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### IT applications - Overview of Critical Power

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

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</tr>
</tbody>
</table>
## Non-IT applications

Overview of Secure Power solutions  

| 10 kVA |
| 20 kVA |
| 50 kVA |
| 100 kVA |
| 150 kVA |
| 200 kVA |
| 300 kVA |
| 500 kVA |

### Desktop / Tower UPS
- NETYS PE
- NETYS PR
- ITYS E
- ITYS PRO
- Convertible 19" Rack & Rack/Tower UPS

### Single unit & 1+1 configuration UPS
- MASTERYS BC 60-80 p.
- MASTERYS GP
- MASTERYS GP4
- DELPHYS BC

### Single & 3/1 configuration UPS systems
- MASTERYS MC p.
- MASTERYS GP
- MASTERYS GP4
- DELPHYS GP p.
- DELPHYS MX p.

### Modular & scalable UPS systems
- MODULYS RM GP p.
- MODULYS RM GP p.
- MODULYS GP p.
- MODULYS GP4
- DELPHYS XTEND GP p.

### General Catalogue 2018-2019

## Complementary solutions

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

| 1 - 20 kVA |
| 1/1 & 3/1 - Tower |
| 1.1 - 11 kVA |
| 1/1 - Convertible Rack/Tower |
| 16 - 80 kVA |
| 3/1 & 3/3 - 3/3 |
| 100 - 80 kVA |
| 3/1 & 3/3 - up to 240 kW |

### Single & 3/1 configuration UPS systems
- 10 - 40 kVA/kW
- 3/1 & 3/3 - Transformer-based - up to 5.4 MVA

### Modular & scalable UPS systems
- 10 - 20 kVA
- 3/1 & 3/3 - Tower
- 15 - 80 kVA
- 3/1 & 3/3 - up to 960 kW

### 60 - 160 kVA/kW
- 3/3 - Fully modular solution
- 3/3 - real hot-scalable UPS system

### 25 - 600 kVA/kW
- 3/3 - Rack-mounted modular UPS system
- up to 2.4 MVA/MW

### 200 - 300 kVA
- 3/3

### 160 - 1000 kVA/kW
- 3/3 - up to 4 MVA

### 250 - 900 kVA
- 3/3 - Transformer-based - up to 5.4 MVA
## Non-IT applications - Overview of Secure Power

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

<table>
<thead>
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</table>

### Transformerless UPS systems

- **NETYS RT-M**: 1.1 - 3.3 kVA, 1/1 - for marine applications
- **ITYS ES**: 1/1 - for electrical substations
## Non-IT applications - Overview of Secure Power solutions

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

### Industrial and Manufacturing processes

**MASTERYS IP+**
- Industrial rugged UPS for harsh environment
- Transformer-based UPS

**DELPHYS MP Elite+**
- Transformer-based UPS

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

### Transformerless UPS systems

**MASTERYS MC**
- Transformerless UPS system

**MASTERYS GP**
- Transformerless UPS system

**MASTERYS GP4**
- Transformerless UPS system

**DELPHYS GP**
- Transformerless UPS system

**MODULYS GP**
- Transformerless UPS system

**MODULYS RM GP**
- Transformerless UPS system

**DELPHYS XTEND GP**
- Transformerless UPS system

### Solutions for specific environments

**NETYS RT-M**
- Complementary solutions

**ITYS ES**
- Complementary solutions

---

### IT applications - Overview of Critical Power solutions

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

### Power Solutions by Capacity

<table>
<thead>
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<th>Capacity</th>
<th>Voltage Range</th>
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<td>10 - 40 kVA</td>
<td>24/48/108/120 V</td>
<td>15 to 200 A</td>
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<td>10 - 60 kVA</td>
<td>3/1</td>
<td></td>
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<td>10 - 80 kVA</td>
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<tr>
<td>10 - 60 kVA</td>
<td>3/1 &amp; 3/3</td>
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**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

MADE IN EUROPE

General Catalogue 2018-2019
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

**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**

**SMART BUILDINGS**
Reducing your energy bills and energy dependency

- **DIRIS Digiware AC & DC multi-circuit measurement system**
- **ENERGY MANAGEMENT software packages**
- **ATYS automatic and remotely operated transfer switches**
- **SUNSYS PCS² Power Conversion System and Storage**

**SHOPPING CENTRES**
Assuring business continuity and visitor safety

- **COUNTIS E energy meter and multi-utility pulse concentrator**
- **ATYS M automatic and remotely operated modular transfer switches**
- **MASTERYS BC+ UPS**
- **ENERGY MANAGEMENT software packages**

**PUBLIC DISTRIBUTION AND SMART GRID**
Helping you to meet the challenge of energy demand and response

- **SUNSYS PCS² Power Conversion System and Storage**
- **TIP low-voltage feeder pillar with DIRIS multifunction meter**
- **Auxiliary unit with ATYS transfer switch**
- **SIRCO and SIDER load break switches**
- **DIRIS Digiware AC & DC multi-circuit measurement system**

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

- **SUNSYS PCS² Power Conversion System and Storage**
- **NORDYS UBS DC load break switches with tripping function**
- **DIRIS Digiware DC multi-circuit measurement system**
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

Guaranteeing the performance, security and durability of your photovoltaic facilities

RENEWABLE ENERGY

SUNSYS PCS²

Power Conversion System and Storage

DIRIS Digiware AC

& DC multi-circuit measurement system

Helping you to meet the challenge of energy demand and response

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

DIRIS Digiware AC

& DC multi-circuit measurement system

Assuring your business continuity and visitor safety

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

INDUSTRY

Meeting the challenge of the availability and performance of your energy

HEAVY INDUSTRY

FUSERBLOC fuse combination switches

Safety enclosures with switch disconnector for standard and explosive environments

DIRIS Q800 network analyser

COUNTIS E energy meter and DIRIS A multifunction meter (PMD)

FUSERBLOC fuse combination switches

ATyS automatic and remotely operated transfer switches

MEDSYS medical IT cabinet

INDUSTRY

Ensuring the competitiveness of your site

MASTERYS IP+ UPS for harsh industrial environments

ENERGY MANAGEMENT software packages

Components for distribution enclosure with FUSERBLOC fuse-combination switches

MASTERYS GP4 UPS

ATyS automatic and remotely operated transfer switches

MASTERYS GP4 UPS

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.

