maintenance.

---

1. 600 kW, online double conversion mode
2. 600 kW, online double conversion mode
3. 30 minutes later: 800 kW, online double conversion mode

\(^1\) Please consult us for systems above 1200 kVA/kW (systems in parallel).

Example of configurations (left to right): linear with 6 Xmodule power blocks, linear with 4 Xmodule power blocks, "U-shape" with 6 Xmodule power blocks.

Example of a battery discharge test.
The test is performed on the 4th Xmodule power block at 200 kW constant power.

---

Battery Capacity Re-injection allows significant cost savings and reduces the TCO:
• No need to rent or buy load banks.
• Simplified infrastructure, as there are not any dedicated test bus bars.
• No wasted energy because it is re-used to supply other UPS or applications.
• Less time needed to perform the test as it is easy to programme.

The test is performed at a constant rate of power (full power or partial load). Each individual Xmodule power block is tested separately and feeds back the energy stored in the battery. The energy to be fed back upstream through the rectifier will correspond to the difference between the discharged power and the load consumption.
A complete solution

- Simplifies the In / Out switchboard. The system integrates localised coupling capability.
- Fast and cost-effective scalability as there is no need to connect the additional Xmodule power block(s) to any upstream or downstream panel.
- Keeps the critical applications protected in online double conversion mode during power extension.
- Possibility to parallelise systems up to 2400 kVA/kW (12 Xmodules).

Adaptable disposition

The system disposition and physical connection is easily adapted to your plant:

- Many disposition possibilities (Linear, “U”shaped, “L-shaped”).
- The number of Xbay docks can be 6 or fewer per system, depending on the rated power of the infrastructure.
- General input/output AC connections available for top or bottom entry.
- Back-up storage DC connection available for top or bottom entry.

Innovative battery discharge test

DELPHYS Xtend GP allows a periodical complete and safe battery discharge test without using a resistive load for the back-up time or availability check.

Battery Capacity Re-injection allows significant cost savings and reduces the TCO:

- No need to rent or buy load banks.
- Simplified infrastructure, as there are not any dedicated test bus bars.
- No wasted energy because it is re-used to supply other UPS or applications.
- Less time needed to perform the test as it is easy to programme.

The test is performed at a constant rate of power (full power or partial load). Each individual Xmodule power block is tested separately and feeds back the energy stored in the battery. The energy to be fed back upstream through the rectifier will correspond to the difference between the discharged power and the load consumption.

Example of a battery discharge test.
The test is performed on the 4th Xmodule power block at 200 kW constant power.

Reinjected energy
MODULYS GP
Unique, fully modular and redundant solution

Green Power 2.0 range from 25 to 600 kVA/kW

The solution for
- Computer rooms
- Data centres
- Banks
- Healthcare facilities
- Insurance
- Telecom

Advantages
- Ensures absolute business continuity
- Aligns capacity to business demand
- Optimises costs over the full life cycle

Certifications and attestations
Green Power 2.0 MODULYS GP is certified by TÜV SÜD with regard to product safety (EN 62040-1). Green Power 2.0 MODULYS GP efficiency & performance are tested and verified by TÜV SÜD.

With its flexible modularity providing seamless and risk-free power scalability up to 600 kW, the MODULYS GP range is the ideal solution for unscheduled site upgrades or incremental power evolutions. The installed power can be increased up to 600 kW by adding hot-swap plug-in power modules for incremental steps of 25 kW. Designed with no single point of failure, the MODULYS GP offers all the advantages of the Green Power 2.0 technology.

Fully modular system
- Plug-in power module.
- Plug-in battery module.
- Plug-in auxiliary mains bypass module.
- Top or bottom connection.
- Top-air exhaust module.

‘Forever Young’ concept
- Exclusive life cycle extension programme.
- Eliminates end-of-life criticality.
- Based on an electronics-free cabinet + a set of plug-in parts.
- Module compatibility guaranteed for 20+ years.
- Allows for the implementation of future module technology.

Totally redundant design
- N+1, N+x redundancy level.
- Designed for no single point of failure.
- No centralised parallel control.
- Totally independent power modules.
- Redundant parallel bus connection (ring configuration).

Enhanced serviceability performance
- Power module automatic firmware alignment.
- Fast & safe maintenance based on hot-swap parts (power modules, auxiliary mains bypass, electronic boards).
- Battery can be hot-swapped without shutting down the connected equipment.
- Ready for concurrent maintenance.
Forever Young concept

- Fully modular system
- Module compatibility guaranteed for 20+ years.
- Eliminates end-of-life criticality.
- Top-air exhaust module.
- Top or bottom connection.
- Plug-in battery module.

Green Power 2.0 technology.

Designed with no single point of failure, the MODULYS GP offers all the advantages of the power modules for incremental steps of 25 kW.

MODULYS GP range is the ideal solution for unscheduled site upgrades or incremental power.

- Three-phase UPS
- Totally redundant design
- Ready for concurrent maintenance.
- Battery can be hot-swapped without shutting down the connected equipment.
- Fast & safe maintenance based on hot-swap parts (power modules, auxiliary mains bypass, electronic boards).
- No centralised parallel control.
- N+1, N+x redundancy level.

Three-phase UPS:

- ACS synchronisation system.
- External battery cabinet.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.
- Battery temperature sensor.

Electrical options

- External battery cabinet.
- High capacity battery charger.
- ACS synchronisation system.
- Internal backfeed isolation device.

Technical data

**MODULYS GP UPS SYSTEM**

<table>
<thead>
<tr>
<th>Feature</th>
<th>25 to 200 kW</th>
<th>25 to 400 kW</th>
<th>25 to 600 kW</th>
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</thead>
<tbody>
<tr>
<td>Power (Sn)</td>
<td>25 to 200 kW</td>
<td>25 to 400 kW</td>
<td>25 to 600 kW</td>
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<td>Power (Pn)</td>
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<td>25 to 400 kW</td>
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<tr>
<td>Input / output</td>
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<td>N+x</td>
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<tr>
<td>Voltage</td>
<td>400 V 3ph+N</td>
<td>340 V to 480 V</td>
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<tr>
<td>Frequency</td>
<td>50/60 Hz ±10%</td>
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<td>Power factor / THDi</td>
<td>&gt; 0.99 / &lt; 1.5%</td>
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<tr>
<td>Power factor</td>
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<tr>
<td>Voltage</td>
<td>300/400/415 V ±1.3% 3ph+N</td>
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<tr>
<td>Frequency</td>
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<td>Voltage distortion</td>
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<td>Short-circuit current</td>
<td>up to 3 kA</td>
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<tr>
<td>Overload</td>
<td>125% for 10 minutes, 150% for 1 minute</td>
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<tr>
<td>Crest factor</td>
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<td>EFFICIENCY (TÜV SÜD VERIFIED)</td>
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<td>Online double conversion mode</td>
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<tr>
<td>up to 96.5%</td>
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<td>SYSTEM CABINET</td>
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<tr>
<td>Width</td>
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<td>Weight</td>
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<tr>
<td>MTBF</td>
<td>&gt; 1,000,000 hours (calculated and verified)</td>
<td></td>
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</tr>
</tbody>
</table>

Remote monitoring service

- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.

Hybrid bypass architecture

Best practice award

Frost & Sullivan has has awarded SOCOMEC with its prize for Innovation & Excellence in Developing Scalable, Best-in-Class Products and Solutions.

SOCOMEC’s vast expertise and technological know-how in modular UPS solutions have enabled it to develop a new modular, three-phase UPS that employs the latest cutting-edge technology combined in a unique design and architecture.

Our dedicated Expert Services for UPS

We offer services to ensure your UPS highest availability:

- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services
The benefit of a fully modular system

**Easy to manage**
- Totally modular system for power scaling or for quickly adapting to business changes.
- Standardised system and modules covering a wide range of power and back-up times.
- Repeatable and standardised scalable architecture for time-saving design for different configuration & architecture requirements.

**Pay as you need**
- No prior expenditure for unpredictable future extensions in power and back-up time.
- Space saving thanks to reduced footprint and front access.
- Eliminates installation rework costs when new capacity is required from IT physical infrastructure.
- No risk of design oversizing due to project data uncertainty.

**Everything front-access**
- Connections, switches, manual bypass, auxiliary mains static bypass, power modules and all the electric parts have front-access.
- Total footprint is not increased as rear extra clearance for maintenance is not needed.
- Easy, quick, comfortable, safe and risk-free installation and maintenance.
- More reliable system.

The benefit of a totally redundant design

**Total resilience**
- Electronics-free (failure-free) cabinet.
- Totally independent and self-sufficient modules.
- Real module selective disconnection (automatic inverter bypass with galvanic separation).
- No centralised control for parallel and load sharing management.
- Totally segregated, fully sized and centralised auxiliary mains bypass.
- Configurable N+1 to N+x redundancy (power & battery).
- No single point of failure.
- Redundant parallel bus connection (ring configuration).

**Optimum reliability**
- Power module designed for superior robustness proved by an independent body (MTBF > 1,000,000 hr).
- Hybrid bypass architecture with distributed module’s bypass and centralised mains bypass for ultimate reliability and robustness.
- Highly robust auxiliary mains bypass (MTBF > 10,000,000 hr).
- Acid leak-proof modular battery box.

**Maximum availability**
- Fast recovery of lost redundancy thanks to minimum MTTR (Mean Time To Repair).
- No risk of downtime during power upgrading and maintenance.
- No risk of failure propagation.

**Cost-effective redundancy**
- No need to duplicate the system hardware to get redundancy.
- Redundancy achievable simply by adding one more power and battery module.
- Redundancy can be easily combined with power scalability.

A flexible modular UPS system

**Fully integrated solution**
- UPS system cabinets + coupling cabinet + base plates.
- It allows a complete, simple and very reliable installation, with unique IN/OUT and fully sized manual bypass.
- Innovative base plates simplify the installation and allow a tidy and segregated cabling for higher system reliability.

**Combinable system**
- It allows the creation of a system when:
  - an external coupling cabinet is already present (i.e. in case of replacement of an existing UPS),
  - a coupling cabinet with a special configuration is required and it has to be developed specifically,
  - the UPS system cabinets cannot be installed side-by-side.
MODULYS GP
Three-phase UPS
Green Power 2.0 range from 25 to 600 kVA/kW

Fully integrated solution: easy and safe installation

1. Innovative base plates simplify the installation.
2. Safe, reliable and time-saving cabling management.
3. Cabinets are easy to move (no pallet truck required), position and assemble.
4. Easy cabling for a tidy and reliable solution.
5. Simplified cable positioning and risk-free connections.

General Catalogue 2018-2019
Seamless and risk-free scalability & upgrading
- MODULYS GP protects critical loads in all conditions, including power upgrading and maintenance procedures.
- No risk of human error and downtime.

On-line power scalability
- MODULYS GP allows you to increase power scalability and redundancy while keeping the load protected on inverter mode simply by plugging-in a new power module and waiting for its automatic self-configuration, without any human intervention.

Power module automatic firmware alignment
- Even the power module firmware alignment is totally risk free.
- When a new power module is plugged in, the system checks what firmware version is embedded and if it is different automatically aligns it to one of the other modules. The load is protected at all times while running on inverter mode.

On-line global firmware update
- It is also possible to upgrade the global firmware without switching to bypass to keep the load protected on Inverter mode.
- Automatic procedure for a risk-free firmware upgrade.
Flexible and modular back-up times

MODULYS GP offers modular solutions to meet all your requirements for back-up times (whether a few minutes or several hours) without compromising flexibility and scalability.

**Internal hot swap battery**
- Designed for short back-up time.
- Long-Life batteries available as standard.
- Compact solution with a small footprint.

**Modular hot-swap battery cabinets**
- Designed for medium and long back-up times.
- Long-Life batteries available as standard.
- Vertical and horizontal modularity ensuring flexible back-up times.

**Modular battery cabinet**
- Designed for long back-up times.
- Long-Life batteries available as standard.
- Horizontal modularity ensuring flexible back-up times.

**MODULYS GP “Forever Young” concept**
- MODULYS GP excels not only in efficiency, flexibility, capacity management and sustainability - five aspects that are crucial for optimum performance.
- It employs an exclusive concept called ‘Forever Young’ which allows the life-cycle extension of MODULYS GP and eliminates the criticality of system end-of-life.
- It also keeps the system open for the implementation of future technology improvements without modifying the infrastructure.

The ‘Forever Young’ concept:
- Is based on electronics-free (failure-free) cabinets where the components that are subject to ageing are all plug-in and therefore quick and easy to replace.
- Allows life-cycle extension via periodic replacement of power modules before they start ageing.
- Provides an always up-to-date system that uses the latest technology.
- Assures power modules and spare part compatibility and availability for more than 20 years.

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**Socomec**

Innovative Power Solutions

*Green Power 2.0* range from 25 to 600 kVA/kW

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General Catalogue 2018-2019 65
Full rack integration

- Designed for easy and no-risk integration in 19" rack cabinets.
- Total compatibility with any 19" standard rack cabinet.
- High power density.
- Easy to manage, integrate and customise.
- Flexible simplified cabling.

Overall cost optimisation

- Time saving integration process.
- No risk of cost and budget overruns.
- Compact solution saving valuable space.
- Simplified logistics.
- Easy integration: avoids costly set-up and reworking.

Totally redundant design

- N+1 redundancy level.
- Designed for no single point of failure.
- No centralised parallel control.
- Totally independent power modules.

Enhanced serviceability performance

- Fast & safe maintenance based on hot-swap parts (power modules, bypass, electronic boards, batteries).
- Ready for concurrent maintenance.
- Battery can be hot-swapped without shutting down the connected equipment.

‘Forever Young’ concept

- Exclusive life cycle extension programme.
- Eliminates end-of-life criticality.
- Based on an electronics-free sub-rack enclosure + a set of plug-in parts.
- Module compatibility guaranteed for 20+ years.
- Allows for the implementation of future module technology.
Standard electrical features
- Dual input mains.
- Internal maintenance bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.
- Battery temperature sensor.

Electrical options
- 19” 4U battery rack.
- External battery cabinet.
- High capacity battery charger.

Standard communication features
- User-friendly multilingual interface with color graphic display.
- 2 slots for communication options.

Communication options
- Dry-contact, RS232/485 interfaces.
- MODBUS RTU.
- MODBUS TCP.
- BACnet/IP interface.
- NET VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.

Technical data

<table>
<thead>
<tr>
<th>MODULYS RM GP</th>
<th>9U</th>
<th>1SU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of power modules</td>
<td>1 to 2 x 25 kW</td>
<td>1 to 4(1) x 25 kW</td>
</tr>
<tr>
<td>Configuration</td>
<td>N, N+1 redundant</td>
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</tr>
<tr>
<td>Power (Sn)</td>
<td>25 to 50 kW</td>
<td>25 to 75 kW</td>
</tr>
<tr>
<td>Power (Pp)</td>
<td>25 to 50 kW</td>
<td>25 to 75 kW</td>
</tr>
<tr>
<td>Input/output</td>
<td>3/3</td>
<td></td>
</tr>
</tbody>
</table>

**INPUT**
- Voltage: 400 V 3ph+N (340 V to 480 V)
- Frequency: 50 / 60 Hz ±10%
- Power factor / THDI: > 0.99 / < 3%

**OUTPUT**
- Voltage: 380/400/415 V ±1 % 3ph+N
- Frequency: 50 / 60 Hz ±0.1 %
- Voltage distortion: < 1 % (linear load), < 4 % (non-linear load according to IEC 62040-3)
- Short-circuit current: up to 3 kA
- Overload: 125 % for 10 minutes, 150 % for 1 minute
- Crest factor: 3.1

**HOT-SWAP BYPASS**
- Voltage: Rated output voltage ±15 % (configurable from 10 % to 20 %)
- Frequency: 50 / 60 Hz ±2 % (configurable for GenSet compatibility)
- Weight: 7 kg / 7.5 kg

**EFFICIENCY (TÜV SÜD VERIFIED)**
- Online double conversion mode: up to 96.5 %
- ENVIROMENT
  - Ambient temperature: 0 °C to 40 °C (15 to 25 °C for maximum battery life)
  - Relative humidity: 0 to 95 % without condensation
  - Maximum altitude: 1000 m without derating (3000 m max)
  - Acoustic level at 1 m: < 53 dBA

**UPS RACK**
- Dimensions: W x D x H 442 mm x 920 mm x 9 U / 442 mm x 920 mm x 15 U
- Weight (empty cabinet): 36 kg / 42 kg
- Degree of protection: IP20

**HOT-SWAP POWER MODULE**
- Height: 3U
- Weight: 34 kg
- Type: Hot plug-in / Hot-swappable
- MTBF: > 1000000 hours (calculated and verified)

**HOT-SWAP BATTERY RACK**
- Type: Acid leak-proof - Long Life batteries
- Protection: Independent protection for each battery string
- Dimensions: W x D x H 442 mm x 890 mm x 4 U
- Weight (empty rack): 15 kg

**STANDARDS**
- Safety: EN 62040-1, EN 60950-1
- EMC: EN 62040-2 Class C2
- Performance: EN 62040-3 (IEC 62306-11)
- Product certification: CE

(1): 4th module is for redundancy.