UNDERSTANDING EXPERTISE PROXIMITY ADAPTATION OPTIMISATION MEASUREMENT AND ANALYSIS CONSULTANCY, DEPLOYMENT AND TRAINING PREVENTION AND SERVICE OPERATIONS
Expert Services your partner
enabling available, safe and efficient energy

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.

- 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

### 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 50 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.

### A certified organisation

#### Products

- [TÜV](https://www.tuv.com)
- [GS](https://www.globalsignature.com)
- [CE](https://www.cenelec.org)
- [SONEL](https://www.sonel.com)
- [ISO 9001](https://www.iso.org/iso-9000.html)
- [ISO 14001](https://www.iso.org/iso-14000.html)
- [EMS 553476](https://www.EMS553476.com)
- [BUREAU VERITAS](https://www.bureauveritas.com)
- [Gost (Russia)](https://www.gost.ru)
- [UL (USA)](https://www.ul.com)
- [TLC (China)](https://www.tlc.com)
- [Gost (Russia)](https://www.gost.ru)
- [UL (USA)](https://www.ul.com)
- [TLC (China)](https://www.tlc.com)

#### Local compliance

- [UL (USA)](https://www.ul.com)
- [Gost (Russia)](https://www.gost.ru)
- [TLC (China)](https://www.tlc.com)

#### Environment

- [PEP](https://www.pep.org)
- [EcoPassPort](https://www.ecopassport.org)
- [EUROPEAN ASSOCIATION](https://www.europeanassociation.com)
- [THE GREEN GRID](https://www.thegreengrid.org)

#### Industrial sites

- [afac](https://www.afac.org)
- [AIE](https://www.aie.org)
- [BPIE](https://www.bpie.org)
- [EnerTask](https://www.enertask.com)
Industrial sites
Local compliance
Products
Environment

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 50 years of experience.

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

ISO 9001
FM 28237
ISO14001
EMS 553476

BUREAU VERITAS

GAMME 008 AA
Gost (Russia)UL (USA) TLC (China)

Customer Service Excellence
2004
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

The focus on service
> Project consulting in design phases
> CIM worldwide organisation
> Audits & consulting

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

The know-how of a manufacturer
> A commitment to quality
> LEAN manufacturing
> The largest UPS manufacturing plant in Europe

Continuous innovation

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>1st UPS</td>
</tr>
<tr>
<td>1987</td>
<td>1st Static Transfer System (STS)</td>
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<tr>
<td>1988</td>
<td>Transistor technology (600 kVA)</td>
</tr>
<tr>
<td>1989</td>
<td>IGBT &amp; microprocessor</td>
</tr>
<tr>
<td>1990</td>
<td>Distributed parallel architecture</td>
</tr>
<tr>
<td>1994</td>
<td>Transformerless technology</td>
</tr>
<tr>
<td>1996</td>
<td>IGBT up to 800 kVA</td>
</tr>
<tr>
<td>1998</td>
<td>Digital Signal Processor (DSP)</td>
</tr>
<tr>
<td>2001</td>
<td>1st modular UPS</td>
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<tr>
<td>2003</td>
<td>IGBT rectifiers up to 200 kVA</td>
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<tr>
<td>2004</td>
<td>New battery charging design</td>
</tr>
<tr>
<td>2006</td>
<td>Dynamic Energy Storage System (Flywheel)</td>
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<tr>
<td>2008</td>
<td>High efficiency UPS</td>
</tr>
<tr>
<td>2010</td>
<td>Most compact 900 kVA UPS</td>
</tr>
<tr>
<td>2012</td>
<td>High power 3-level technology</td>
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<tr>
<td>2014</td>
<td>“Forever Young” design for modular UPS</td>
</tr>
<tr>
<td>2015</td>
<td>Real hot-scalable high power UPS system Rack-mounted modular UPS system</td>
</tr>
<tr>
<td>2017</td>
<td>MASTERYS: 4th generation digital native UPS</td>
</tr>
</tbody>
</table>

The vision of a specialist
> Solutions focused on customer applications
> Listening to customers’ requirements
> Experienced personnel

‘Best-in-class’ manufacturer
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 Power 2.0 UPS solutions from 10 kVA/kW to 2.4 MVA/MW
Green solution to reduce energy consumption and environmental impact 

Better products for sustainable applications

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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.

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

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- **NETYS PR** Mini Tower ........................................ p.22
- **ITYS E** ................................................................ p.34
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19" Rack & Rack/Tower convertible UPS

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- **NETYS PR** Rack 1U ............................................ p.26
- **NETYS RT** ........................................................ p.28
- **NETYS RT-M** ..................................................... p.32
- **MODULYS RM GP** ........................................... p.66

Single unit & 1+1 configuration UPS

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Single & parallel UPS systems

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- **MASTERYS GP4** .............................................. p.52
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- **MASTERYS MC** ............................................... p.70
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Modular & scalable UPS systems

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- **MODULYS GP** ................................................ p.60
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**NON-IT APPLICATION SOLUTIONS**

Industrial rugged UPS for harsh environment

- **MASTERYS IP+** ................................................ p.72

UPS with transformer for industrial processes

- **MASTERYS IP** ................................................ p.74

Transformer-based UPS

- **DELPHYS MP Elite+** ........................................ p.76
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Industrial modular DC power

- **SHARYS IP** ..................................................... p.80
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 output 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.

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

- IEC 62040-2, AS 62040.2
- IEC 62040-1, AS 62040.1.1, AS 62040.1.2
- IS 16242 (Part 1)/41030651
- Australian standard
- Indian standard (BIS compliant)

Output connections

- IEC socket 320 (C13)
- Australian standard
- Indian standard (BIS compliant)

Some models may not be available in your country – please check with your local sales office.
Some models may not be available in your country – please check with your local sales office.

A solution for network power

- Easy to use
- Applications
- Protection for SOHO or POS
- Ideal and cost-effective

The integrated AVR function (Automatic Voltage Regulation) stabilizes the output voltage and avoids the switching to Battery Mode operation, therefore saving the back-up time.

- Single-phase UPS
- 600 / 650 / 850 VA
- 1000 VA
- 1500 / 2000 VA

Practical and cost-effective protection

- NETYS PE
- From 600 to 2000 VA

Adapted to protect IT applications in home, office and retail environments.