Total resilience
- Electronics-free (failure-free) sub-rack enclosure.
- Totally independent and self-sufficient modules.
- Real selective module disconnection with galvanic separation.
- No centralised control for parallel and load sharing management.
- Totally segregated, fully sized and centralised auxiliary mains bypass and distributed inverter bypass.
- Configurable N+1 redundancy (power & battery).
- No single point of failure.
- Redundant parallel bus connection (ring configuration).

Optimum reliability
- Power module designed for superior robustness verified by an independent body (MTBF > 1,000,000 hr).
- Highly robust bypass (MTBF > 10,000,000 hr).
- Acid leak-proof modular battery box.

Maximum availability
- Fast recovery of lost redundancy thanks to minimum MTTR (Mean Time To Repair).
- No risk of downtime during power upgrading and maintenance.
- No risk of failure propagation.

Our dedicated Expert Services for UPS
We offer services to ensure your UPS highest availability:
- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services
MODULYS RM GP
Three-phase UPS
Green Power 2.0 range up to 4 x 25 kW

The benefit of a system designed for 19” rack integration

Easy to integrate
- Specifically designed for integration in 19” standard rack cabinets.
- Adjustable rails and mounting accessories.
- High power density (>6 kW/U).
- Low weight for easy integration.
- Pre-cabled system for simplified connections.
- Flexible cabling management for top, bottom and mixed top/bottom entry cable.
- Integrated cables organiser for tidy connections.
- Low power dissipation (<40 W per supplied kW).

No-risk integration
- Assured compatibility with any 19” standard rack cabinet.
- Pre-engineered and lab-tested parts assuring total system reliability.
- Automatic self-configuration power modules.
- No risk of design oversize due to project data uncertainty thanks to power module scalability.

Easy to customise
- Complete set of pre-engineered and pre-tested parts to meet any customer need:
  - modular Power Modules,
  - special power modules with extra battery charger for extremely long BUT,
  - plug-in J-BUS communication board for BMS integration,
  - plug-in SNMP board for UPS monitoring and shutdown management,
  - plug-in programmable dry-contact board,
  - environmental sensors,
  - blank panels (covers for empty slots),
  - rack-mounted battery modules,
  - external battery cabinet,
  - isolation transformer,
  - bypass redundant cooling.

Easy to manage
- Full documentation package including schematics, integration instructions, technical sheets, etc.
- Factory-set configurations for easy model selection.
- Full set of pre-engineered options for easy product customisation.

Example of integration (3x25 kW).
Only 15 U of rack space occupied: space-saving design leaving free space for other rack-mounted devices. One empty slot in the MODULYS RM GP sub-rack remains available for power upgrade or redundancy.

Rear view (before adding rear protective cover). Flexible cabling management for easy connections and tidier cabling.

Pre-cabled system for simplified connections

Overall cost optimisation
- Compact sub-rack enclosure saving valuable cabinet rack space.
- 2 sub-rack enclosure models for optimum sizing.
- Best-in-class €/kW ratio thanks to high power density and PF=1.
- Cost-optimised solution for minimum initial investment.
- Plug & Play and self-configuration power modules for easy and time saving system set up.
- Pre-engineered and lab-tested parts for easy and time saving customisation.
- Repeatable and standardised architecture for time saving design and know-how capitalisation.

Simplified logistics
- Fewer standardised parts for easy ordering.
- Parts always in stock for fast procurement.
- Fewer parts covering a wide range of configurations, power, back-up time and options.
- Once integrated in the 19” rack cabinet, MODULYS RM GP can be safely shipped with the power modules plugged in.

Other options
- NET-VISION-EMD Environment temp. and humidity sensor + 4 dry contacts
- MAS-OP-TEMP External temperature sensor
- 4U battery rack M4-BR-009L With 42 x 9Ah batteries, fuse and switch
- M4-BR-009L-B Empty, for 42 x 9Ah batteries including interconnections, fuses and switch
- Mounting accessories M4-RI-OP-RAIL Adjustable rails for rack mounting support
- Pre-cabled rack with maintenance bypass M4-R-075-82B0 15U rack, 4 slots M4-R-050-82B0 9U rack, 2 slots
Overall cost optimisation

- Compact sub-rack enclosure saving valuable cabinet rack space.
- 2 sub-rack enclosure models for optimum sizing.
- Best-in-class €/kW ratio thanks to high power density and PF=1.
- Cost-optimised solution for minimum initial investment.
- Plug & Play and self-configuration power modules for easy and time saving system set up.
- Pre-engineered and lab-tested parts for easy and time saving customisation.
- Repeatable and standardised architecture for time saving design and know-how capitalisation.

Simplified logistics

- Fewer standardised parts for easy ordering.
- Parts always in stock for fast procurement.
- Fewer parts covering a wide range of configurations, power, back-up time and options.
- Once integrated in the 19” rack cabinet, MODULYS RM GP can be safely shipped with the power modules plugged in.

Pre-cabled rack with maintenance bypass

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4-R-075-82B0</td>
<td>15U rack, 4 slots</td>
</tr>
<tr>
<td>M4-R-050-82B0</td>
<td>9U rack, 2 slots</td>
</tr>
</tbody>
</table>

Plug-in boards

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-OP-ADC+SL</td>
<td>Programmable IN/OUT dry contact + serial link</td>
</tr>
<tr>
<td>CP-OP-MODTCP</td>
<td>MODBUS TCP interface</td>
</tr>
<tr>
<td>NET-VISION6CARD</td>
<td>NET VISION card, WEB/SNMP interface IPV4/IPV6</td>
</tr>
</tbody>
</table>

Other options

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NET-VISION-EMD</td>
<td>Environment temp. and humidity sensor + 4 dry contacts</td>
</tr>
<tr>
<td>MAS-OP-TEMP</td>
<td>External temperature sensor</td>
</tr>
</tbody>
</table>

Blank panel

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4-RI-OP-SSC</td>
<td>Cover for empty slot</td>
</tr>
</tbody>
</table>

Power module - 25 kW

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4-RI-25</td>
<td></td>
</tr>
</tbody>
</table>

4U battery rack

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4-BR-009L</td>
<td>With 42 x 9Ah batteries, fuse and switch</td>
</tr>
<tr>
<td>M4-BR-009L-B</td>
<td>Empty, for 42 x 9Ah batteries including interconnections, fuses and switch</td>
</tr>
</tbody>
</table>

Mounting accessories

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4-RI-OP-RAIL</td>
<td>Adjustable rails for rack mounting support</td>
</tr>
</tbody>
</table>
MASTERYS IP+
Robust, highly reliable protection for harsh environments from 10 to 80 kVA

Designed for the most demanding applications
- Designed to protect industrial processes.
- A compact solution with isolation transformer and integrated batteries.
- Robust enclosure (2 mm thick heavy steel structure).
- Floor anchoring (to prevent tilting).
- Standard IP31 protection degree.
- Dust and water splash resistant enclosure (IP52) with easy replaceable dust filters (option).
- Operation at temperature up to 50 °C.
- Wide input voltage tolerance from -40 % up to +20 % of nominal voltage.
- Double EMC immunity compared to UPS international standard IEC 62040-2.
- Double overvoltage protection.

Process continuity
- Frontal access for input/output cabling, spares replacement and preventative maintenance.
- Scalable power and high availability (using redundancy), with the facility to parallel up to 6 units.

Easy integration into industrial networks
- Input power factor > 0.99 and input current harmonic distortion < 3% thanks to IGBT rectifier.
- Compatible with Open Vented Lead Acid, Valve Regulated Lead Acid (VRLA) and Nickel Cadmium batteries.
- User-friendly multilingual interface with graphic display.
- Flexible communication boards for every industrial communication need: dry contacts, MODBUS, PROFIBUS, etc.
- Fully compatible with generator sets.
- K-rated galvanic isolation transformer embedded.
- Adaptation to typical industrial voltages (input and output).

The solution for
- Industrial processes
- Services
- Medical

Certifications
The MASTERYS IP+ series is certified by TÜV SÜD with regard to product safety (EN 62040-1).

Advantages
- Standard electrical features
- EBS (Expert Battery System) for battery management.
- Backfeed protection: detection circuit.
- Internal maintenance bypass.
- Frequency tolerance ± 2% (configurable from 1% to 8% with generating set).
- Rated frequency 50/60 Hz
- Voltage tolerance ± 15% (configurable from 10% to 20% with generating set).
- Rated voltage 1ph +N: 230 V (can be configured 220/240 V)
- Power factor / THDI 0.99 / < 3%
- Frequency tolerance ± 2% (configurable from 1% to 8% with generating set).
- Rated frequency
- Voltage tolerance ± 1%
- Rated voltage 1ph +N: 230 V

Our dedicated Expert Services for UPS
We offer services to ensure your UPS highest availability:
- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services
For industrial loads

- 100 % non-linear loads.
- 100 % unbalanced loads.
- 100 % “6-pulse” loads (motor speed drivers, welding equipment, power supplies...).
- Motors, lamps, capacitive loads.

Standard electrical features

- Dual input mains.
- Internal maintenance bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.

Technical data

<table>
<thead>
<tr>
<th>MASTERYS IP+ 10-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn [kW]</td>
</tr>
<tr>
<td>Sn [kVA]</td>
</tr>
<tr>
<td>Parallel configuration(1)</td>
</tr>
</tbody>
</table>

INPUT

- Rated voltage 400 V
- Voltage tolerance ± 20%(up to -40% @ 50% of rated power)
- Rated frequency 50/60 Hz
- Frequency tolerance ± 10%
- Power factor / THDI(2) 0.99 / < 3%

OUTPUT

- Rated voltage 1ph + N: 230 V (can be configured 220/240 V) 3ph + N: 400 V (380/415 V configurable)
- Voltage tolerance ± 1%
- Rated frequency 50/60 Hz
- Frequency tolerance ± 2% (configurable from 1% to 8% with generating set)
- Total output voltage distortion - linear load < 1%
- Total output voltage distortion - non-linear load < 5%
- Overload 125% for 10 minutes, 150% for 1 minute(3)
- Crest factor 3.1 (complying with IEC 62040-3)

BYPASS

- Rated voltage 1ph + N: 230 V, 3ph + N: 400 V
- Voltage tolerance ± 15% (configurable from 10% to 29% with generating set)
- Rated frequency 50/60 Hz
- Frequency tolerance ± 2% (configurable from 1% to 8% with generating set)

ENVIRONMENT

- Operating ambient temperature from 0 °C up to +50 °C(4) (from 15 °C to 25 °C for maximum battery life)
- Relative humidity 0% - 95% without condensation
- Maximum altitude 1000 m without derating (max. 3000 m)
- Acoustic level at 1 m (ISO 3746) < 52 dBA < 55 dBA < 65 dBA

UPS CABINET

- Dimensions (3/1) W x D x H 600 x 800 x 1400 mm 1000 x 835 x 1400 mm
- Dimensions (3/3) W x D x H 600 x 800 x 1400 mm 1000 x 835 x 1400 mm
- Weight (3/1) 230 kg 250 kg 270 kg 330 kg 490 kg 540 kg -
- Weight (3/3) 230 kg 250 kg 270 kg 320 kg 370 kg 500 kg 550 kg
- Degree of protection (according to IEC 60529) IP31 and IP52
- Colours RAL 7012

STANDARDS

- Safety IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
- EMC IEC/EN 62040-2, AS 62040.2
- Performance IEC/EN 62040-3, AS 62040.3
- Product declaration CE, RCM (E2376)

Electrical options

- Long-life batteries.
- External battery cabinet (degree of protection up to IP32).
- External temperature sensor.
- Additional battery chargers.
- Additional transformer.
- Parallel kit.
- Cold start.
- ACS synchronization system.
- Neutral creation kit for mains without neutral.
- Tropicalization and anti-corrosion protection for electrical boards.

Standard communication features

- Multilanguage graphic display.
- Dry contact interface.
- MODBUS RTU.
- Embedded LAN interface (web pages, e-mail).
- 2 slots for communication options.

Communication options

- PROFIBUS.
- MODBUS TCP.
- NET VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.

Remote monitoring service

- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.
DELPHYS MP Elite+
Resilient transformer-based power protection from 80 to 200 kVA

High quality power supply
- Permanent operation in VFI mode (online double conversion).
- Output voltage precision under all load conditions.
- High overload capability to withstand abnormal load conditions.
- A very high short-circuit current capacity which facilitates the selection of protective devices for selectivity in the downstream distribution.
- An isolation transformer installed on the inverter output to ensure complete galvanic isolation between DC circuit and load output. This insulation also provides a separation between the two inputs when they are supplied by different sources.
- Sinusoidal ThdU output voltage < 2 % with linear loads and < 4 % with non-linear loads.

Cost-effective equipment
- The "clean" IGBT rectifier allows:
  - a high efficiency,
  - a high and constant input power factor,
  - a low THDI.
  These characteristics help to limit the dimensions of upstream network infrastructure.
- Possibility to create new neutral system without additional losses (extra transformer required on by-pass line only).
- High short-circuit capability simplifies downstream protective devices.
- High power density: its small footprint saves space on your premises.
- Mains connection of the rectifier requires only 3 cables (no neutral).
- Battery connection to UPS requires only 2 cables.

High availability
- Field-proven technology.
- Fault-tolerant architecture with redundancy of basic functions, such as the ventilation system.
- Easy maintainability reduces MTTR thanks to pull-out sub-assemblies and front access all components.
- Accurate diagnostics guarantee power supply to the load.
- Cascade failure prevention for parallel systems.
- Mechanical & electrical robustness for industrial environments.
- Soft start capability (ramp up) of the IGBT inverter allows a good operation even with a genset.
- Specifically designed to be adapted to different industrial environment: high IP protection options, high peak current capability, long back up time...

User-friendly operation
- A control panel with graphic display for more ergonomic operation.
- An array of "com-slot" plug-in communication interfaces, for upgrading your operating requirements evolution.

Simplified maintenance
- An advanced diagnostic system.
- A remote access device connected to the remote maintenance centre.
- Easy access to subassemblies and components, facilitating tests and reducing maintenance time (MTTR)

The solution for
> Industry
> Processes
> Infrastructure
> Healthcare
> Service sector
> Telecommunications

Advantages
- Simplified maintenance
- Cost-effective equipment
- User-friendly operation
- High availability

Our dedicated Expert Services for UPS
We offer services to ensure your UPS highest availability:
> Commissioning
> On-site intervention
> Preventive maintenance visits
> 24-hour call out and rapid on-site repairs
> Maintenance packages
> Training

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Delphi MP Elite+
Resilient transformer-based power protection
Three-phase UPS

[Image]

DELPHYS MP Elite+
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Simplified maintenance
- An advanced diagnostic system.
- A remote access device connected to the remote maintenance centre.
- Easy access to subassemblies and components, facilitating tests and reducing maintenance time (MTTR)
Parallel systems
- Distributed or centralized bypass for parallel architecture up to 6 units.
- Redundant systems ("1+1" and "n+1").
- "2n" architecture with Static Transfer Systems.

Standard electrical features
- Slots for 3 communication cards.
- Backfeed protection: detection circuit.
- Standard interface:
  - 3 inputs (emergency stop, generating set, battery protection).
  - 4 outputs (general alarm, back-up, bypass, preventative maintenance needs).

Electrical options
- EBS (Expert Battery System)(2).
- ACS synchronisation system for 2n architecture.
- Redundant electronic power supplies.
- Hot plug option (increase the power keeping the load supplied in double conversion).
- Long back up time rectifier.

Mechanical options
- Reinforced IP protection degree.
- Dust filters.
- Fan redundancy with failure detection.
- Top entry connection.
- Reinforced IP protection up to IP52.

Communication options
- GTS (Graphic Touch Screen).
- ADC interface (configurable voltage-free contacts).
- MODBUS RTU.
- MODBUS TCP.
- PROFIBUS / PROFINET.
- BACnet/IP interface.
- NET VISION: professional WEB/SNMP interface for UPS monitoring and shutdown management of several operating systems.
- 3 extra slots for communication cards.

Remote monitoring service
- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.

Technical data

<table>
<thead>
<tr>
<th>Sn [kVA]</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>160</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph [kW]</td>
<td>72</td>
<td>90</td>
<td>108</td>
<td>144</td>
<td>180</td>
</tr>
<tr>
<td>Input/output</td>
<td>3/3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallel configuration</td>
<td>up to 6 units (distributed or centralized bypass)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INPUT**
- Rated voltage: 380V - 400V - 415V(1)
- Voltage tolerance: 342 to 460V(1)
- Rated frequency: 50/60Hz
- Frequency tolerance: ± 0.2%
- Total output voltage distortion - linear load: ThdI < 2%
- Total output voltage distortion - non-linear load: ThdI < 4%
- Short-circuit current on inverter (100ms): Up to 3.5 In
- Overload: Up to 150% for 1 minute, 125% for 10 minutes(1)
- Crest factor: 3:1

**BYPASS**
- Rated voltage: 380V - 400V - 415V
- Voltage tolerance: ± 10% (selectable)
- Rated frequency: 50/60Hz
- Frequency tolerance: ± 2% (configurable for GenSet compatibility)
- Short-circuit current on by-pass (20ms): Up to 24 In

**EFFICIENCY**
- Online mode: 93.5%
- Eco Mode: 98%

**ENVIRONMENT**
- Operating ambient temperature: from 0 °C to +40 °C(2) (from 15 °C to 25 °C for maximum battery life)
- Relative humidity: 0% - 95% without condensation
- Maximum altitude: 1000 m without derating (max. 3000 m)
- Acoustic level at 1 m (ISO 3746): 65 dBA
- UPS CABINET:
  - Dimensions W x D x H: 1000 x 800 x 1930 mm
  - Weight: 740 kg, 880 kg, 1020 kg
  - Degree of protection: IP20 (other IP as option)
  - Colours: RAL 9006

**STANDARDS**
- Safety: IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
- EMC: IEC/EN 62040-2, AS 62040.2
- Product declaration: CE, RCM (E2376)
**DELPHYS MX**

Flexible transformer-based solution for resilient architectures from 250 to 900 kVA

**Optimum load protection**
- Permanent operation in VFI mode (online double conversion).
- The inverter isolation transformer provides galvanic separation both between the DC current and the load and between the two sources.
- Output voltage precision under all load conditions.
- High overload capacity to withstand abnormal load conditions.
- Easy maintainability reduces MTTR thanks to pull-out sub-assemblies and front access to all components.
- Fault-tolerant architecture with built-in redundant components.

**Minimised Total Cost of Ownership**
- High efficiency in VFI mode, including the transformer.
- High power density: its small footprint saves space on your premises.
- The high and constant input power factor helps limit the dimensions of your upstream network infrastructure.
- Mains connection of the rectifier requires only 3 cables (no neutral).
- High short-circuit capacity simplifies downstream protective devices.

**Flexible and easily upgradable**
- Robust and reliable paralleling mode.
- Distributed or centralised bypass ensures perfect compatibility with any electrical infrastructure.
- Hot-plug capability simplifies extension or redundancy while keeping high quality power.
- The transformer based topology is adapted to all kinds of electrical installations.

**The solution for**
- Industry
- Processes
- Infrastructure
- IT applications
- Healthcare

**Attestations and certifications**

**Advantages**

**Our dedicated Expert Services for UPS**
We offer services to ensure your UPS highest availability:
- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services
德尔菲斯 MX 灵活且易于升级

- 适用于冗余架构的热插拔能力，简化了扩展或更换的需求。
- 分布式或集中式旁路确保可靠并行模式。
- 用于双端的故障冗余架构，内置故障处理。
- 在所有负载条件下，输出电压精度高。
- 永久运行在 VFI 模式，包括负载电流和直流电的隔离。

三相 UPS 配备冗余系统，保持高品质电源。

基础设施的完美兼容性。

- 从 250 到 900 kVA 的灵活变压器解决方案，适用于各种韧性架构。

德尔菲斯 MX 系列

三相 UPS

- 从 250 到 900 kVA

技术数据

<table>
<thead>
<tr>
<th>参数</th>
<th>Sn [kVA]</th>
<th>250</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>800</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn <a href="1">kW</a></td>
<td>225</td>
<td>270</td>
<td>360</td>
<td>450</td>
<td>720</td>
<td>810</td>
<td></td>
</tr>
<tr>
<td>输入/输出</td>
<td>并联配置</td>
<td>上至 6 个单位</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 输入/输出 | Pn [kW](3) | 250-500：按需提供。 (3) 根据功率范围。

电源

- 额定电压：380 V - 400 V - 415 V
- 额定频率：50/60 Hz
- 额定电流：90% (动态负载条件下的参数)
- 负载：三相输入/输出 3/3

输出

- 总输出电压畸变率 - 非线性负载
- 频率精度
- 电压精度
- 频率精度 ≥ 0.2%
- 总输出电压畸变率 - 线性负载
- 总输出电压畸变率 - 非线性负载
- 上电时间：4.4 秒
- 负载：150% 1 分钟，125% 10 分钟
- 过载：3:1
- 允许的功率因数

BYPASS

- 过载：150% 1 分钟，125% 10 分钟
- 额定电压：380 V - 400 V - 415 V
- 额定电压：± 10%
- 额定电压：± 5%

标准

- 安全：IEC/EN 62041-1, AS 62040.1.1, AS 62040.1.2
- EMC：IEC/EN 62040-2, AS 62040.2
- 表面处理：CE, RCM (E2376)

- 环境温度：0 °C 至 +35 °C (从 15 °C 至 25 °C 为电池寿命的最大温度)
- 相对湿度：0% - 95% 无结露
- 最大高度：1000 m 不需降额（最高 3000 m）
- 声学性能：≤ 70 dBA
- 尺寸：宽 x 高 x 深
- 重量：2500 kg, 2800 kg, 3300 kg, 5900 kg
- 保护等级：IP20

- CE, RCM (E2376)

- 服务：确保您的 UPS 最高可用性。
- 我们的专家服务提供全方位的服务。
- 培训和维护套餐
- 24 小时快速上门服务和快速维修
- 预防性维护
- 医疗
- IT 应用
- 基础设施
- 过程
- 行业

DELPHYS MX

三相 UPS

- 从 250 到 900 kVA

DELPHYS MX 系列

三相 UPS

- 从 250 到 900 kVA

通用目录 2018-2019

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The SHARYS IP series have been designed with the objective of reliable DC supply. Ideally suited for industrial applications, SHARYS IP combines telecom features like modularity, hot swap module replacements, redundancy N+1 and scalability along with a robustly designed frame creating an innovative mix.

Flexible design and a wide range of customization possibilities complete the package and enable the use of SHARYS IP in a wide range of situations.

**Upgradeability**
- Expandable according to future requirements by adding additional rectifier modules.

**Reliability and robustness**
- Robust steel frame.
- Degree of protection IP30.
- PCB tropicalisation as standard.
- Microprocessor control.
- Intelligent rectifier cooling.
- Battery safe thanks to the end of discharge protection (option).
- Limited thermal stress and longer life of the components.

**Total Costs of Ownership (TCO)**
- High efficiency up to 93%: low energy consumption, low heat dissipation.
- Sinusoidal current absorption with power factor close to one: low conductor heat dissipation and no plant oversize.
- Easy to install.
- Reduced maintenance costs.
- Process continuity with hot-swap capabilities (replacement of modules without any power interruption).

**Easy, user-friendly operation**
- Front mimic panel with clear working status indication.
- Digital control and monitoring of the rectifier modules.
- Adapted to be used with different types of battery technologies.
- Wide choice of communication interfaces: Dry contact, MODBUS RTU, SNMP (with NET VISION option).

(1) Contact us for power extension or customization needs.
### Technical data

#### SHARYS IP - Rectifier Module

<table>
<thead>
<tr>
<th>Model</th>
<th>24 V 50 A</th>
<th>48 V 15 A</th>
<th>48 V 30 A</th>
<th>48 V 50 A</th>
<th>108 V 20 A</th>
<th>120 V 20 A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage (V)</td>
<td>230 V 1ph + N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage tolerance (%)</td>
<td>±20% @ 100% I&lt;sub&gt;s&lt;/sub&gt; up to -50% @ 40% I&lt;sub&gt;s&lt;/sub&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>47.5 Hz – 63 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power factor</td>
<td>0.99</td>
<td>0.98</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>Absorbed current (A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inrush current on (A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OUTPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage (V)</td>
<td>24 V</td>
<td>48 V</td>
<td>108 V</td>
<td>120 V</td>
<td>24 V</td>
<td>48 V</td>
</tr>
<tr>
<td>Voltage regulation (%)</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Rated current (A)</td>
<td>50 A</td>
<td>15 A</td>
<td>30 A</td>
<td>50 A</td>
<td>20 A</td>
<td>20 A</td>
</tr>
<tr>
<td>Permanent current overload</td>
<td>105% of rated current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual ripple (A)</td>
<td>AC &lt; 50 mV, PP &lt; 100 mV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic behaviour on load variation</td>
<td>Δ V&lt;sub&gt;α&lt;/sub&gt; ≤ 4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>Forced with intelligent fan speed control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>Typical</td>
<td>90%</td>
<td>90%</td>
<td>91%</td>
<td>92%</td>
<td>93%</td>
</tr>
<tr>
<td><strong>ISOLATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input/output dielectric rigidity</td>
<td>3 kV (50 Hz for 60 s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ENVIRONMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>-5 ... 45 °C without derating, up to 55 °C with power derating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative humidity (%)</td>
<td>10% to 90%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>Forced with intelligent fan speed control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CONNECTIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td>Plug in + locking screw</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RECTIFIER ENCLOSURE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colours</td>
<td>RAL 7012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STANDARDS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>IEC/EN 61204-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMC</td>
<td>EN 61204-3, EN 61000-6-4, EN 61000-6-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Performance</td>
<td>IEC/EN 61204</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance to vibrations</td>
<td>ASTM D999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance to falls</td>
<td>ASTM D5276</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Standard electrical features

- Polarity insulated or grounded.
- Internal battery protection.
- Fitting for output DC distribution.
- Battery temperature sensor.
- PCB tropicalization.
- IP30 steel cabinet.
- Pallet truck friendly base.

### Electrical options

- BLVD battery low voltage disconnector.
- Output distribution.
- Double AC power supply.
- Double string battery protection.
- Emergency Power Off (EPO).
- Power Share.
- Coupling kit.
- Earth leakage control.
- Input surge suppressors.
- Battery cabinet.
- Enhanced protection degree.

### Standard communication features

- Dynamic interface.
- SHARYS PLUS, advanced digital controller(1).
- MODEUS RTU(1).
- 2 slots for communication options(7).

### Communication options

- NET VISION for DC systems: professional WEB/SNMP interface for DC system monitoring and shutdown management of several operating systems (7).

---

(1) System only

---

### SHARYS IP - Enclosures and Systems

<table>
<thead>
<tr>
<th>Model</th>
<th>ENCLOSURE ED</th>
<th>ENCLOSURE EX</th>
<th>SYSTEM IS</th>
<th>SYSTEM IX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage (V)</td>
<td>230 V 1ph + N</td>
<td>400 V 2ph</td>
<td>230 V 1ph + N</td>
<td>400 V 3ph</td>
</tr>
<tr>
<td>Voltage tolerance (%)</td>
<td>±20% @ 100% I&lt;sub&gt;s&lt;/sub&gt; up to -50% @ 40% I&lt;sub&gt;s&lt;/sub&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>from 47.5 to 63 Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input transformer</td>
<td>-</td>
<td>included in standard</td>
<td>-</td>
<td>included in standard</td>
</tr>
<tr>
<td><strong>OUTPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage (V)</td>
<td>24</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Rated current (A)</td>
<td>100</td>
<td>30</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Maximum power (kW)</td>
<td>2.4</td>
<td>1.4</td>
<td>2.9</td>
<td>4.8</td>
</tr>
<tr>
<td>Maximum number of rectifier</td>
<td>2 modules</td>
<td>2 modules</td>
<td>4 modules</td>
<td>3 modules</td>
</tr>
<tr>
<td>Voltage regulation (V)</td>
<td>21-29</td>
<td>42-58</td>
<td>95-131</td>
<td>105-145</td>
</tr>
<tr>
<td>Voltage ripple (Vpp)</td>
<td>50mV/mm 100mVpp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RECTIFIER CABINET</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions W x D x H mm</td>
<td>600 x 535 x (894 to 1254) mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>60 to 75 kg</td>
<td>245 kg</td>
<td>305 kg</td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colours</td>
<td>RAL 7012</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

(1) Output voltage variation depends on the recharging voltage and on the end of the discharging voltage settings (typically 1.13 V with mains present and battery charged, 0.90 V when batteries are completely discharged). - (2) Height depends on accessories and backup time. - (3) Without batteries.
Rectifier module

SHARYS RECTIFIER modules use double conversion switching technology. The combination of SMD technology, of digital microprocessor control and of IGBT components result in a highly reliable and efficient rectifier.

- Plug-in "hot-swap".
- Microprocessor control with CAN-BUS protocol communication.
- Parallel connection with active load sharing and selective disconnection of a faulty module.
- PCB conformal coating (tropicalization) as standard.

<table>
<thead>
<tr>
<th></th>
<th>24 V DC</th>
<th>48 V DC</th>
<th>108 V DC</th>
<th>120 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 A</td>
<td>-</td>
<td>SH-IP-048015</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>20 A</td>
<td>-</td>
<td>-</td>
<td>SH-IP-108020</td>
<td>SH-IP-120020</td>
</tr>
<tr>
<td>30 A</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>50 A</td>
<td>SH-IP-024050</td>
<td>SH-IP-048050</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Enclosure

Flexible modular design DC power supply system. Can include 2 rectifier modules max, suitable for full power application or redundant solution.

ED - Max 2 rectifier modules, redundancy 1+1 or full power

<table>
<thead>
<tr>
<th></th>
<th>24 V DC</th>
<th>48 V DC</th>
<th>108 V DC</th>
<th>120 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 A</td>
<td>-</td>
<td>ED048030</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>40 A</td>
<td>-</td>
<td>-</td>
<td>ED108040</td>
<td>ED120040</td>
</tr>
<tr>
<td>60 A</td>
<td>-</td>
<td>ED048060</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>100 A</td>
<td>ED024100</td>
<td>ED048100</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

EX - Max 2 rectifier modules, redundancy 1+1 or full power, integrated input transformer

<table>
<thead>
<tr>
<th></th>
<th>24 V DC</th>
<th>48 V DC</th>
<th>108 V DC</th>
<th>120 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 A</td>
<td>-</td>
<td>EX048030</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>40 A</td>
<td>-</td>
<td>-</td>
<td>EX108040</td>
<td>EX120040</td>
</tr>
<tr>
<td>60 A</td>
<td>-</td>
<td>EX048060</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>100 A</td>
<td>EX024100</td>
<td>EX048100</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

System

Complete DC power supply system

This can include up to 4 rectifier modules\(^{(1)}\), suitable for N+1 redundant solution. Useful in medium power applications such as automatic control equipment (PLC, relays, etc.) and process supply.