- 600 / 650 / 850 VA
- 1000 / 1500 / 2000 VA
- 1500 / 2000 VA

• Integrated NTP protection for LAN/ADSL
• Several output sockets (IT standard) simplify connection against the risk of data line overvoltage.
• LCD / LEDs allowing the operating mode to be easily monitored.
• Simplified connection
• Integrated NTP data line suppressor
• Voltage tolerance
• 230 V ±10% and 140 - 300 V (Indian standard)

Technical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>NETYS PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn (VA)</td>
<td>600 650 850 1000 1500 2000</td>
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<tr>
<td>Pn (W)</td>
<td>360 360 480 600 900 1200</td>
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<tr>
<td>Input/output</td>
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<td>INPUT</td>
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<tr>
<td>Rated voltage (Battery Mode)</td>
<td>230 V</td>
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<td>Voltage tolerance</td>
<td>170 - 280 V (IEC and Australian standards), 140 - 300 V (Indian standard)</td>
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<tr>
<td>Rated frequency</td>
<td>50/60 Hz with automatic selection</td>
</tr>
<tr>
<td>Mains connection</td>
<td>IEC320 socket (IEC and Australian standards), cable with plug (Indian standard)</td>
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<tr>
<td>OUTPUT</td>
<td></td>
</tr>
<tr>
<td>Automatic Voltage Regulation (AVR)</td>
<td>• • • • • • •</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>230 V ±10%</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz ±1%</td>
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<tr>
<td>Wave form</td>
<td>Step wave</td>
</tr>
<tr>
<td>Protection</td>
<td>Overload, significant discharge and short circuit</td>
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<td>CONNECTIONS</td>
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<tr>
<td>IEC standard</td>
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<td>Australian standard</td>
<td>2 sockets</td>
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<td>Indian standard</td>
<td>3 sockets</td>
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<td>UPS CABINET</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Sealed lead-acid maintenance free - expected life 3/5 years</td>
</tr>
<tr>
<td>Back-up time (t)</td>
<td>15 min 15 min 20 min 45 min 55 min 60 min</td>
</tr>
<tr>
<td>COMMUNICATION</td>
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<tr>
<td>Interfaces</td>
<td>USB</td>
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<tr>
<td>Local communication software</td>
<td>Local View</td>
</tr>
<tr>
<td>Data Line protection</td>
<td>NTP data line suppressor</td>
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<tr>
<td>UPS CABINET</td>
<td></td>
</tr>
<tr>
<td>Dimensions W x D x H</td>
<td>100 x 300 x 145 mm 145 x 345 x 165 mm 145 x 390 x 205 mm</td>
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<tr>
<td>Weight</td>
<td>5.0 kg 5.2 kg 6.0 kg 9.7 kg 11.2 kg 12.2 kg</td>
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<td>ECEN 62040-2, AS 62040.2</td>
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<td>CE, ROM (E3378)</td>
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<tr>
<td>BS certification</td>
<td>R-4103651</td>
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</table>

(t) 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.
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 sinewave 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.

Some models may not be available in your country – please check with your local sales office.
Single-phase UPS
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

NETYS PR
1000 VA
NETYS PR
1500 / 2000 VA
Professional line interactive UPS
• Ideal solution for protecting small servers and high performance CAD or graphic workstations.
• Assures service continuity to critical applications.
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Easy to use
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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.

Certifications
RoHS COMPLIANT
Some models may not be available in your country – please check with your local sales office.

NETYS PR
Single-phase UPS from 1000 to 2000 VA - Mini Tower

Technical data

NETYS PR Mini Tower

<table>
<thead>
<tr>
<th>Sn</th>
<th>1000 VA</th>
<th>1500 VA</th>
<th>2000 VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn</td>
<td>700 W</td>
<td>1050 W</td>
<td>1400 W</td>
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<table>
<thead>
<tr>
<th>INPUT</th>
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<tbody>
<tr>
<td>Rated voltage</td>
</tr>
<tr>
<td>Voltage tolerance</td>
</tr>
<tr>
<td>Rated frequency</td>
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<tr>
<td>Mains connection</td>
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</table>

<table>
<thead>
<tr>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic Voltage Regulation (AVR)</td>
</tr>
<tr>
<td>Rated voltage</td>
</tr>
<tr>
<td>Rated frequency</td>
</tr>
<tr>
<td>Wave form</td>
</tr>
<tr>
<td>Protection</td>
</tr>
<tr>
<td>Connections</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BATTERIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Back-up time (1)</td>
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<table>
<thead>
<tr>
<th>COMMUNICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interfaces</td>
</tr>
<tr>
<td>Local communication software</td>
</tr>
<tr>
<td>Data Line protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UPS CABINET</th>
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</thead>
<tbody>
<tr>
<td>Dimensions W x D x H</td>
</tr>
<tr>
<td>Weight</td>
</tr>
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<table>
<thead>
<tr>
<th>STANDARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
</tr>
<tr>
<td>EMC</td>
</tr>
<tr>
<td>Product declaration</td>
</tr>
</tbody>
</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.
**NETYS PR**

High performance protection on rack or tower from 1700 to 3300 VA - Rack/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

---

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 sine wave 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.

---

*Some models may not be available in your country – please check with your local sales office.*
Some models may not be available in your country – please check with your local sales office.

Simple to install

Tailored to IT networking

supply continuity

A secure and professional

Integrated nTP protection for LAN/ADs

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Attractive design for visible installation in

Compact footprint (2U/89 mm) for

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Designed for professional applications:

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assures service continuity to critical

Ideal solution for protecting small servers, applications.

Single-phase UPS

overvoltage.

connection against the risk of data line

direct interfacing with Windows® systems,

offices.

the user's needs.

standard 19” rack cabinets depending on

conversion option means it can be installed

power supply.

full compatibility with any kind of load and

the sine wave inverter technology assures

applications.

software.

without the need for additional specialist

remote shutdown of applications.

management of the power supply and local/

loads and manage critical situations.

(1) @ 75% of load.