IS - Max 4 rectifier modules, redundancy N-1

<table>
<thead>
<tr>
<th></th>
<th>24 V DC</th>
<th>48 V DC</th>
<th>108 V DC</th>
<th>120 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 A</td>
<td>-</td>
<td>-</td>
<td>IS108080</td>
<td>IS120080</td>
</tr>
<tr>
<td>200 A</td>
<td>IS024200</td>
<td>IS048200</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

IX - Max 3 rectifier modules, redundancy N-1, integrated input transformer

<table>
<thead>
<tr>
<th></th>
<th>24 V DC</th>
<th>48 V DC</th>
<th>108 V DC</th>
<th>120 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 A</td>
<td>-</td>
<td>-</td>
<td>IX108060</td>
<td>IX120060</td>
</tr>
<tr>
<td>150 A</td>
<td>IX024150</td>
<td>IX048150</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**SHARYS PLUS control module**\(^{(1)}\)

The SHARYS PLUS advanced control and monitoring module is included as standard on all SHARYS IP SYSTEMS. A 32-digit LCD display provides easy and fast access to all information parameter settings.

- Microprocessor control with CAN-BUS protocol communication and RS232/485 port for external communication.
- Additional easy frontal LEDs indications.
- Plug-in "hot-swap" solution, easy to replace.

\(^{(1)}\) System only.

Typical configurations

- Single
- Redundant N+1
- Full redundant 1+1
- Extended full redundant

Product highlights

- Microprocessor control with CAN-BUS protocol communication.
- Microprocessor control and regulation.
- Built-in input output.
- Additional easy frontal LEDs indications.
- Port for external communication.
- Power flow indication.
- Battery discharge status.
- Status LED.
- Display.
- Fault alarm.
- Monitoring module is included as standard.
- SHARYS PLUS, it is indicated when extended communication possibilities and full setting flexibility are required.
- (1) Contact us for power extension or customization.

**SHARYS pLUS**

Thanks to the advanced controller SHARYS PLUS, it is indicated when extended communication possibilities and full setting flexibility are required.

\(^{(1)}\) Contact us for power extension or customization.
**Full battery compatibility**

SHARYS IP design is compatible with different battery technologies such as:
- Valve Regulated Lead Acid (VRLA),
- Open Vented Lead Acid,
- Nichel Cadmium.

(1) Please check the compatibility with load supply voltages.

**Mimic panel**

1. Fault alarm
2. Display
3. Selection button
4. Battery discharge status
5. Power flow indication

**Product highlights**

- Double conversion IGBT based topology
- Unitary input power factor (PF > 0.99) and low input THDI
- Hot swappable wireless modules with selective disconnection
- Wide Input Voltage and frequency range. Protection against permanent input overvoltages (up to +40%) and against surges
- PCB tropicalization
- Built-in input output galvanic isolation
- Digital microprocessor control and regulation SMD technology

**Wide temperature and environment range up to +55 °C ambient temperature**

**Constant output power**

**Can bus communication between modules**

**Active load sharing among modules**

**Speed controlled forced air cooling (temperature-load)**

**Optimized efficiency design point**

**Battery discharge status**

**Selection button**

1. V batt (VDC)
2. V in (VAC)
3. I out (A)
4. Vout (VDC)
5. V x I = cost.
6. T env. (°C)
EMergency CPSS
Secure power supply for emergency systems from 1.5 to 200 kVA

The EMergency CPSS range has been designed to answer your needs in terms of power supply for your safety system. All our EMergency products are compliant with standard EN 50171.

The EMergency CPSS products are intended to ensure energy supply to emergency escape lighting in the event of mains supply failure. Depending on the local legislation, it may be suitable for energizing other essential safety equipment, such as:

- Electric circuits of automatic fire extinguishing installations.
- Paging systems and signaling safety installations.
- Smoke extraction equipment.
- Carbon monoxide warning systems.
- Special safety installations related to specific buildings, e.g. high-risk areas.

The wide range is suitable for all standard needs. For non-standard requests, our team of experts is on hand to adapt the products to your needs.

The solution for

- Airports
- Railways and bus stations
- Schools and universities
- Hospitals
- Shopping centers
- Cinemas and theatres
- Museums
- Public buildings
- Office buildings
- Hotels

Compliance with standards

EN 50171

Our dedicated Expert Services for UPS

- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

Technical data

<table>
<thead>
<tr>
<th>MODULYS</th>
<th>MASTERYS</th>
<th>DELPHYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn [kVA]</td>
<td>1.5 3 4.5 6 10 15 20 30 40 60 80 160 200</td>
<td></td>
</tr>
<tr>
<td>Pn [kW]</td>
<td>1.05 2.1 3.2 4.2 9 13.5 18 27 36 54 72 144 180</td>
<td></td>
</tr>
<tr>
<td>Pn according to EN 50171 [kW]</td>
<td>0.87 1.8 2.6 3.5 7.5 11.3 15 22.5 30 45 60 120 150</td>
<td></td>
</tr>
<tr>
<td>Input / output</td>
<td>1/1 1/1 1/1 1/1 3/1 3/3 3/1 3/3 3/3 3/3 3/3 3/3</td>
<td></td>
</tr>
</tbody>
</table>

INPUT

- Rated voltage: 230 V (1ph+N) 400 V (3ph+N) 400 V 3ph
- Voltage tolerance: ± 20 % 240 V to 480 V
- Rated frequency: 50 - 60 Hz
- Frequency tolerance: ± 10 %
- Power factor / THDI: > 0.98 % / < 6 % > 0.99 / < 3 % 0.99 / < 3 %

OUTPUT

- Rated voltage: 230 V (1ph+N) 230 V (1ph+N) - 400 V (3ph+N) 400 V 3ph
- Voltage tolerance: ± 3 % static load ±1 % dynamic load in accordance with VFI-SS-111
- Rated frequency: 50 - 60 Hz
- Frequency tolerance: ± 0.1% ± 2 % (configurable from 1 % to 8 %)
- Overload UPS designed @ Pn: 110% for 5 min, 130% for 5 sec 125% for 10 min, 150% for 1 min
- Crest factor: 3:1

UPS CABINET

- Dimensions: W x D x H (mm) 444x795x1000 444x795x1400 700x800x1930
- Maximum weight: Embedded battery 145 220 275 380 515 - - - - - - - -
- Without battery: - - - - 120 124 127 138 158 201 211 480 500
- Protection degree: IP 20 (EN 50171)
- Acoustic level: 1m (ISO 3756) < 52 < 62 < 68

BATTERY

- Type: VRLA with 10-year life expectancy
- Standard back-up time at the end of battery life: 60/90/120 min (1)
- Charging capability: 80 % of back-up time in 12h
- Embedded battery
- Max BUT (min): Load 25% 300 300 250 300 280 External battery Load 100% 100 100 100 100 60

STANDARDS

- CPSS: EN 50171
- Safety: IEC/EN 62040-1
- EMC: IEC/EN 62040-2
- Performance: IEC/EN 62040-3
- Product declaration: CE

(1) Condition apply

Standard features

- IP20 metal enclosure compliant with EN60598-1.
- Battery charging: 80% in 12 hours.
- Battery protection against the damage due to a polarity inversion.
- Battery protection against deep discharge.
- Long-life battery with 10-year life expectancy.
- Designed to withstand 120% of the nominal charge during the entire back-up period.
- Specific dry contacts & monitoring for EMergency system.

Options

- Transformer embedded in the UPS enclosure (contact us for further information).
- Connection to downstream IT earthing system.
- Eco mode to reach up to 98% efficiency.
- Other types of battery available.

www.socomec.com/services
Secure power supply for emergency systems from 1.5 to 200 kVA

The solution for
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- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services

Technical data

<table>
<thead>
<tr>
<th>MODULYS</th>
<th>MASTERYS</th>
<th>DELPHYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn [kVA]</td>
<td>1.5</td>
<td>3</td>
</tr>
<tr>
<td>Pn [kW]</td>
<td>1.05</td>
<td>2.1</td>
</tr>
<tr>
<td>Pn according to EN 50171 [kW]</td>
<td>0.87</td>
<td>1.8</td>
</tr>
<tr>
<td>Input/output</td>
<td>1/1</td>
<td>1/1</td>
</tr>
</tbody>
</table>

INPUT
- Rated voltage: 230 V (1ph+N) - 240 V to 480 V (3ph+N)
- Voltage tolerance: ± 20 %
- Rated frequency: 50 - 60 Hz
- Frequency tolerance: ± 10 %
- Power factor / THDI: > 0.98 % / < 6 %

OUTPUT
- Rated voltage: 230 V (1ph+N) - 230 V (1ph+N) - 400 V (3ph+N)
- Voltage tolerance: ± 3 %
- Rated frequency: 50 - 60 Hz
- Frequency tolerance: ± 0.1 %
- Overload UPS designed @ Pn: 110% for 5 min, 130% for 5 sec
- Crest factor: 3:1

UPS CABINET
- Dimensions W x D x H (mm): 444x795x1000 - 444x795x1400 - 700x800x1930
- Maximum weight (kg): Embedded battery: 145 - 220 - 275 - 380
- Without battery: 515 - 120 - 124 - 127 - 138 - 158 - 201 - 211 - 480 - 500
- Protection degree: IP 20 (EN 50171)
- Acoustic level (dBA) 1m (ISO 3756): < 52 - < 62 - < 68

BATTERY
- Type: VRLA with 10-year life expectancy
- Standard back-up time at the end of battery life: 60/90/120 min (1)
- Charging capability: 80 % of back-up time in 12h
- Embedded battery load: 25% - 300 - 300 - 250 - 300 - 280
- Max OUT (min)(1): Load 100% - 100 - 100 - 100 - 60

STANDARDS
- CPSS: EN 50171
- Safety: IEC/EN 62040-1
- EMC: IEC/EN 62040-2
- Performance: IEC/EN 62040-3
- Product declaration: CE

(1) Condition apply
Complementary solutions

Back-up storage
Back-up energy and power p. 84
Battery storage systems p. 85
Battery cabinets p. 86
W-BMS p. 88
Li-Ion Battery UPS p. 90
Li-Ion Capacitor UPS p. 92

Static Transfer Systems
STATYS p. 94
STATYS XS p. 96
IT-SWITCH p. 98

Communication and Connectivity p. 100

Power Distribution Unit (PDU)
RACK PDU p. 102
In UPS applications energy storage is used for two main reasons:

**Power quality**: to support the UPS system when the mains network values fall outside the maximum acceptable UPS values, while the mains network is unavailable or until the load is switched off in a controlled manner.

**Power bridging**: to give the system upstream of the UPS time to switch between the mains network and the back-up power system, this being in most cases a generator.

### Power and energy

When the main power supply is unavailable the storage system provides the UPS with the necessary energy. This can take place in two ways depending on the specific application:

- “Power” type applications - the UPS is provided with a large quantity of power for a limited period of time e.g. power bridging applications or where the main supply is affected by micro interruptions. Back-up storage systems optimised for power-type applications can be discharged with high power, recharged very quickly, and generally perform well under cyclic operating conditions (frequent charging/discharging).

- “Energy” type applications - the UPS is provided with power for an extended period of time e.g. when the main supply is unavailable for longer than one minute.

### Sizing and Total Cost of Ownership

Various factors must be taken into account when choosing an energy storage system in order to optimise the total cost of ownership and achieve the best technical solution. The differentiating factors to consider with back-up storage technologies include:

- Purchasing costs vs budget.
- Dimensions and weight.
- Expected equipment lifetime and number of charge/discharge cycles.
- Environmental conditions.
- Characteristics of the power supply network (frequency/duration of unavailability etc.).
- Safety to be guaranteed in the technical room.
- Maintenance requirements.
Battery storage systems

Batteries

These are electrochemical devices that store energy chemically and convert it into electricity. Their use with UPS systems involves several batteries being connected in series (string) to reach the DC stage voltage required by the UPS. Strings are often connected in parallel to increase runtime in the event of a mains outage and/or for redundancy. Batteries can be installed within the UPS (normally for small UPS systems) or assembled in external cabinets or on shelving. The batteries available for use with UPS systems include:

- Normal/long life VRLA batteries with flame-retardant containers.
- Long life open-vented lead batteries with flame-retardant containers.
- Long life nickel-cadmium (NiCd) batteries for special applications.
- Lithium-ion (Li-ion) batteries with integrated monitoring and equalisation system.

Nickel-Cadmium batteries

NiCd technology uses alkaline liquid electrolyte and is especially robust and reliable. These batteries are designed to operate in difficult environmental conditions and support demanding work cycles (frequent charging/discharging), and are usually installed in dedicated rooms on shelving that enables the electrolyte to be topped up. As Cadmium is toxic the use of this type of battery is limited. Furthermore, the requirement for regular complete discharge cycles restricts the number of possible applications with UPS systems.

VRLA batteries

VRLA (Valve Regulated Lead Acid) batteries are lead batteries with a sealed safety valve container for releasing excess gas in the event of internal overpressure. Their development was aimed at limiting the emission of hydrogen into the atmosphere and to avoid the use of liquid electrolyte. The liquid electrolyte is replaced by gel electrolyte (GEL technology) or absorbed inside the separators (AGM technology) to prevent acid leaking. Sealed batteries do not allow for water to be added to the electrolyte, therefore the evaporation of the water contained in the electrolyte, due for example to high room temperatures or internal heating as a result of charging/discharging cycles, decreases their lifetime.

Open-vented lead batteries

These batteries are made with lead-based electrodes and immersed in a liquid electrolyte comprising water and sulphuric acid. They have an expected lifetime of 15-20 years and statistically are very reliable until at least halfway through their lifetime. Subsequently, a cell short circuit may occur, causing a slight reduction in the runtime but this does not cause a critical situation. Using a liquid electrolyte has some disadvantages, such as shelf installation instead of cabinets to enable electrolyte top-ups and regular inspections, and requires a suitably ventilated dedicated room for reasons of safety.

Lithium-ion batteries

Recently introduced to batteries for UPS applications, lithium-ion technology clearly differs from conventional lead and nickel-cadmium batteries. The most significant features include the considerable reduction in weight and floor space for the same runtime, the possibility of recharging them quickly, and their long cyclic and calendar lifetime. However, their relatively brief history in high-power applications, and the need to introduce monitoring and equalisation electronics into batteries (which increases the initial cost), are still inhibiting on their widespread use.
Battery cabinets
The value of your back-up time from 10 to 900 kVA

Total protection during downtime
- Designed to satisfy and respect safety protection standards (EN 50272-2 and EN 62040-1).
- The right size of protection device tailored to your power rating.
- Robust cabinet.
- Normal and long-life batteries.
- Chemical safety means shelves protected against corrosion of H2SO4 that can cause risks of electric shock and short circuit (fire).
- Designed according to the specific UPS model for easy connections, correct recharge current and appropriate discharge rating to optimize battery life.
- Modular hot-swap battery cabinets with string protection and individual string disconnection.

Easy installation and maintenance
- Frontal switch/breaker protection.
- Frontal input output connections.
- Easy battery replacement.
- Suitable for rigid cables and cable-glands.
- Suitable for tripping coil contact (on request).
- Height aligned with UPS.

Electrical protection coordination for your safety
Battery protection is essential for safety. We perform tests in our laboratories under abnormal conditions (i.e. short-circuit) to guarantee the maximum safety for the installation.

As batteries can cause fire if the protection is not adequate, we test all battery protections in real operating conditions.
- Switch/Breaker with fuse.
- Magnetothermal MCCB.

The protective devices are sized according to the UPS and to the battery short-circuit current.

Technical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard degree of protection</td>
<td>IP20 (according to IEC 60529)</td>
</tr>
<tr>
<td>Optional degree of protection</td>
<td>IP22(1)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0÷40 °C (+15 ÷ +25 °C recommended for long battery life(1))</td>
</tr>
<tr>
<td>Ambient storage and transport temperature</td>
<td>-5 °C ÷ +40 °C max (recommended: 25 °C)</td>
</tr>
<tr>
<td>Relative humidity (condensation-free)</td>
<td>up to 95%</td>
</tr>
<tr>
<td>Conforms to standards</td>
<td>EN 50272-2, EN 62040-1</td>
</tr>
<tr>
<td>Product declaration</td>
<td>CE</td>
</tr>
</tbody>
</table>

(1) Versions with a higher degree of protection and versions with a wider operating temperature range are available on request. Please contact SOCOMEC for specific battery brands and custom solutions.

Complementary pages
> MASTERYS BC
> MASTERYS BC+
> DELPHYS BC
> MASTERYS GP
> MASTERYS GP4
> DELPHYS GP
> DELPHYS XTEND GP
> MODULYS GP
> MODULYS RM GP
> MASTERYS IP+
> DELPHYS MP Elite+
> DELPHYS MX
> CPSS Emergency
Battery cabinets
The value of your back-up time
from 10 to 900 kVA

Dimensions\(^{(1)}\)

Small Masterys battery cabinet

Masterys and Delphys battery cabinet

Modular hot-swap battery cabinet - small capacity

Modular hot-swap battery cabinet - medium capacity

Modular battery cabinet - large capacity

Battery Rack

\(^{(1)}\) The dimensions specified refer to standard battery cabinets. Custom solutions are available on request. Please check with your local sales office.
The battery is a key component in the operation of a UPS

W-BMS, the SOCOMEC Battery Monitoring System, is an effective battery monitoring solution which maximizes the availability of the supply in applications where power continuity is vital.

Because 75% of uninterruptible power supply (back-up power supply) system breakdowns are down to batteries, the reliability of these components is a key feature of your electrical system. Therefore, accurate, detailed monitoring of their operating condition is vital. This actually guarantees maximum continuity of the supply to the system’s critical loads, loads which cannot tolerate even a brief interruption let alone a prolonged power cut.

Anticipate malfunctions

W-BMS is a vital tool in the continuous supply of critical systems and performs preventative battery monitoring.

This solution provides the opportunity to eliminate any unscheduled power cut due to battery failure.

Make cost savings

W-BMS enables you to make operating savings by:

• Improving UPS uptime.
• Reducing maintenance operations by 75%.
• Maximizing battery return on investment.
• Anticipating battery malfunctions.
• Guaranteeing the safety of maintenance personnel.

Ensure the continuity and safety of the supply to critical loads

It is vital to always know the operating status of the lead acid batteries supplying critical applications. W-BMS ensures that these are in good condition and will work when you need them. Unlike other battery monitoring systems, W-BMS has been specifically designed to monitor the impedance of the different battery monoblocs every day. By avoiding the time-consuming and potentially dangerous manual method of testing individual batteries, W-BMS increases the likelihood of identifying a power failure and greatly increases the safety of maintenance personnel.

Technology

• Radio frequency

Technical advantages

• Easy to use
• Easy to set up
• Trend analysis to guard against breakdowns
• Remote monitoring
• Remote alarm notification
• Data acquisition
• Analysis software

The three W-BMS components

• CU (Control Unit):
  - Collects and stores the DAM and IDAM data.
  - Manages the communication with the PC.
  - Sends SMS/E-Mail notifications.
• DAM (Data Acquisition Module):
  - Measures the voltage, the temperature and the internal resistance of each battery.
  - Stores the most significant data.
• IDAM (Current Acquisition Module):
  - Measures the current of either a battery or a string of batteries.
  - Stores the most significant data.
Close battery monitoring

Most battery monitoring systems perform an impedance test once a week or once a month. However, a battery can fail in as little as two days. It is therefore vital that your system monitors your batteries much more frequently. W-BMS has been designed to monitor the impedance of each of the battery packs or cells 24/7.

Modular design and central monitoring

W-BMS is the only battery monitoring system that can monitor different voltage monoblocs or different types of batteries (for example generator batteries) centrally. W-BMS is the easiest battery monitoring system to install and maintain.

Scalable and simple

Whether you want to add a battery branch, a part or a building, the W-BMS system offers you a vital modular system to future-proof your system.

With only three main components, expanding your system is easy. No rewiring is required and the components can even be moved to cope with your new architecture. Similarly, you can extend your system to cover your auxiliary batteries (for generator batteries, for example). W-BMS can be adjusted to cope with any changes and is a flexible, permanent solution. Your return on investment is thus guaranteed.

W-BMS INTERACTIVE option, to optimize battery lifetime

Including all the features of the standard W-BMS, W-BMS INTERACTIVE operates directly with the UPS battery recharging system (EBS). It optimizes battery capacity and maximizes battery life and return on investment.

- **Increase charger precision:** the UPS charger is able to adapt the recharge parameters according to all the information collected by W-BMS INTERACTIVE. Such corrective actions aim to standardize cell behavior to improve battery lifetime and availability.

- **Automatic battery testing:** when required, W-BMS INTERACTIVE and the UPS perform an automatic battery test. The UPS calibrates slow, safe discharge while W-BMS INTERACTIVE collects data and analyses cell blocks.

- **Proactive measures:** when a block starts to weaken, W-BMS INTERACTIVE and the UPS perform an automatic procedure to recover the block before it is totally unusable, and to enhance global battery capacity.

---

**Control Unit (CU)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>4.5 – 5.5 VDC (external power supply or USB port)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>500 mA max</td>
</tr>
<tr>
<td>Digital input</td>
<td>2x (opto-isolated)</td>
</tr>
<tr>
<td>Digital output</td>
<td>2x (dry-contact)</td>
</tr>
<tr>
<td>Data storage</td>
<td>microSD card</td>
</tr>
<tr>
<td>Number of battery blocks</td>
<td>up to 1024 (full version), up to 50 (light version)</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Ethernet, Modbus/TCP, USB, GSM (SIM-card not included)</td>
</tr>
</tbody>
</table>

**Data Acquisition Module (DAM)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>L type, H type</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>2 VDC, 12 VDC</td>
</tr>
<tr>
<td>Voltage range</td>
<td>1.5 – 5.5 VDC, 5 – 18 VDC</td>
</tr>
<tr>
<td>Acoustic level at 1 m (ISO 3746)</td>
<td>80 mA @ 2 VDC, 30 mA @ 12 VDC</td>
</tr>
<tr>
<td>Measurements</td>
<td>voltage, impedance, temperature</td>
</tr>
<tr>
<td>Battery connection</td>
<td>blade connector (fasten), ring or alligator clip</td>
</tr>
</tbody>
</table>

**Current Acquisition Module (IDAM)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>type 1, type 2</td>
</tr>
<tr>
<td>Rated current</td>
<td>300 A, 600 A</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>9 – 18 VDC (external power supply or battery)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>50 mA</td>
</tr>
<tr>
<td>Current range</td>
<td>up to 300 A, up to 600 A</td>
</tr>
</tbody>
</table>
Li-Ion Battery UPS

Compact innovative power protection solution

The solution for
- Data centres
- IT infrastructures
- Applications requiring a back-up time up to 15 minutes

UPS interaction

The ultimate solution for fuller control over system availability.

The Socomec Li-ION BATTERY UPS solution includes an interactive control system to check and manage all the Li-Ion cells’ parameters (i.e. temperature, voltage, current, charging status, etc.) and to dynamically adapt how the UPS operates depending on the status of the Li-Ion battery.

The UPS interaction guarantees the most reliable performance and improves the system’s availability by:
- Ensuring a proper control of the Li-Ion battery
- Preventing any irreversible overcharge failure
- Performing automatic corrective actions in case of any critical conditions that can affect battery performance.

Maximum availability
- Very fast UPS battery recharge.
- Ensured scalability for power upgrades or redundancy.
- Reduced maintenance of battery components.

Cost-effective solution
- High power density in a reduced footprint.
- 15+ years’ expected service life.
- Higher cycling capacity: 10 times more than VLRA Battery UPS.
- Fewer cooling requirements.

Extreme reliability
- Optimum performance in all critical operating conditions.
- Interactive UPS battery control.
- Embedded cell-to-cell monitoring.
- Wide operating temperature range (0 °C to +40 °C).

High sustainability

Socomec is committed to developing solutions that reduce the environmental impact from the design stage and throughout their entire life cycle.

The Li-Ion Battery UPS energy system is the latest solution designed for helping environmental sustainability:
- No toxic materials
- REACH / RoHS compliant materials
- No gas emissions
- No risk of acid leakage.

Maximum availability
- Very fast UPS battery recharge.
- Ensured scalability for power upgrades or redundancy.
- Reduced maintenance of battery components.

Cost-effective solution
- High power density in a reduced footprint.
- 15+ years’ expected service life.
- Higher cycling capacity: 10 times more than VLRA Battery UPS.
- Fewer cooling requirements.

Extreme reliability
- Optimum performance in all critical operating conditions.
- Interactive UPS battery control.
- Embedded cell-to-cell monitoring.
- Wide operating temperature range (0 °C to +40 °C).
Li-Ion Battery UPS
Compact innovative power protection solution

Back-up storage solution
with VRLA batteries

Back-up storage solution
with Li-Ion Battery UPS

More valuable space saved
thanks to reduced footprint

Li-Ion Battery UPS: footprint comparison with VRLA batteries

Li-Ion Battery UPS: footprint comparison vs. Lead-Acid batteries

<table>
<thead>
<tr>
<th>Li-Ion Battery UPS</th>
<th>Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power: 200 kVA</td>
<td>Footprint: 0.95 m²</td>
</tr>
<tr>
<td>Back-up time: 8 min</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Li-Ion Battery UPS</th>
<th>VRLA Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power: 500 kVA</td>
<td>Footprint: 4.32 m²</td>
</tr>
<tr>
<td>Back-up time: 9 min</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Li-Ion Battery UPS</th>
<th>Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power: 1.2 MVA</td>
<td>Footprint: 7.87 m²</td>
</tr>
<tr>
<td>Back-up time: 8 min</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Li-Ion Battery UPS</th>
<th>VRLA Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power: 1.2 MVA</td>
<td>Footprint: 13.93 m²</td>
</tr>
<tr>
<td>Back-up time: 8 min</td>
<td></td>
</tr>
</tbody>
</table>

(1) Other configurations: please contact us.
Power outages lasting a few seconds to several minutes may cause damage, loss in production and cost increases to applications and processes sensitive to short duration downtime.

To ensure the optimum availability and a long-life cycle for batteries, the power supply has to be protected by a powerful UPS back-up storage solution with:
- Very short recharging time.
- Low maintenance.
- Constant monitoring.

LI-ION CAPACITOR UPS is the innovative UPS back-up storage solution specifically designed to protect:
- Applications requiring back-up times of a few seconds to several minutes.
- Processes sensitive to frequent micro interruptions.
- Applications working in critical environments where hazardous substances are not allowed.
- Applications with severe ambient conditions.

Lithium-ion capacitors:
- Operating principle
  - The activated carbon is a capacitor cathode.
  - The Li-doped carbon anode is a battery anode, undergoing Li doping during charge and de-doping during discharge.
  - Hybrid construction creates a capacitor which yields the best performance features of batteries and capacitors.

High sustainability
- Socomec is committed to developing solutions that reduce the environmental impact from the design stage and throughout their entire life cycle.
- LI-ION CAPACITOR UPS is the latest solution designed for helping environmental sustainability:
  - Safe, low-toxic materials
  - REACH/RoHS compliant materials
  - No gas emission
  - No risk of acid leakage.
Li-Ion Capacitor UPS
Powerful and reliable solution for applications requiring short back-up times

Maximum availability
• Ultra-fast recharge.
• Ensured scalability for capacity or redundancy.
• Fire-safe construction.

Extreme reliability
• Optimum performance in all critical operating conditions.
• Ageing-free in any frequent process micro interruption.
• Wide operating temperature range.
• Embedded cell-to-cell monitoring.

Cost-effective solution
• Ultra-high power density in a reduced footprint.
• 15+ years’ service life.
• Easy and extremely low maintenance.

High modularity and granularity
STATYS provides

- High reliability - internal redundant design to ensure service continuity.
- Flexibility and adaptability to various types of applications.
- Compact design: saves up to 40% of valuable space.
- Easy and secured maintenance.
- Operational security and ease of use. Remote data access in real time and from any location.
- Full support and service.

Static Transfer Switch: user benefits

Supplied by two independent alternate sources, STATYS increases the overall electrical infrastructure availability during abnormal events and programmed maintenance.

- Provides redundant power supply to mission critical loads to increase global uptime of the supplied system.
- Increases the power supply availability by choosing the best power supply quality.
- Provides plant segmentation and prevents fault propagation.
- Allows easy extension and easy infrastructure design, ensuring high availability of the power supply to critical applications.
- Facilitates and secures the maintenance or the modifications of the overall electrical installation (source, distribution, switchboard) while the load is kept supplied.

STATYS also provides protection against:

- Main power source outage.
- Failures in the upstream power distribution system.
- Failures caused by faulty equipment supplied by the same source.
- Operator errors.

Flexibility

STATYS offers a wide range of three-phase systems that suits all types of applications and power supply systems. Dual or single cord servers, linear or non-linear loads, IT or electromechanics are just some of the load types that STATYS can supply. Wherever a smart power source is needed, whether for existing or new electrical plants, STATYS can be easily installed and efficiently supply the load.

It is available in:

- 2 wires and 2 poles switching, to be connected between phase/neutral or phase/phase.
- 3 wires arrangement without neutral, - for reduced cable costs,
- - for local zoning of the applications by using insulating transformers,
- 4 wires three-phase arrangement with neutral, with or without neutral pole switching.

STATYS offers:

- Flexible digital control capacity that can adapt to any operational or electrical environment conditions,
- Capability to manage synchronised and non-synchronised sources according to load specificity,
- Advanced Transformer Switching Management (ATSM). If the upstream network has no distributed neutral cable, two upstream transformers or one downstream transformer can be added to create a neutral reference point at the output. For the downstream solution, STATYS, thanks to ATSM, correctly manages the switching to limit inrush current and avoid the risk of spurious breakers.

The solution for

- Finance, banking and insurance
- Healthcare sector
- Telecom & Broadcasting
- Industry
- Power generation plants
- Transport

Our dedicated Expert Services for STS

We offer services to ensure your STS highest availability:

- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

www.socomec.com/services
High reliability - Internal redundant design

Main features:
- Redundant control system using double microprocessor control boards.
- Dual redundant power supplies for control boards.
- Individual control board with redundant power supply for each SCR path.
- Redundant cooling with fan failure monitoring.
- Real-time SCR fault sensing.
- Separation of main functions to prevent internal fault propagation.
- Robust internal field communication bus.
- Internal monitoring of sensors to ensure maximum system reliability.

Compact design

- Small footprint and compact units.
- Adjacent or back to back mounting.
- Integrable chassis version for optimal implementation into switchboards.
- Front access for easy maintenance.
- Compact Hot Swap 19" rack system.

Standard features

- Smart commutation system configurable according to the load.
- Synchronised and non-synchronised sources compatibility (configurable synchronisation tolerance and switching management).
- Fuse-free or fuse-protected design.
- Output fault current sensing.
- Internal CAN Bus.
- Double maintenance bypass.
- Neutral oversizing for non-linear loads compatibility.
- Embedded Inputs, output and maintenance bypass switches (cabinet version).

Standard communication features

- Ethernet network connection (WEB/SNMP/eMail/MODBUS TCP).
- Dry-contact interface.
- Flexible Com Slots.
- LCD or Graphic Mimic Panel.
- Full digital configuration and setting.

Options

- Additional dry contacts interface board.
- MODBUS RTU.
- PROFIBUS interface.
- Automatic maintenance bypass interlock.
- Voltage adaptation.

Remote monitoring

- 24/7 real-time remote data access.
- Wide choice of communication protocols for remote monitoring and easy integration in your BMS / SCADA systems.
- UNK-UPS, remote monitoring service that connects your STS to your Critical Power specialist 24/7.