Technical data

NETYS PR Rack/Tower

Sr 1700 VA 2200 VA 3300 VA

Ph 1350 W 1800 W 2700 W

Input/output 1/1

INPUT

Rated voltage 230 V

Voltage tolerance 161 V ±4% (selecting wide mode) - 276 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) the output voltage by 14% when the input voltage drops below 80% 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

Wave form Sinewave

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 1 (16 A) x IEC 320

BATTERIES

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

Back-up time (1) 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: RJ45 10 Base T

UPS CABINET

Dimensions W x D x H 440 x 436 x 87 mm 440 x 608 x 87 mm

Weight 18 kg 28.2 kg 31.5 kg

STANDARDS

Safety IEC/EN 62040-1, AS 62040.1, AS 62040.1.2

EMC IEC/EN 62040-2, AS 62040.2

Product declaration CE, RCM [2376]

(1) @ 75% of load.

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 + 1 [NPR-B1700-RT] + 2 [NPR-B1700-RT]

1700 VA 22 min 42 min

NETYS PR + 1 [NPR-B2200-RT] + 2 [NPR-B2200-RT]

2200 VA 37 min 72 min

3300 VA 22 min 43 min

General Catalogue 2018-2019 25
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

Output connections
• IEC socket 320 (C13)
• Australian standard

Some models may not be available in your country – please check with your local sales office.
NETYS PR Rack 1U

**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>Model</th>
<th>1000 VA</th>
<th>1500 VA</th>
</tr>
</thead>
<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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<td>INPUT</td>
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<td>Rated frequency</td>
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<tr>
<td>Rated voltage</td>
<td>230 V</td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</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>CONNECTION</td>
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<td>IEC standard</td>
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<td>BATTERIES</td>
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</tr>
<tr>
<td>Type</td>
<td>Sealed lead-acid maintenance free - expected life 3/5 years</td>
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<tr>
<td>Back-up time</td>
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<td>Local communication software</td>
<td>Local View</td>
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<tr>
<td>UPS CABINET</td>
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<tr>
<td>Dimensions W x D x H</td>
<td>440 x 578 x 44.5 mm</td>
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<td>SE, RCM (E2276)</td>
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</table>

1. Slot for optional communication boards
2. Test / Alarm reset button
3. Power ON
4. Overload
5. Battery mode
6. Service
7. Load segment 2
8. Load segment 1

**Included**
- Mounting bracket for 19" rack
- 4 x IEC 320 (10 A)
- Assembly Wing Nuts
- Wing nut for front Hold-down bracket

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

**Connections**

1. Slot for optional communication boards
2. Test / Alarm reset button
3. Power ON
4. Overload
5. Battery mode
6. Service
7. Load segment 2
8. Load segment 1

1. Rear Hold-Down Bracket
2. Rail assembly
3. Assembly Wing Nuts
4. Wing nut for rear Hold-down bracket
**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 swichovers 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

**Certifications**
- TÜV GS
- RoHS
- IEC 320-C14 (10 A) IEC 320-C20 (16 A) terminals

**Advantages**
- VFI “online double conversion”
- Portable multiple German standard outlets
- Hot-swap manual bypass (1100-3300 VA)
- Battery extension modules.
- Connection for battery extension modules.
- RJ11 connection for Emergency Power Off

---

Some models may not be available in your country – please check with your local sales office.
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).

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.

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>NETYS RT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn</td>
<td>1100 VA</td>
</tr>
<tr>
<td>Pn</td>
<td>900 W</td>
</tr>
<tr>
<td>Architecture</td>
<td>online double conversion VFI with input PFC and automatic bypass</td>
</tr>
<tr>
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<td>-</td>
</tr>
<tr>
<td>INPUT</td>
<td>Voltage</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz +/-10% (Auto-Selectible)</td>
</tr>
<tr>
<td>Power factor / THDi</td>
<td>&gt;0.99 &lt;5%</td>
</tr>
<tr>
<td>Input socket</td>
<td>IEC 320-C14 (10 A)</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>Voltage</td>
</tr>
<tr>
<td>Power factor</td>
<td>0.9 @ 1000 VA</td>
</tr>
<tr>
<td>Efficiency</td>
<td>up to 93% online mode</td>
</tr>
<tr>
<td>Overload capability</td>
<td>up to 105% continuously; 125% x 3 min; 150% x 30 sec</td>
</tr>
<tr>
<td>Output connections</td>
<td>6 x IEC 320-C13 (10 A)</td>
</tr>
<tr>
<td>BATTERY</td>
<td>Voltage</td>
</tr>
<tr>
<td>Recharge time</td>
<td>&lt; 3 hr to recover 90% capacity</td>
</tr>
<tr>
<td>COMMUNICATION</td>
<td>Mimic panel</td>
</tr>
<tr>
<td>RS323 MODBUS protocol</td>
<td>•</td>
</tr>
<tr>
<td>USB HID protocol</td>
<td>•</td>
</tr>
<tr>
<td>WEB/SNMP (Ethernet RJ45 port)</td>
<td>option</td>
</tr>
<tr>
<td>COMM slot</td>
<td>•</td>
</tr>
<tr>
<td>Dry contacts card</td>
<td>option</td>
</tr>
<tr>
<td>EPO input (RJ11 port)</td>
<td>•</td>
</tr>
<tr>
<td>Parallel port</td>
<td>-</td>
</tr>
<tr>
<td>STANDARDS</td>
<td>Safety</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 (efficiency tested by an external independent body)</td>
</tr>
<tr>
<td>Product declaration</td>
<td>CE, RCM (E2376)</td>
</tr>
<tr>
<td>BIS certification</td>
<td>-</td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td>Operating ambient temperature</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>from -15 °C to +50 °C (from 15 °C to 25 °C for best battery life)</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>5-95% non-condensing</td>
</tr>
<tr>
<td>Noise level (ISO 3746)</td>
<td>&lt;45 dB(A)</td>
</tr>
<tr>
<td>UPS CABINET</td>
<td>UPS size std (W x D x H)</td>
</tr>
<tr>
<td>UPS size rack (W x D x H)</td>
<td>2U</td>
</tr>
<tr>
<td>UPS weight std</td>
<td>13 kg</td>
</tr>
<tr>
<td>IP rating</td>
<td>IP20</td>
</tr>
<tr>
<td>EBM module size std (W x D x H)</td>
<td>89x340x440 mm</td>
</tr>
<tr>
<td>EBM module Rack (W x D x H)</td>
<td>2U</td>
</tr>
<tr>
<td>EBM module weight</td>
<td>16 kg</td>
</tr>
</tbody>
</table>