Technical data

### STATYS

<table>
<thead>
<tr>
<th>STATYS</th>
<th>19&quot; rack - hot swap</th>
<th>Cabinet - Integrable chassis (OEM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating [A]</td>
<td>32</td>
<td>63</td>
</tr>
<tr>
<td>ELECTRICAL SPECIFICATIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 10% (configurable)</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>50 Hz or 60 Hz (± 5 Hz (configurable))</td>
<td></td>
</tr>
<tr>
<td>Number of phases</td>
<td>ph+N or ph-ph (+ PE)</td>
<td>3ph+N or 3ph (+ PE)</td>
</tr>
<tr>
<td>Number of poles switching</td>
<td>2-pole switching</td>
<td>3 or 4-pole switching</td>
</tr>
<tr>
<td>Maintenance bypass (cabinet version)</td>
<td>Interlocked and secured</td>
<td></td>
</tr>
<tr>
<td>Overload</td>
<td>150% for 2 minutes - 110% for 60 minutes</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>99%</td>
<td></td>
</tr>
<tr>
<td>Admissible power factor</td>
<td></td>
<td></td>
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<tr>
<td>ENVIRONMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>0-40 °C</td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>1000 m a.s.l. without derating</td>
<td></td>
</tr>
<tr>
<td>Acoustic level at 1 m (ISO 3746)</td>
<td>&lt;45 dBA</td>
<td>≤ 60 dBA</td>
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<tr>
<td>STANDARDS</td>
<td></td>
<td></td>
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<tr>
<td>Safety</td>
<td>IEC 62310, IEC 60529, AS 62310, AS 60529</td>
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<tr>
<td>EMC</td>
<td>C2 category (IEC 62310-2, AS 62310.2)</td>
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<td>Product declaration</td>
<td>CE, RCM (E2376)</td>
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### Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>19&quot; Rack</th>
<th>Integrable Chassis (OEM)</th>
<th>Cabinet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 - 63</td>
<td>63 - 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>483 (19&quot;)</td>
<td>483 (19&quot;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>747</td>
<td>648</td>
</tr>
<tr>
<td></td>
<td></td>
<td>89 (2U)</td>
<td>400 (6U)</td>
</tr>
<tr>
<td>3 phases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>300 - 400</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>700</td>
<td>900</td>
</tr>
<tr>
<td></td>
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<td>690(1)</td>
<td>690(1)</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

(1) Depth does not include handles (+40 mm)
**STATYS XS**

Reliable transfer system for redundant power supply
16 and 32 A - Rack mounted

**Ensured power continuity**
- Provides redundant power supply to single-corded IT equipment.
- Powered by two independent sources.
- A competitive alternative to redundant power supply (dual-corded) in the equipment cabinet in terms of price and features.
- Fast transfer time without source overlapping (ITI curve compliant).
- Maintenance-free equipment.

**Easy rack integration**
- Easy installation in 19” rack cabinets.
- Compact enclosure saving valuable cabinet rack space.
- Plug and Play devices pre-configured according to Socomec’s STS field experience.
- Easy and quick connection of the loads via multiple IEC 320 outlets.
- Integrated backfeed protection device for even easier electrical integration.

**Agility and ease of use**
- Front panel with LCD display for intuitive control and easy management.
- Source selection from the front panel without modifying the cabling.
- Automatic and manual transfer.
- Synchronised and non-synchronised sources management.
- LCD display of all input and output values.
- Configuration tool for easy customisation of rated voltage, monitoring parameters/ tolerances, functionalities and operation.

**Flexible remote management**
- Remote management via LAN networks (SNMP).
- Real-time monitoring (RS485).
- Configurable dry contacts communication port via local setup connection port.

**The solution for**
- Rack servers
- IT networking
- Hubs & routers

**Advantages**

**Certifications**

- RoHS COMPLIANT
Automatic Transfer System

STATYS XS

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16 and 32 A - Rack mounted

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The solution for
• Rack servers
• IT networking
• Hubs & routers

Advantages

19" NON-STOP Certifications
• RoHS COMPLIANT

STATYS XS
Automatic Transfer System
16 and 32 A - Rack mounted

Front view

1. Control and monitoring panel
2. Setup connection ports
3. Dry contacts port
4. Slot for RS485 or SNMP board

Connections

1. Source input sockets (2x IEC 320-C20)
2. 16 A output socket (IEC 320-C19)
3. 10 A output sockets (2x 4x IEC 320-C13)
4. Source input terminals
5. Output protections
6. 16 A output sockets (2x IEC 320-C19)
7. 10 A output sockets (2x 8x IEC 320-C13)

Technical data

<table>
<thead>
<tr>
<th>Model</th>
<th>STATYS XS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT / OUTPUT</td>
<td></td>
</tr>
<tr>
<td>Rated current</td>
<td>16 A (configurable 10 A to 16 A)</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>200 / 208 / 220 / 230 / 240 V</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 10% (configurable)</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>± 10% (configurable)</td>
</tr>
<tr>
<td>Transfer time</td>
<td>ITIC curve compliant</td>
</tr>
<tr>
<td>Admitted overload</td>
<td>125% for 1 minute, 150% for 30 seconds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONNECTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
</tr>
<tr>
<td>Output</td>
</tr>
</tbody>
</table>

COMUNICATION AND USER INTERFACES

| Display | LCD display |
| Standard communication features | slot for optional communication board, 5 dry contacts (voltage-free, configurable), setup connection port for configuration tool |
| Communication options | SNMP card, RS485 card |

ENVIRONMENT

| Operating ambient temperature | up to +40 °C |
| Relative humidity | 5% to 90% without condensation |
| Acoustic level at 1 m (ISO 3746) | < 25 dBA |

MECHANICAL SPECIFICATIONS

| Dimensions W x D x H | 440 (19") x 285 x 44 mm (1U) | 440 (19") x 360 x 88 mm (2U) |
| Weight | 4 kg | 6 kg |

STANDARDS

| Directives | 2014/35/UE, 2014/30/UE |
| Standards | IEC60950-1, CEIEN 02319-2 |
| Environmental | WEEE, ROHS |
| Product declaration | CE |
**IT SWITCH**

Seamless power transfer for reliable architectures from 16 to 20 A single-phase

---

**Continuity of service for critical applications**
- Located as close as possible to the application, the IT SWITCH allows a highly accessible architecture.
- It protects against:
  - main power source outage,
  - spurious tripping of upstream protection,
  - the result of mutual interference caused by faults in the applications (e.g.: short-circuit) being supplied from the same source.

**A secure power supply adapted to your equipment**
- IT SWITCH has been designed to be easily installed near sensitive applications, to fit into 19" racks.
- Different versions: fixed or swappable to meet all your power availability requirements.

**Easy site operation**
- Easy changing of the preferred supply path without modifying the cabling.
- Switching from one path to another, carried out by the operator and secured by the IT SWITCH automatic controls and protections.
- Easily adapts to match site specificity via standard or customised operating settings.

**User-friendly operation**
- IT SWITCH is fitted with a control panel that is easy to operate and guarantees safe operation.
- The communication software allows easy operation of the different equipment on-site.

**Operating principle**
IT SWITCH is an automatic transfer system between two sources. It is digitally controlled by microcontrollers to transfer the loads instantly, without disruption and without overlapping the sources.

**Automatic transfer**
The detection of a failure in the preferred source triggers the automatic and instantaneous transfer to the alternate source without disturbing the supply to the load. The "break before make" transfer is carried out without overlapping in order to prevent interference between the sources.

**Manual control**
The IT SWITCH manual control allows the operator to transfer the loads securely to one of the sources in order to carry out maintenance operations.

**Choosing the preferred source**
The operator chooses a preferred source for each IT SWITCH.
The parameters of each source and of the supply to the loads are permanently monitored.

**Separating loads**
The system inhibits the transfer in the event of a fault in the equipment supplied downstream. This discrimination avoids the faulty current being transferred onto the other source so as not to disturb other users.

"Hot Swap" power units
The extractable version of the IT SWITCH HA increases system availability. The hot swappable plug-in unit means the control and power unit can be taken out without interrupting the supply to the applications. The fixed chassis is equipped with a double maintenance bypass, which guarantees simple and totally secure operation.

---

**The solution for**
- Data centres
- Processes
- Telecommunications
- Air traffic control

**Our dedicated Expert Services for STS**
We offer services to ensure your STS highest availability:
- Commissioning
- On-site intervention
- Preventive maintenance visits
- 24-hour call out and rapid on-site repairs
- Maintenance packages
- Training

---

**Technical data**

### Source 1 to Source 2
- Short-circuit current 20 / 15 In(1)
- Input voltage tolerance adjustable (factory setting ±15 %)
- Rated voltage single-phase 100 / 120 / 220 / 230 / 240 V
- Rated current 16 A

### Source 2 to Source 1
- Crest factor up to 4
- Frequency tolerance ±10% adjustable
- Rated frequency
- Operating ambient temperature

---

**About the manufacturer**

Socomec is a French company that designs, manufactures, and distributes electrical distribution systems. Their products are used in various sectors, including data centres, processes, telecommunications, and air traffic control. Socomec offers a range of solutions to meet the needs of different markets, ensuring reliable power supply and system availability.
**Installation and operation**

IT SWITCH HA (High Availability) is especially suited to sensitive applications thanks to its advanced transfer parameter controls: source synchronisation, power quality adaptation, operating modes and downstream fault current.

IT-SWITCH HA-E swappable version (High Availability) offers an additional “hot swap” function which enables users to perform maintenance procedures without shutting down the loads.

**Distributed redundancy**

![Diagram of distributed redundancy](image)

**Technical data**

<table>
<thead>
<tr>
<th>IT SWITCH</th>
<th>HA 19” rack</th>
<th>HA-E 19” extractable rack</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELECTRICAL SPECIFICATIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated current</td>
<td>16 A</td>
<td>16 A</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>single-phase 100 / 120 / 220 / 230 / 240 V</td>
<td></td>
</tr>
<tr>
<td>Input voltage tolerance</td>
<td>adjustable (factory setting ±15 %)</td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50 or 60 Hz</td>
<td></td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>±10% adjustable</td>
<td></td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>20 / 15 kA</td>
<td></td>
</tr>
<tr>
<td>Crest factor</td>
<td>up to 4</td>
<td></td>
</tr>
<tr>
<td><strong>MAINTENANCE BYPASS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changeover switch</td>
<td>bipolar (phase/neutral)</td>
<td></td>
</tr>
<tr>
<td>Transfer mode</td>
<td>synchronous/asynchronous “break before make”</td>
<td></td>
</tr>
<tr>
<td><strong>CONNECTIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input and output on terminal blocks</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input and output on IEC 16 A sockets</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>ENVIRONMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>0 to 40 °C</td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>Natural</td>
<td></td>
</tr>
<tr>
<td><strong>MECHANICAL SPECIFICATIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions W x D x H</td>
<td>449 x 310 x 131 mm</td>
<td>449 x 400 x 133 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>8.5 kg</td>
<td>14 kg</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP21</td>
<td></td>
</tr>
</tbody>
</table>

1) Depending on model. 2) 484 mm with front fixing squares (19" rack integrable).

**Command and control mimic panel**

![Image of command and control mimic panel]

1. Preferred source (1 or 2)
2. Input voltage source 1 or 2 within tolerances
3. Load on source 1 or 2
4. Transfer not possible
5. Transfer blocked
6. Imminent stop
7. Maintenance bypass on (hot swap version)
8. Manual transfer to source 2
9. Alarm reset & preferred source selection
10. Manual transfer to source 1
11. General alarm

**Standard transfer features**

- Preferred source selection.
- Automatic transfer.
- Manual transfer.
- Changeover without source overlap.
- Synchronized and non-synchronized source management (fully adaptable modes).
- Transfer lock on downstream fault.
- Configurable synchronisation tolerance.
- Lock on repetitive transfers automatic restart setting.
- Automatic restart configurability.

**Standard mechanical features**

- 19” rack.

**Standard communication features**

- Command and control mimic panel.
- Dry-contact interface.
- MODBUS RTU (only RS485 serial port).

**Maintenance**

- “Hot swap” pull out module (model HA-E).
- Maintenance Bypass (model HA-E).
# Communication and connectivity

**The ideal solution for integrated system management and data integrity**

<table>
<thead>
<tr>
<th>Your application</th>
<th>Your need</th>
<th>Our Communication solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OFFICE</strong></td>
<td>Local UPS monitoring</td>
<td>LOCAL VIEW</td>
</tr>
<tr>
<td></td>
<td>Local PC shutdown management</td>
<td>- Local UPS monitoring software.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- USB or RS-232 serial port.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Clear, immediate and detailed information on the status of the UPS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Automatic system shutdown in the event of a prolonged power cut.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Protection from data loss and system damage.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- For Microsoft Windows, Linux and MacOS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Free download from <a href="http://www.socomec.com">www.socomec.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>IT &amp; NETWORKING</strong></th>
<th>Remote UPS monitoring</th>
<th>NET VISION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remote server shutdown management</td>
<td>- Ethernet interface for remote UPS monitoring and server-based workstations shutdown management via web browser.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Specifically designed for business networks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Direct interface between the UPS and Ethernet network with no dependence on the server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compatible with all networks and most operating systems.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>JNC</strong></th>
<th>Remote server, hosts and virtual machine shutdown management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Software for controlled network server shutdown.</td>
</tr>
<tr>
<td></td>
<td>Shutdown Client installed on the remote server:</td>
</tr>
<tr>
<td></td>
<td>- warns user during shutdown procedure.</td>
</tr>
<tr>
<td></td>
<td>- can execute specific script before shutting down the Operating System,</td>
</tr>
<tr>
<td></td>
<td>- performs Operating System shutdown.</td>
</tr>
<tr>
<td></td>
<td>- For Microsoft Windows, Linux and MacOS operating systems.</td>
</tr>
<tr>
<td></td>
<td>- Free download from <a href="http://www.socomec.com">www.socomec.com</a></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>BUILDING</strong></th>
<th>UPS and STS supervision</th>
<th>REMOTE VIEW PRO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>- Supervision software dedicated to UPS or STS provided with Ethernet connection and SNMP protocol.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Remote UPS and STS monitoring from any computer connected on the same network, LAN or WAN architecture via web browser.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compliant with all SOCOMEC UPS and STS and with almost all UPS manufacturers using RFC1628 MIB file.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compliant with Windows server with Internet Information Service.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>INDUSTRY</strong></th>
<th>Communication capability in various environments</th>
<th>COMMUNICATION INTERFACES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>- Compatible with industrial PROFIBUS and PROFINET systems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compatible with BACNET BMS monitoring.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- MODBUS TCP compliancy for SCADA system.</td>
</tr>
</tbody>
</table>
Management solutions
The ideal solution for integrated system management and data integrity

Main features
- Automatic UPS recognition.
- UPS, battery and load monitoring.
- Alarms notification on local screen.
- Battery test control.
- Local PC shutdown + test procedure.
- Measurements and UPS event logs.
- Email notification.
- Automatic updates via Internet.

VIRTUAL JNC
- Software for controlled virtual machines and Hosts shutdown.
- Shutdown Client installed on a Windows Virtual Machine:
  - warns user during shutdown procedure,
  - stops Virtual Machines in specific order or time delay,
  - performs Host shutdown.
- For Microsoft Hyper-V, VMware and XenServer.
- Free download from www.socomec.com

MODBUS TCP and BACnet
Ethernet interface to communicate with BMS systems.
All UPS information can be remotely accessed.

PROFIBUS / RS485 MODBUS RTU
Communicate with PLC or automation systems.
All UPS information can be remotely accessed.

UPS range compatibility
- NETYS PL
- NETYS PE
- NETYS PR
- NETYS RT
- ITYS
- ITYS PRO
- MODULYS
- MODULYS RM GP
- NETYS PR
- NETYS RT
- ITYS
- ITYS PRO
- MODULYS
- MODULYS GP
- MASTERYS
- DELPHYS
- NETYS PR
- NETYS RT
- ITYS
- ITYS PRO
- MODULYS
- MODULYS GP
- MASTERYS
- DELPHYS

Main features
- Secure network connection.
- Multi-user login.
- Email notification.
- SNMP agent TRAP notification.
- WakeOnLan to restart server.
- Control access protected by firewall.
- NTP to synchronise UPS clock.
- JNC protocol for servers shutdown, in addition to JNC or VIRTUAL-JNC shutdown software.

Main features
- Browser user interface.
- UPS and STS synoptic display.
- Event and history log.
- Multi-user and Multi-site access.
- Picture or Google map background.
- Reports and email notification.
- License:
  - Free (up to 10 devices)
  - Silver (up to 200 devices)
  - Gold (more than 200 devices)
**RACK PDU**

Compact and reliable power distribution unit
monitored and managed rack PDU

Ensuring efficient load development and power supply flexibility in server rooms is becoming increasingly important, which is why SOCOMEC offers a variety of PDUs for rack applications. SOCOMEC PDUs in 0U configuration (single-phase or three-phase) with metered or monitored technology, and PDUs in 1U configuration (still single-phase but with single or dual power supply) with managed technology, allow IT managers to find the configuration best suited to their requirements.