(1) @75% of rated load PF 0.7.
**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)
**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-U1100</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-U1100</td>
<td>1 x NRT-B1100</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U1100</td>
<td>2 x NRT-B1100</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U1700</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-U1700</td>
<td>1 x NRT-B2200</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U1700</td>
<td>2 x NRT-B2200</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U2200</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-U2200</td>
<td>1 x NRT-B2200</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U3300</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-U3300</td>
<td>1 x NRT-B3300</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
<tr>
<td>NRT2-U3300</td>
<td>2 x NRT-B3300</td>
<td>10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170</td>
</tr>
</tbody>
</table>

- 50% of rated load PF 0.7
- 75% of rated load PF 0.7
- 100% of rated load PF 0.7

**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 reducndancy.

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.

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).

The solution for
> Steering systems
> Bridge systems
> Radar systems
> Control systems
> Video surveillance systems

Certifications

Some models may not be available in your country – please check with your local sales office.
Some models may not be available in your country – please check with your local sales office.

Easy to use

UPS DNV GL standard certified.

introduced NETYS RT-M, high-performance efficiency and reduce costs, SOCOMEC has solutions to ensure availability, improve energy company’s commitment to develop innovative leads to costs increasing. In line with the communication and engine controls, which extremely serious problems to critical applications operating in harsh environments.

The marine industry calls for reliable high availability in marine

• Wide range of communication protocols
• No configuration necessary on first startup.

NETYS RT-M from 1100 to 3300 VA

NETYS RT-M

• Online double conversion VFI with input PFC and automatic bypass

BATTERY

Standard autonomy(1) 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

COMM slots 1 available as standard

Dry contacts card option

EPO input RJ11 port

ENVIRONMENT

Operating ambient temperature from 0 °C up to +40 °C (from 15 °C to 25 °C for maximum battery life) 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 698 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 698 x 440 mm

Dimensions RACK U 2U

Weight 16 kg 29 kg 43 kg

STANDARDS

Safety IECEN 62040-1, AS 62040.1.1, AS 62040.1.2

EMC IECEN 62040-2, AS 62040.2

Performance IEC(62040-3 efficiency tested by an external independent body)


(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 (flashing)
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.
**ITYS E**

Affordable and reliable protection from 1 to 10 kVA

Best electrical protection
- True online double conversion technology (VFI) assures high availability and total load protection.
- Constant output voltage and frequency regulation makes ITYS E compatible with different applications, operating environments and GenSets.
- 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 sockets or terminals.
- Wide input voltage tolerance limits the switchovers to battery mode prolonging the battery life.
- Manual bypass for periodic or emergency maintenance.

The solution for
- Professional workstations
- Industrial automation
- Security systems
- Telecom systems
- Banking ATM systems

Technology
- VFI “online double conversion”

Certifications
- BIS certification

Output connections
- IEC socket 320 (C13)
- Universal socket
- Indian standard (BIS compliant)

Some models may not be available in your country – please check with your local sales office.
**Connections**

1. **USB serial port**
2. **RS232 serial port**
3. **Slot for optional boards**
4. **Output sockets**
5. **Output terminals**
6. **Input protection**
7. **Input socket**
8. **External battery connection**
9. **EPO (Emergency Power Off)**
10. **Manual bypass**
11. **Input circuit breaker**

### Technical data

**ITYS E**

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>230 V (1ph) 160÷300 V up to 110 V @ 60% load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated frequency (Hz)</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Power factor</td>
<td>0.99</td>
</tr>
</tbody>
</table>

**INPUT**

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>230/220/230/240 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage tolerance</td>
<td>± 1%</td>
</tr>
<tr>
<td>Rated frequency (Hz)</td>
<td>50/60 Hz (46÷54 Hz / 56÷64 Hz) (in battery mode 50/60 ± 0.1 Hz)</td>
</tr>
<tr>
<td>Overload</td>
<td>Up to 130% for 1 minute</td>
</tr>
<tr>
<td>Crest factor</td>
<td>3:1</td>
</tr>
</tbody>
</table>

**OUTPUT**

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>230 V (1ph) 160÷300 V up to 110 V @ 60% load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage (V)</td>
<td>298 V</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 1%</td>
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<tr>
<td>Rated frequency (Hz)</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Overload</td>
<td>Up to 130% for 1 minute</td>
</tr>
<tr>
<td>Crest factor</td>
<td>3:1</td>
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</table>

**BATTERIES**

<table>
<thead>
<tr>
<th>Type</th>
<th>sealed lead-acid maintenance free - expected life 3/5 years</th>
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<tbody>
<tr>
<td>Back-up time @75% of rated VA load (hr)</td>
<td>8 min</td>
</tr>
<tr>
<td>Voltage (VDC)</td>
<td>36, 96, 192, 240</td>
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</table>

**BATTERY CHARGER**

<table>
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<tr>
<th>Setting up to 8 A</th>
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</table>

**COMMUNICATION**

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<th>RS232 - USB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local communication software</td>
<td>LOCAL VIEW</td>
</tr>
</tbody>
</table>

**EFFICIENCY**

| Online mode | up to 90% |

**ENVIRONMENT**

| Ambient temperature | 0 to 40°C (15 to 25 °C for maximum battery life) |
| Relative humidity | 0 to 95% without condensation |
| Maximum altitude | 1000 m without derating |
| Noise level at 1 m | < 55 dBA |

**UPS CABINET**

| Dimensions (W x D x H) (mm) | 145 x 285 x 220 |
| Weight (kg) | 10 |
| Voltage (VDC) | 36 |

**COMMUNICATION**

<table>
<thead>
<tr>
<th>Interfaces</th>
<th>LOCAL VIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication options</td>
<td>- USB</td>
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**Safety**

<table>
<thead>
<tr>
<th>Certification</th>
<th>CE</th>
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<tr>
<td>Product declaration</td>
<td>EN 62040-1, EN 62040-2</td>
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<tr>
<td>Safety (IEC)</td>
<td>EN 62040-1, EN 62040-2</td>
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<tr>
<td>EMC (IEC)</td>
<td>EN 62040-1, EN 62040-2</td>
</tr>
<tr>
<td>BIS certification</td>
<td>R-41030651</td>
</tr>
</tbody>
</table>

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**Standards**

1. **Models with internal batteries.**
2. **Models without batteries.**
3. **Models with IEC output sockets.**
ITYS

Reliable and versatile power protection from 1 to 20 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

Autonomy configurations
- Flexible autonomy
- Extendable autonomy
- Long autonomy

Some models may not be available in your country – please check with your local sales office.
Some models may not be available in your country – please check with your local sales office.

Robust and versatile

High protection and availability

Manual bypass for periodic or emergency

Easy connections via IEC 320 sockets or

Compact tower UPS system saves space in

Automatic bypass supplies the loads in the

Constant output voltage and frequency

•

•

switchovers to battery mode prolonging the
terminals.

providing supply continuity during long
external high capacity batteries, therefore
installation.

limitless increases in autonomy, even after
the load to be supplied.

variety of power back-up times according to
continuity in the event of an outage.

all ITYS models to ensure power supply

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Reliable and versatile power protection

ITYS from 1 to 20 kVA

Wide battery configurability

•

Modular battery extension enables

•

Modular battery extension meets a wide
variety of power back-up times according to
continuity in the event of an outage.

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).
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.
Continuous protection
Total protection
MODULYS adapts easily to changes and to upgradable over time.

MODULYS has "hot swap" power and MODULYS is a modular UPS. The number of Mod-Power and Mod-Battery units can be increased and additional guarantee since the load will be powered even if one of the modules is not operational.

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

VFI "online double conversion"

GAMME 237 B

An adaptable system
- 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.

General Catalogue 2018-2019
**ITYS PRO**

Reliable cost-effective power protection from 10 to 20 kVA

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.
- 1+1 parallel configuration for 10 kVA and 20 kVA type S models with dual input mains.
- Innovative battery management extending battery life (virtually ZERO ripple on batteries).
- Redundant bypass protection reducing the risk of power cuts.
- Integrated LAN network monitoring via web browser, Multilanguage display.

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.
- Up to 3 battery chargers for very long back-up time requirements.
- Models with internal isolation transformer and IP31 degree of protection.
- IP31 degree of protection available on request for transformerless models.
- Low electromagnetic emissions compliant for commercial installations.
- Embedded redundancy on the bypass control and power supply to minimise any risk of interrupting the load.
- A single 25-block battery string simplifies the connection and reduces both the overall cost and the space required.

Some models may not be available in your country – please check with your local sales office.
Standard electrical and mechanical features

- Dual input mains (3/1 models).
- Internal maintenance bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.
- IP31 degree of protection (models with transformer).

Electrical and mechanical options

- Dual input mains (3/3 models).
- External battery cabinet.
- Additional battery chargers.
- IP31 degree of protection (models without transformer).

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>kW</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type M</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>15</td>
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<tr>
<td></td>
<td>30</td>
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<td>50</td>
<td>30</td>
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<tr>
<td></td>
<td>60</td>
<td>40</td>
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<tr>
<td></td>
<td>80</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>Type T</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>10</td>
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<td></td>
<td>60</td>
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</tr>
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<td></td>
<td>80</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>60</td>
</tr>
</tbody>
</table>

(1) Operating with typical load.

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).

Technical data

<table>
<thead>
<tr>
<th>UPS with external batteries</th>
<th>kW</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITYS PRO battery cabinet</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Other battery cabinet with 25 blocks x 42 Ah</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>

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

Dangerous installations: refer to UL62040-1, AS 62040.1.1, AS 62040.1.2
**MASTERYS BC**
Reliable, simple and ready-to-use power protection from 15 to 40 kVA

**The ideal protection**
- Simple and reliable power protection.
- Tailored for medium-sized businesses.
- Advantages of advanced technology.

**An excellent size/power/backup time ratio**
- Ideal for sensitive professional applications.
- Suitable for protection in IT environments thanks to the internal back-up time and the possibility of installation in 19" rack cabinets.

**Tailored to your environment**
- Easy to install.
- Unique to the market with its highly compact size.
- Flexible back-up times: different back-up time configurations are available either within the UPS standard cabinet or by using taller UPS cabinets, without changing the floor space (W = 444, D = 795 mm).
- Increased system availability placing two UPS in parallel.
- Fitted with a multilanguage LCD display.
- Separate rectifier supply and bypass networks.

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

**Technology**
- VFI "online double conversion"

**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

Some models may not be available in your country – please check with your local sales office.
Standard electrical features
- Dual input mains (3/1 models).
- Internal manual bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.

Electrical options
- Dual input mains (3/3 models).
- External battery cabinet.
- External temperature sensor.
- Additional battery chargers.
- 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>MASTEYS BC</th>
<th>UPS In/Out kVA</th>
<th>Back-up time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>30</td>
<td>40</td>
<td>30</td>
</tr>
</tbody>
</table>

UPS and internal batteries

<table>
<thead>
<tr>
<th>UPS and Internal Batteries</th>
<th>Sn [kVA]</th>
<th>Input/output</th>
<th>Parallel configuration</th>
<th>Cabling options</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 115</td>
<td>15</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>240 kg</td>
</tr>
<tr>
<td>BC 150</td>
<td>15</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>260 kg</td>
</tr>
<tr>
<td>BC 310</td>
<td>15</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>415 kg</td>
</tr>
<tr>
<td>BC 315</td>
<td>15</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>415 kg</td>
</tr>
<tr>
<td>BC 310</td>
<td>15</td>
<td>3/1</td>
<td>up to 2 units</td>
<td>240 kg</td>
</tr>
<tr>
<td>BC 315</td>
<td>15</td>
<td>3/1</td>
<td>up to 2 units</td>
<td>260 kg</td>
</tr>
<tr>
<td>BC 310</td>
<td>20</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>240 kg</td>
</tr>
<tr>
<td>BC 315</td>
<td>20</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>260 kg</td>
</tr>
<tr>
<td>BC 310</td>
<td>20</td>
<td>3/1</td>
<td>up to 2 units</td>
<td>240 kg</td>
</tr>
<tr>
<td>BC 315</td>
<td>20</td>
<td>3/1</td>
<td>up to 2 units</td>
<td>260 kg</td>
</tr>
<tr>
<td>BC 310</td>
<td>30</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>240 kg</td>
</tr>
<tr>
<td>BC 315</td>
<td>30</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>260 kg</td>
</tr>
<tr>
<td>BC 310</td>
<td>30</td>
<td>3/1</td>
<td>up to 2 units</td>
<td>240 kg</td>
</tr>
<tr>
<td>BC 315</td>
<td>30</td>
<td>3/1</td>
<td>up to 2 units</td>
<td>260 kg</td>
</tr>
<tr>
<td>BC 310</td>
<td>40</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>240 kg</td>
</tr>
<tr>
<td>BC 315</td>
<td>40</td>
<td>3/3</td>
<td>up to 2 units</td>
<td>260 kg</td>
</tr>
<tr>
<td>BC 310</td>
<td>40</td>
<td>3/1</td>
<td>up to 2 units</td>
<td>240 kg</td>
</tr>
<tr>
<td>BC 315</td>
<td>40</td>
<td>3/1</td>
<td>up to 2 units</td>
<td>260 kg</td>
</tr>
</tbody>
</table>