**Metered or monitored Zero-U vertical PDU**

With only one single-phase or three-phase input, these PDUs guarantee reliable power distribution for equipment with small and medium-scale energy requirements integrated into rack cabinets. The PDU does not require the installation of “U space” due to its vertical position on the rear of the rack cabinet, and simplifies the electrical connection of many devices, saving time during fitting procedures and offering easy power supply configuration adjustment. The numerous output sockets and their positioning help this PDU fit perfectly into high density network solutions.

Using two PDUs in the same rack cabinet allows the development of a redundant architecture typical of critical applications which use dual cord electronic devices.

**Monitoring and supervision**

The two-digit LED display allows an easy reading and monitoring of the current consumption.

The reverse display function allows the cable input both from above and below, ensuring a proper reading in every installing position.

The ADD-IN SNMP module (available as an option), allows the remote control and monitoring of the PDUs via LAN network.

---

The solution for

- Data center rack cabinet
- Networking infrastructure
- Computer rooms

---

**Technical data**

<table>
<thead>
<tr>
<th>Item code</th>
<th>NRT-OP-PDU1-28</th>
<th>NRT-OP-PDU3-39</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input / output</td>
<td>1/1</td>
<td>3/1</td>
</tr>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>200-240 V (1ph)</td>
<td>346-415 V (3ph, Y+N)</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Rated current</td>
<td>32 A (1ph)</td>
<td>16 A (3ph)</td>
</tr>
<tr>
<td>Connector</td>
<td>IEC309-32 A</td>
<td>IEC309-16 A</td>
</tr>
<tr>
<td><strong>OUTPUT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>200-240 V</td>
<td></td>
</tr>
<tr>
<td>Connectors</td>
<td>(24) IEC320-C13, (4) IEC320-C19</td>
<td>(36) IEC320-C13, (3) IEC320-C19</td>
</tr>
<tr>
<td><strong>COMMUNICATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interfaces</td>
<td>RS232 - (WEB/SNMP optional)</td>
<td></td>
</tr>
</tbody>
</table>

**Environmental sensor**

- **Operating ambient temperature**: 0 to 45°C
- **Relative humidity**: 5% to 95% without condensation
- **Maximum altitude**: operating: up to 2000 m

**Dimensions W x D x H**

- Single-phase model: 48 x 1250 x 50 mm
- Three-phase model: 48 x 1560 x 50 mm

**Weight**

- 5.4 kg
- 6.0 kg
**Zero-U PDU**

Connections

1. ON-OFF switch segment #1
2. ON-OFF switch segment #2
3. ON-OFF switch segment #3
4. Output connectors segment #1
5. Front panel
6. Output connectors segment #2
7. Output connectors segment #3

Communication options

PDU VISION, WEB/SNMP manager interface for the connection to the LAN network. The device - suitable for remote monitoring – can be integrated into the PDU.

### Technical data

<table>
<thead>
<tr>
<th>Zero-U PDU</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item code</td>
<td>NRT-OP-PDU1-28</td>
</tr>
<tr>
<td>Input/output</td>
<td>1/1</td>
</tr>
<tr>
<td>INPUT</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>200-240 V (1ph)</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Rated current</td>
<td>32 A (1ph)</td>
</tr>
<tr>
<td>Connector</td>
<td>IEC309-32 A</td>
</tr>
<tr>
<td>OUTPUT</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>200-240 V</td>
</tr>
<tr>
<td>Connectors</td>
<td>(2) IEC320-C13, (4) IEC320-C19</td>
</tr>
<tr>
<td>COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>Interfaces</td>
<td>RS232 - (WEB/SNMP optional)</td>
</tr>
<tr>
<td>Environmental sensor</td>
<td></td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td></td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>0 to 45 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5% to 95% without condensation</td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>operating: up to 2000 m</td>
</tr>
<tr>
<td>RACK PDU</td>
<td></td>
</tr>
<tr>
<td>Dimensions W x D x H</td>
<td>48 x 1250 x 50 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>5.4 kg</td>
</tr>
</tbody>
</table>
Technology

Power protection vs. UPS topology ......................................................... p.106
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Different backup storage for UPS systems .............................................. p.116
Power protection vs. UPS topology

Power quality (PQ) is a significant challenge to those responsible for the management of electrical networks and Data Centre facilities. The widespread use of and increasing dependence upon electronic equipment - such as information technology equipment, power electronics including programmable logic controllers (PLC) and energy-efficient lighting - have led to a complete transformation in the nature of electrical loads. These loads are both the major root causes of - and the major casualties of – power quality problems. Due to their non-linearity, all these loads cause disturbances in the voltage waveform.

Along with advances in technology, the organisation of the worldwide economy has evolved towards globalisation and the profit margins of many activities have seen a tendency to decrease.

The increased sensitivity of the vast majority of processes (industrial, services and even residential) to PQ problems means that the availability of high quality electric power is a crucial factor in terms of developing competitive advantage across every market sector. It’s widely understood that mission-critical facilities must run continuously, and, of course, that any power interruption, even for a short time, can disrupt business operations and result in significant financial losses.

Although today’s Data Centres are all designed with a high level of inherent redundancy in order to minimise downtime, just as important as the mission-critical applications themselves, however, is the quality of the supplied power.

In order to achieve the delivery of consistent, high quality power, it is vital to understand the nature of PQ disturbances and their causes.

What affects the power quality?

The most common disturbances that adversely affect the power quality are:

• power sags or outages due to network faults,
• short voltage variations due to the connection of heavy loads or the presence of faults in the network,
• distortion of currents and voltages due to non-linear loads present in the system or in the systems of other utilities, etc.
• flicker due to large intermittent loads,
• asymmetry in the supply voltage system.

How to ensure the power quality: the UPS

Modern technology offers various solutions to ensure the power quality; static UPS systems are undoubtedly the most versatile and widely used and can be adopted for a very broad range of power ratings.

In response to the need to classify the various types of static UPS systems currently available on the market, the standard EN 62040-3 was developed. It distinguishes between three major topologies, according to the internal schemes adopted:

• VI "line interactive"
  Voltage and Frequency Dependent - Utilities are normally powered by the mains supply. In the event of power loss the load is automatically switched over to a built-in battery to keep it supplied without interruptions.

• VFI "online double conversion"
  Voltage and Frequency Independent - The load is supplied by the mains power supply and protected against under and over voltages by an AVR (Automatic Voltage Regulator) voltage stabilizer. If the mains power is lost, the load is instantaneously powered by the battery.

• VFD “offline”
  Voltage and Frequency Dependent - This is the only UPS working-mode that assures total load protection against all possible mains quality problems. The power is converted twice (AC to DC through a rectifier then DC to AC through an inverter) to provide high quality voltage, stable frequency and protection against power grid disturbances. If the mains power is lost, the load is powered exclusively by the battery. The internal bypass supplies the utilities in case of inverter output voltage anomalies.
In response to the need to classify the various types of static UPS systems currently available on the market, the standard EN 62040-3 is widely used and can be adopted for a very broad range of power ratings. Modern technology offers various solutions to ensure the power quality; static UPS systems are undoubtedly the most versatile and effective means of doing so.

What affects the power quality?
Power quality (PQ) is a significant challenge to those responsible for the management of electrical networks and Data Centre facilities. Although today’s Data Centres are all designed with a high level of inherent redundancy in order to minimise downtime, just as important is the availability of high quality electric power is a crucial factor in terms of developing competitive advantage across every market sector. The increased sensitivity of the vast majority of processes (industrial, services and even residential) to PQ problems means that the reliability and availability of the power supply is a key performance indicator. If equipment is not designed to cope with PQ issues, this can have a dramatic impact on the ability of systems to operate effectively, leading to productivity losses and downtime.

What are the common disturbances that adversely affect the power quality?
Power quality issues are very diverse and can be caused by a large number of factors. The most common disturbances that adversely affect the power quality are:
- Voltage fluctuations due to the connection of heavy loads or the presence of faults in the network,
- Power sags or outages due to network faults,
- Flicker due to large intermittent loads,
- Distortion of currents and voltages due to non-linear loads present in the system or in the systems of other utilities, etc.
- Short voltage variations due to the connection of heavy loads or the presence of faults in the network,
- Power surges or interruptions due to network faults,
- Noise
- Transient
- Voltage interruption
- Voltage sag/dip
- Voltage fluctuation
- Under voltage
- Voltage surge
- Voltage spike/transient
- Harmonic distortion
- Noise
- Frequency variation
- Notching

<table>
<thead>
<tr>
<th>Disturbance type</th>
<th>Wave form</th>
<th>Possibles causes</th>
<th>Consequence</th>
<th>UPS topology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage interruption</td>
<td></td>
<td>Mainly due to opening and automatic re-closure of protection devices to decommission a faulty network section. The main fault causes are insulation failure, lightning and insulator flashover.</td>
<td>Tripping of protection devices, loss of information and malfunction of data processing equipment.</td>
<td>• • •</td>
</tr>
<tr>
<td>Voltage sag/dip</td>
<td></td>
<td>Faults on the transmission, in distribution network, or in consumer’s installation. Start-up loads.</td>
<td>Malfunction of IT equipment, safety systems, or lighting. Loss of data. System shutdown.</td>
<td>• • •</td>
</tr>
<tr>
<td>Voltage fluctuation</td>
<td></td>
<td>Transmitters (radio), faulty equipment, ineffective grounding, proximity to EM/RFI source.</td>
<td>Most consequences are common to under-voltages. System halts, data loss. The visible consequence is the flickering of lighting and screens.</td>
<td>• • •</td>
</tr>
<tr>
<td>Under voltage</td>
<td></td>
<td>Increase of consumption, voltage reduction to lower the consumption.</td>
<td>System halts, data loss, stop of sensitive equipment</td>
<td>- • •</td>
</tr>
<tr>
<td>Voltage surge</td>
<td></td>
<td>Atmospheric, surges are due to lightning; Transient, surges are due to insulation faults between phase and earth or rupture of neutral conductor; Switching, surges are due to opening of protection devices, generated by energizing capacitor banks or caused by variations in inductive current.</td>
<td>Data loss, flickering of lighting and screens, stop or damage of sensitive equipment.</td>
<td>- • •</td>
</tr>
<tr>
<td>Voltage spike/transient</td>
<td></td>
<td>Lightning, ESD, switching of lines or power factor correction capacitors, utility fault clearing.</td>
<td>Destruction of electronic components, data processing errors or data loss.</td>
<td>- - •</td>
</tr>
<tr>
<td>Harmonic distortion</td>
<td></td>
<td>Modern sources like all non-linear loads such as power electronics equipment including ASSIs, switched mode power supplies, data processing equipment, high efficiency lighting.</td>
<td>Increased probability in occurrence of resonance, neutral overload in 3-phase systems, overheating of all cables and equipment, loss of efficiency in electric machines, electromagnetic interference with communication systems, errors in measures when using average reading meters, nuisance tripping of thermal protections.</td>
<td>- - •</td>
</tr>
<tr>
<td>Noise</td>
<td></td>
<td>Transmitters (radio), faulty equipment, ineffective grounding, proximity to EM/RFI source.</td>
<td>Disturbances on sensitive electronic equipment, usually not destructive. May cause data loss and data processing errors.</td>
<td>- - •</td>
</tr>
<tr>
<td>Frequency variation</td>
<td></td>
<td>Unstable operating of the generator, unstable frequency of the utility power system.</td>
<td>System halts, data loss.</td>
<td>- - •</td>
</tr>
<tr>
<td>Notching</td>
<td></td>
<td>Fast switching of power components (diodes, SCR, etc.); rapid variation in the load current (welding machines, motors, lasers, capacitor banks, etc.).</td>
<td>System halts, data loss.</td>
<td>- - •</td>
</tr>
</tbody>
</table>
Solution to meet availability and flexible performance

Different configurations make it possible to create architectures to meet the most stringent requirements for availability, flexibility and energy saving and to allow the following:

**Easy operation**
Given the criticality of applications supplied downstream from the UPS units, maintenance shutdowns are less and less feasible. Various different configurations have been studied specifically to deal with this operational constraint.

**Power increases**
The upgrading over time of the applications supplied often requires the possibility of increasing UPS power. The configurations offered allow for this requirement so that your initial investment is saved.

**Increases in availability**
To increase availability, the addition of a unit in parallel that is surplus to the power requirements of the applications (redundant) will ensure a continuous power supply if an inverter shuts down, without resorting to a bypass.

### Stand-alone UPS unit

**An upgradeable solution**
This architecture is secured by an integrated automatic bypass, which constitutes a first level of redundancy guaranteed by the network. The maintenance bypass function allows maintenance to be carried out without shutting down applications. It can be the first stage of your investment, with the possibility to upgrade, as your requirements change, to a modular parallel architecture to increase power or availability (redundancy).

### Parallel UPS systems

**Development without constraint**
This is the simplest solution to ensure power supply availability and flexibility in case of unscheduled installation upgrades by means of the parallel configuration of the UPS units, each one incorporating its own bypass. This configuration enables power output to be increased and is suitable for N+1 redundancy. Upgrades can also be performed keeping the load supplied by the system.

For higher agility, parallel UPS systems are also available with a centralised bypass on the auxiliary power source: in this configuration, the static bypass is in parallel of the UPS modules and can be sized according to particular site constrains (short-circuit withstand, selectivity, etc.).
Vertical and horizontal modular system

Flexible and completely modular
This is a new, innovative UPS concept that can adapt to all types of growth. Power can be increased by successively adding modules. The increasing of availability (redundancy) is simply carried out by adding a module to the number required to meet the power requirements for the applications. All the modules are connectible (plug-in). Removal or adding of modules can be carried out with the system running (hot swap) without affecting the general operation of the installation.
Solution to meet availability and energy saving performance

Green Power 2.0

Energy Saving: high efficiency without compromise.
- Offers the highest efficiency in the market using VFI – Double Conversion Mode, the only UPS working-mode that assures total load protection against all mains quality problems.
- Ultra high efficiency output independently tested and verified by an international certification organization.
- Ultra high efficiency output tested and verified in a wide range of load and voltage operating conditions to have the value in real site conditions.
- Ultra high efficiency in VFI mode is provided by an innovative topology (3-Level technology) that has been developed for all the Green Power 2.0 UPS ranges.

Full-rated power: kW=kVA
- No power downgrading when supplying the latest generation of servers (leading or unity power factor).
- Real full power, according to IEC 62040: kW=kVA (unity power factor design) means 25% more active power available compared to legacy UPS.
- Suitable also for leading power factor loads down to 0.9 without apparent power derating.

Significant cost-saving (TCO)
- Maximum energy saving thanks to 96% efficiency in true double conversion mode: 50% saving on energy losses compared to legacy UPS resulting in cheaper energy bills.
- UPS “self-paying” with energy saving.
- Energy Saver mode for global efficiency improvement on parallel systems.
- kW=kVA means maximum power available with the same UPS rating: no overdesign costs and therefore less €/kW.
- Upstream infrastructure cost optimization (sources and distribution), thanks to high performance IGBT rectifier.

Energy Saver mode for global efficiency improvement on parallel systems.

kW = kVA

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Solution to meet availability and energy saving performance

Fast EcoMode

Available as an optional feature for the DELPHYS GP series, FAST EcoMode is an automatic operating mode that optimizes the efficiency depending on the quality of the input voltage (voltage, frequency, harmonic distortion). When the input voltage is within tolerances (value is settable), the load is supplied by the bypass (VFD mode) and the efficiency achieved is 99%. If the voltage becomes out of tolerances, the system instantaneously transfers the load to On-line mode until normal condition recovery.

Batteries are permanently maintained under floating charging, maximizing battery lifetime and avoiding periodic restarts of the rectifier.