(1) @ Pout = 90 % Pnom.
MASTERYS BC
Reliable, simple and ready-to-use power protection from 60 to 80 kVA

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.
- 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"

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

Standard electrical features
- Internal manual bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.

Electrical options
- Dual input mains.
- 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.

Some models may not be available in your country – please check with your local sales office.
Three-phase UPS
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.
• 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.

MASTERYS BC
Reliable, simple and ready-to-use power protection from 60 to 80 kVA

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

VFI “online double conversion”

Some models may not be available in your country—please check with your local sales office.

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

Technical data

<table>
<thead>
<tr>
<th>Masterys BC</th>
<th>60</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>sn (kVA)</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>Pn (kW)</td>
<td>54</td>
<td>72</td>
</tr>
<tr>
<td>Input/output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallel configuration</td>
<td>1+1(1)</td>
<td></td>
</tr>
<tr>
<td>INPUT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>400 V 3p+N</td>
<td></td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>240 V to 480 V(2)</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>
<td></td>
</tr>
<tr>
<td>OUTPUT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>1ph + N: 230 V (can be configured 220/240 V)</td>
<td></td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>static load ±1 % dynamic load in accordance with VFI-SS-111</td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>± 2% (configurable from 1% to 8%)</td>
<td></td>
</tr>
<tr>
<td>Overload</td>
<td>125% for 10 minutes, 150% for 1 minute</td>
<td></td>
</tr>
<tr>
<td>Crest factor</td>
<td>3:1</td>
<td></td>
</tr>
<tr>
<td>BYPASS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>rated output voltage</td>
<td></td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 15% (configurable with from 10% to 20%)</td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>± 2% (configurable for Genset compatibility)</td>
<td></td>
</tr>
<tr>
<td>EFFICIENCY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online mode @ 100% of load</td>
<td>up to 94.5%</td>
<td></td>
</tr>
<tr>
<td>ENVIRONMENT</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>
</tr>
<tr>
<td>Relative humidity</td>
<td>0% - 95% without condensation</td>
<td></td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>1000 m without derating (max. 3000 m)</td>
<td></td>
</tr>
<tr>
<td>Acoustic level at 1 m (ISO 3746)</td>
<td>&lt; 62 dBA</td>
<td></td>
</tr>
<tr>
<td>UPS CABINET</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions W x D x H</td>
<td>444 x 795 x 1400 mm</td>
<td></td>
</tr>
<tr>
<td>Weight(3)</td>
<td>180 kg</td>
<td>200 kg</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
<td></td>
</tr>
<tr>
<td>Colours</td>
<td>RAL 7012</td>
<td></td>
</tr>
<tr>
<td>STANDARDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2</td>
<td></td>
</tr>
<tr>
<td>EMC</td>
<td>IEC/EN 62040-2, AS 62040.2</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>IEC/EN 62040-3, AS 62040.3</td>
<td></td>
</tr>
<tr>
<td>Product declaration</td>
<td>CE, RCM (E2376)</td>
<td></td>
</tr>
</tbody>
</table>

(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.
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.

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

Certifications

- TUV - IEC 62040-1
- RoHS

The solution for

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

Features

- Dual input mains
- Online double conversion mode up to 95%
- Frequency tolerance ± 2%
- Voltage tolerance ± 15% (configurable with from 10% to 20%)
- Crest factor 3:1
- Overload 125% for 10 minutes, 150% for 1 minute
- Total output voltage distortion < 1%
- Frequency tolerance ± 2% (configurable for GenSet compatibility)
- Rated frequency 50/60 Hz
- Rated voltage 3ph+N: 400 V (can be configured 380/415 V)
- Voltage tolerance 240 V to 480 V
- Rated voltage 400 V 3ph+N (3 wire input also available on demand)
- Parallel configuration up to 6 units
- Input / output 3/3
- Pn [kW] 90 108 144
- Sn [kVA] 100 120 160
- Weight 220 kg 232 kg 340 kg

Standards

- UPS CABINET
- Bypass
- Output

System features

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

- Communication options
  - Ethernet gateway for clould services.
  - NET VISION: professional WEB/SNMP,
    - BACnet/IP interface.
  - MODBUS TCP.
  - Dry-contact, RS232/485 interfaces.

- Alternative backup power technologies:
  - LINK-UPS, remote monitoring service which connects your UPS to your Critical Power specialist 24/7.
  - NET VISION: professional WEB/SNMP,
    - BACnet/IP interface.
  - MODBUS TCP.
  - Dry-contact, RS232/485 interfaces.

- Top cabling kit.
- TN-C grounding system.
- Common mains coupling bars.
- Internal backfeed isolation device.
- 3-phase input without neutral.

- Seismic fixing kit.
- ACS synchronisation system.
- IP21 degree of protection.
- Internal backfeed isolation device.
- 3-phase input without neutral.

- Alternative backup power technologies:
  - LINK-UPS, remote monitoring service which connects your UPS to your Critical Power specialist 24/7.
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    - BACnet/IP interface.
  - MODBUS TCP.
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- Internal backfeed isolation device.
- 3-phase input without neutral.