Energy Saver

- This function optimizes the efficiency ($\eta$) of your UPS in parallel when operating with a partial load.
- Only the UPS needed to supply the energy required by the applications are in operation.
- Redundancy can be ensured by maintaining an additional unit in operation.
- When the power consumed by the applications increases, the UPS units needed to meet the increased power requirements restart instantly.
- This type of operation is perfectly suited to applications subject to frequent variations in power.
- Energy Saver enables the increased efficiency of the whole system to be maintained.
UPS technologies

Transformer-based and transformerless technologies

The two main UPS technologies available on the market are:

- transformer-based, useful when primary and secondary sources come from different mains with different neutral systems,
- transformerless, which offers the advantages of high efficiencies combined with a low footprint.

Both of these technologies have their advantages and drawbacks. The challenge is to make the right compromise, taking into account site conditions with design constraints such as the footprint, neutral system, efficiency, short-circuit currents and so on. SOCOMEC can provide customers with either technology, depending on the requirement.

A "clean" IGBT rectifier

This eliminates any disturbance on the upstream network (power source and distribution).
- This rectifier technology guarantees the supply of current with an exceptionally low rate of harmonic distortion: THDI < 2.5 %.

A consistent rectifier

- The performance of the IGBT rectifier is independent of frequency variations that could be produced by the generator set.
- The power factor and THDI at the rectifier input are constant whatever the battery charge status (continuous voltage level) and the load rate of the UPS.

An economical IGBT rectifier

- The power factor upstream of the rectifier is 0.99, reducing by 30% the used kVA compared with conventional technology.
- The reduction in input current results in a saving in terms of the size of sources, cables and protective devices.
- Rectifier capabilities:
  - low upstream THDI,
  - gradual, timed restarting,
  - possibility of suspending battery recharge when operating with a generator set.
- This allows the impact caused when the generator set is engaged to be reduced, as well as the energy used and the footprint.

DELPHYS MX guarantees optimal compatibility with your low voltage electrical power supply system and, in particular, with your generator sets:
- sinusoidal current at rectifier THDI input: < 4.5 % without filter,
- increased power factor upstream of the rectifier: 0.93 without filter, reducing the current consumed, and therefore the size of cables and protective devices,
- gradual, sequential start-up of the rectifiers in parallel, facilitating take up by the generating set,
- delayed battery recharge when running on generating set to reduce power consumption.

SVM, digital Space Vector Modulation

The SVM (digital Space Vector Modulation), along with the isolation transformer installed on the inverter output, provide:
- perfectly sinusoidal output voltage THDV < 2 % with linear loads and < 3 % with non-linear loads,
- output voltage precision even when the load is completely unbalanced between phases,
- an immediate response to major variations in the load, without deviating the output voltage (< 2% in less than 5 ms),
- a very high short-circuit capacity up to 4 In (Ph / N) allows selectivity,
- a complete galvanic isolation between DC circuit and load output.

SVM, the latest high performance components and IGBT power bridges enable the supply of:
- non-linear loads with high crest factor up to 3,
- active power without derating, for loads with a lagging power factor and up to 0.9 leading.

### Table: Harmonics Comparison

<table>
<thead>
<tr>
<th>Harmonics</th>
<th>THD %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1%</td>
</tr>
<tr>
<td>3rd</td>
<td>2%</td>
</tr>
<tr>
<td>5th</td>
<td>2,5%</td>
</tr>
<tr>
<td>7th</td>
<td>3%</td>
</tr>
<tr>
<td>11th</td>
<td>3%</td>
</tr>
<tr>
<td>13th</td>
<td>3%</td>
</tr>
<tr>
<td>17th</td>
<td>4,5%</td>
</tr>
<tr>
<td>19th</td>
<td>5%</td>
</tr>
</tbody>
</table>

### Diagram: THD Comparison

- Traditional three-phase rectifier with thyristor
- 12-pulse rectifier
- Low distortion rectifier DELPHYS MX
Static Transfer Systems (STS) for high availability architecture

Static Transfer Systems (STS)

Static Transfer Systems (STS) are intelligent units that transfer the load to an alternative source when the primary source is out of tolerance. This ensures “high availability” of the power supply for sensitive or critical installations.

The purpose of STS devices is to:
- ensure the redundancy of the power supply to critical installations by means of two independent power sources,
- increase power supply reliability for sensitive installations,
- facilitate the design and expansion of installations that guarantee a high-availability power supply,
- increase the overall site flexibility, allowing easy and safe maintenance or source replacement.

STS systems incorporate reliable and proven solid-state switching technologies (SCR), enabling them to perform fast, totally safe automatic or manual switching without interrupting power to the supplied systems. The use of high-quality components, fault-tolerant architecture, the ability to determine the location of the fault, management of faults and loads with high inrush currents: these are just some of the characteristics that make STS systems the ideal solution for achieving maximum power availability.

STS can also protect against:
- main power source failure,
- spurious tripping of upstream protective devices,
- mutual disturbances caused by faulty equipment (short-circuit) supplied by the same power source,
- operating errors (circuit opening) occurring in the supply chain.

Static Transfer Systems: some examples of usage

Normally, STS provide redundancy between 2 independent UPS systems. Each STS is sized according to the load (or set of loads) it protects.

It is advisable to install the STS device as close as possible to the load, so as to ensure redundancy of the upstream distribution and to keep the single fault point (the conductor between STS and load) as short as possible. The use of several STS also provide electrical load segregation.

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- operating errors (circuit opening) occurring in the supply chain.
Static Transfer Systems (STS)

Static Transfer Systems ensure high business availability and provide site maintenance agility.

The ‘2N + STS’ architecture ensures the load is always supplied by high power quality on each input, even if one power distribution is down due to critical fault or for long-term maintenance (e.g., source replacement or failure of the electrical infrastructure).

The combination of a multi-source architecture and STS connecting the load to two independent sources ensures they are always supplied even if one of them is down. The critical facility therefore benefits from very high fault tolerance.

In both examples, the STS can be centralised (one high STS rating for each power distribution switchboard) or distributed (close to each server room, row, rack, etc.). The choice of either solution depends on the installation to be protected and on the expected availability or the requested level of maintainability.
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Expert Battery System: protecting your battery investment

Expert Battery System (EBS) technology is a system which manages the battery charger. It responds to the working temperature to preserve battery life and reduce operating costs by:

- charging according to an algorithm which adapts to the environment and the condition of the battery,
- eliminating overloading effects due to permanent floating voltage, which accelerates the corrosion of the positive plates and causes the separators to dry out,
- isolating the DC battery bus, (independent charger function). Premature ageing, caused by residual ripple from the inverter bridge is eliminated.

Tests carried out by SOCOMEC on several brands of batteries, together with years of experience, show that battery life can be enhanced by up to 30% with the use of EBS compared to a traditional battery management system.

Shared battery: optimisation of battery size for parallel systems

Available with distributed batteries, DELPHYS GP allows you to optimise battery size thanks to shared battery operation. This reduces the overall system footprint, the weight of the required batteries, the battery monitoring system, the amount of wiring needed and amount of lead. Associated with an appropriate connection design (fuses and coupling switches), this solution also allows you to increase the availability of the battery set and UPS units in case of internal fault.
Different back-up storage for UPS systems

The battery is an electrochemical energy storage system able to generate a difference in potential that can make an electric current circulate in a circuit until the energy is exhausted.

Batteries can be divided into two categories:

- Primary: batteries which, once exhausted, cannot be recharged and returned to their initial state of charge (non-rechargeable batteries).
- Secondary: these batteries, also known as accumulators, can be recharged and returned to their initial state of charge. They are recharged with a battery charger which should have suitable characteristics to charge the specific battery technology.

Battery parameters and definitions

- Capacity (C): the mean current expressed in Ah which the battery supplies in a complete discharge carried out over a precise period of time. For example, C indicates the current supplied by the battery in case of discharge in 1 hour, C/5 the current in case of discharge in 5 hours, C/10 in case of discharge in 10 hours, etc.
- The rated capacity depends on the battery technology: for example, the rated capacity for lead-acid batteries is C/10, while for NICD batteries is C/5.
- Energy density: the amount of energy stored per unit of volume or weight expressed in Ah/kg or Wh/kg.
- Depth of Discharge (DoD): the fraction of the capacity (or of energy) taken from the battery during the discharge phase. Expressed as a % of the capacity, it is calculated using the following formula:

\[
\text{DoD} = \frac{\text{Discharged capacity}}{\text{Rated capacity}}
\]

- State of Charge (SoC): the fraction of the capacity (or of energy) remaining in a battery. Expressed as a % of the capacity, it is calculated using the following formula:

\[
\text{SoC} = \frac{\text{Remaining capacity}}{\text{Rated capacity}} = 1 - \text{DoD}
\]

\[
\text{DoD} + \text{SoC} = 100\%
\]

- Calendar Life: the time after which the battery, regularly charged and kept at a controlled temperature, reduces its initial rated capacity to 80%. Normally, battery manufacturers talk about the "expected life", as this is an estimate obtained from laboratory tests. Battery service life is an important parameter for comparing various battery technologies.
- Cycle Life: the number of charge and discharge cycles at controlled temperature that the battery can withstand before the rated capacity is reduced to 80% of the initial value. The cycle life is very sensitive to temperature and to the depth of charge, to the extent that it is declared at a specific DoD value.
- Actual life: the battery service life in real conditions of use. This depends on the Calendar life, the Cycle life, the ambient temperature and the type of charge and discharge.
- Self-discharge: the percentage of charge capacity lost by the battery when not used (e.g. during storage in the warehouse). The parameter is linked to the type of battery and also depends highly on temperature (when the temperature increases, the self-discharge percentage increases).
- Internal impedance: this is composed of an inductive, a capacitive and a resistive part. It impedes the passage of current, increasing heat generation in the discharge phase. The most important part of the impedance to be monitored is the resistive part, as it indicates the state of health of the battery and on possible deterioration in progress. The internal resistance is influenced by various factors, the most important of which is temperature. The typical impedance values change according to the battery technology and capacity.

![Lead battery calendar life floating at 20 °C](image1)

![Lead battery calendar life vs. temperature (Eurobat)](image2)

![Moderate climate, Cycle Life comparison](image3)
Lead acid battery (LA)

Lead acid batteries are the most used battery type for stationary applications. Expected life for this kind of batteries is from 3 to 12 years according to Eurobat classification. Cycle life is usually poor even if certain of these batteries have good levels of performance in cycling applications. Lead acid batteries offer a mature and well-researched technology at low cost. There are many types of lead acid batteries available, e.g. vented and sealed housing versions (called valve-regulated lead acid batteries, VRLA, requiring less maintenance). VRLA batteries can be AGM (absorbed glass material, where the electrolyte is absorbed in a fiber glass) or GEL type (where the electrolyte is a gel used in higher temperature environments and in specific applications). One disadvantage of lead acid batteries is usable capacity decrease when high power is discharged. For example, if a battery is discharged in one hour, only about 50% to 70% of the rated capacity is available. Other drawbacks are lower energy density (lead has heavy specific weight) and the use of lead, a hazardous material prohibited or restricted in specific environments and applications. Advantages are a favorable cost/ performance ratio, easy recyclability and a simple charging technology.

Nickel cadmium battery (NiCd)

Compared to lead acid batteries, NiCd batteries have a higher power density, a slightly greater energy density and the number of cycles is higher. NiCd batteries are relatively rugged, are the only batteries capable of performing well even at low temperatures in the range from -20 °C to -40 °C, and their life expectancy is still good even at high temperature, so they are used in warm countries and in applications where high temperature is a constraint. Large battery systems using vented NiCd batteries operate on a scale similar to lead acid batteries. NiCd are normally vented so they need be stacked vertically with good ventilation, and they cannot be transported in a charging condition (electrolyte is shipped separately).

Lithium-ion battery (Li-ion)

Li-ion batteries have high gravimetric energy density, meaning that a Li-ion battery solution is lighter and needs less floor space compared to LA or NiCd batteries. For Li-ion batteries the calendar life (over 10 years) and cycle life (thousands of cycles) are very good even at high temperatures. Give that the round-trip efficiency is high and with no over sizing for short back-up time (typical for UPS applications), it can be seen that Li-ion technology has several technical advantages. Most of the metal oxide electrodes are thermally unstable and can decompose at elevated temperatures, releasing oxygen which can lead to a thermal runaway. To minimize this risk, Li-ion batteries connected in series to obtain a voltage compatible to the UPS range are equipped with a monitoring unit to avoid over-charging and over-discharging. A voltage balance circuit is also installed to monitor the voltage level of each individual cell and prevent voltage deviations among them.

Supercapacitors / Ultracapacitors

There are a number of different technologies that fall under the name ‘supercapacitors’ or ‘ultracapacitors’. The two main technologies are:

- Symmetric Electrical Double Layer Capacitors (Symmetric EDLC), where activated carbon is used for both electrodes. The charge mechanism is purely electrostatic: no charge moves across the electrode/electrolyte interface.
- Asymmetric Electrical Double Layer Capacitors (Asymmetric EDLC) where a battery electrode is used for one of the electrodes. The battery electrode has a large capacity in comparison to the carbon electrode, so that its voltage does not change significantly with charge. This allows a higher overall cell voltage.

Super capacitors deliver quick bursts of energy during peak power demands, then quickly store energy; their extremely low internal resistance enables a very fast discharge and recharge with unbeatable round-trip efficiency. In addition, they usually do not use hazardous materials, and they have very low self-discharging so use little current when in floating mode (which means less energy consumption for the UPS) and can go for long periods without being recharged.

Lithium-ion capacitors (LIC)

The capacitor is a hybrid between a battery and a capacitor (asymmetric EDLC). The Li-ion capacitor comprises an activated carbon cathode (hence no safety risks due to thermal runaway), an anode of Li-doped carbon and electrolyte containing a Li salt, as in a battery. This hybrid construction creates a capacitor which yields the best performance features of batteries and capacitors. The hybrid battery construction offers many advantages. These include high energy density and high voltage, the benefit being when connected in series, up to a 1/3 fewer LIC cells are needed compared to a conventional EDLC capacitor. Another advantage is the very low level of self-discharging; the LIC can hold 95% of its charge for 3 months. As it takes so little current when in floating mode, the UPS requires less energy consumption and the LIC can go for longer periods without being recharged.

LIC technology also has the added benefits of higher safety levels (no risk of thermal runaway), a high power density and quick charging and discharging. It is also more reliable, with high cycling (its estimated life is 1 million charge/discharge cycles) and resistance to a wider temperature range (±20 °C to 70 °C) that makes it ideal for use in difficult operating environments.

Flywheel

Flywheels store energy in the form of momentum in a spinning mass. An electric motor spins the rotor to a high velocity to charge the flywheel. During discharge, the motor acts as a generator, converting the rotational energy into electricity. The energy stored in a flywheel depends on the mass and on the velocity according to the following equation:

$$E = \frac{1}{2} J \omega^2$$

Where \(J\) is the moment of inertia and \(\omega\) is the angular velocity. Since the energy has quadratic proportion with angular velocity it is very important that the flywheel runs at very high velocity (over 30,000 rpm), for these reasons modern flywheels use magnetic levitation to avoid friction losses and spins under a sealed vacuum. The flywheel does not suffer restrictions due to high temperature (no calendar life reduction), does not have any hydrogen emission during recharging (as in the case of lead-acid batteries), can be recharged in a very short time, has a high-cycling range without reducing its expected life, does not use any use of hazardous materials, and can be installed where space for installation is limited. Flywheels have an output power measured in hundreds of kW and so are ideal for use in high power UPS systems.

Compressed air energy storage (CAES)

In compressed air energy storage, electrical power is used to compress air and store it in a dedicated structure. When power is required, the compressed air is immediately converted to electricity by driving it through a scroll expander, in turn driving an electrical generator. The typical application is for power bridging (to switch mains power to genset power) but not in case of frequent micro interruptions. CAES systems can be parallelized to increase back-up time or to add redundancy. CAES can also be used in harsh environments and their long calendar life is not affected by temperature. When the system is fully charged it does not require any significant energy consumption, increasing the overall efficiency of a traditional battery-based UPS system.

(1) Thermal runaway: a situation under abnormal operating conditions where a battery generates heat at a higher rate than it can dissipate. Thermal runaway can melt the plastic components of the batteries, releasing gas, smoke and acid that can damage adjacent equipment.
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