- Alternative backup power technologies:
  - LINK-UPS, remote monitoring service which connects your UPS to your Critical Power specialist 24/7.
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>Component</th>
<th>MASTERYS BC+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size [kVA]</td>
<td>100 120 160</td>
</tr>
<tr>
<td>Power [kW]</td>
<td>90 108 144</td>
</tr>
<tr>
<td>Input/output</td>
<td>3/3</td>
</tr>
<tr>
<td>Parallel config</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: 240 V to 430 V
- Rated frequency: 50/60 Hz ± 10%

OUTPUT

- Power factor: 0.9 (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% (configurable for GenSet compatibility)
- Total output voltage distortion: ≤ 1%
- Overload: 125% for 10 minutes, 150% for 1 minute
- Crest factor: 3:1

BYPASS

- Rated voltage: rated output voltage
- Voltage tolerance: ± 15% (configurable with from 10% to 20%)

EFFICIENCY

- Always on mode: up to 99%
- Double conversion mode: up to 99%

ENVIRONMENT

- Operating ambient temperature: from 0 °C to +35 °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: < 65 dBA

UPS CABINET

- Dimensions: W 600 mm  D 855 mm  H 1400 mm  1930 mm
- Weight: 220 kg  232 kg  340 kg
- Degree of protection: IP20
- Colours: Metallic Grey E150HVR

STANDARDS

- Safety EMC: IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
- Performance: IEC/EN 62040-3, AS 62040.3
- Environmental: full compliance with the RoHS EU directive
- Seismic compliance: on demand, in accordance with the Uniform Building Code UBC-1997 Zone 4
- Product declaration: CE, RCM (E2376)

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 sevices.

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

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 (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.
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.

Technical data

| DELPHYS BC |
|-----------------|-----------------|-----------------|
| **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
- 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 at 100% of load: up to 95% (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 / 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.
MASTERYS GP
High-efficiency protection without compromise
Green Power 2.0 range from 10 to 40 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 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
- Healthcare sector
- Telecommunications
- Service sector
- Infrastructure
- Industrial applications

Certifications

- STANDARDS
- IEC/EN 62040-3, AS 62040.3
- IEC/EN 62040-2, AS 62040.2
- IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2

- EMC
- IEC/EN 62040-1
- IEC/EN 62040-2

- Power factor
- 1 (according to IEC/EN 62040-3)

- EFFICIENCY (TÜV SÜD verified)
- Famous-Gold-TÜV-Standard (EN 62040-1).

- BYPASS
- EBS (Expert Battery System) charging management.

Output

- Maximum altitude 1000 m without derating (max. 3000 m)
- Relative humidity 0% - 95% without condensation
- Frequency tolerance ± 2%
- Rated frequency ± 15% (configurable from 10% to 20%)
- Voltage tolerance
  - Rated voltage 1ph + N: 230 V (can be configured 220/240 V)
  - Rated voltage 400 V 3ph+N
- Crest factor 3:1
- Total output voltage distortion
- Non-linear load: < 1%
- Linear load: < 1%
- Frequency tolerance ± 2% (configurable for GenSet compatibility)
- 50/60 Hz
- Rated frequency static load ±1 %
- dynamic load in accordance with VFI-SS-111
- Voltage tolerance 240 V to 480 V (1)
- Rated voltage 3ph+N: 400 V (can be configured 380/415 V)
- Power factor / THDI > 0.99 / < 2.5%
- 50/60 Hz ± 10%
- Rated frequency
- Standard electrical features
- Battery temperature sensor.
- Backfeed protection: detection circuit.
- Internal maintenance bypass.
- Dual input mains.
- UPS CABINET
- OVERLOAD
- 125% for 10 minutes, 150% for 1 minute

Advantages

- 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.

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.
- 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>Feature</th>
<th>Sn [kVA]</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>40</th>
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<td>400 V 3ph+N</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Voltage tolerance</td>
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<td>240 V to 480 V (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
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<td>50/60 Hz ± 10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power factor / THDI</td>
<td></td>
<td>&gt; 0.99/ &lt; 2.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### INPUT
- Power factor
- Rated voltage: 1 ph + N: 230 V (can be configured 220/240 V)
- Voltage tolerance: ±1 % dynamic load in accordance with VFI-SS-111
- Rated frequency: 50/60 Hz
- Frequency tolerance: ± 2% (configurable for GenSet compatibility)
- Total output voltage distortion:
  - Linear load: < 1%
  - Non-linear load: < 3%
- Overload: 125% for 10 minutes, 150% for 1 minute (1)
- 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%

#### EFFICIENCY (TÜV SÜD verified)
- Online mode @ 50% of load: up to 96%
- Online mode @ 75% of load: up to 96%
- Online mode @ 100% of load: up to 96%
- Eco Mode: up to 96%

#### 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): < 52 dBA

#### UPS CABINET
- Dimensions: W 444 mm, D 795 mm, H 800 mm to 1400 mm
- Weight: 190 kg to 320 kg
- Degree of protection: IP20
- 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
- Seismic compliance: On demand according to Uniform Building Code UBC-1997 Zone 4
- Product declaration: CE, RCM (E23796)

---

(1) Conditions apply.
**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
- 0 = 300,000 hours,
  - MTBF
+ = 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.

Certifications

- The MASTERYS GP4 series is certified by TÜV SÜD with regard to product safety (EN 62040-1).
- Seismic resistant The MASTERYS GP4 units have successfully passed severe tests to verify their resistance to withstand Zone 4 seismic events.

Advantages

- Mission Critical
  - Small and medium data centres
  - IT infrastructure
  - E-Medical
  - Medical devices
  - Control rooms

- Smart manufacturing
  - Edge computing
  - IoT systems
  - Cloud service access

A tutoring app for a simplified installation

- Augmented Reality technology
- Guided workflow on your smartphone
- Verification and validation by the Socomec Service Center

**Three-phase UPS**
**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.

**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.

**Technical data**

<table>
<thead>
<tr>
<th>MASTERSYS GP4</th>
<th>60</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>160</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn [kVA]</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>160</td>
</tr>
<tr>
<td>Pn [kW]</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>160</td>
</tr>
<tr>
<td>Input/output 3/3</td>
<td>up to 6 units</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallel configuration</td>
<td>3/3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INPUT**

- Rated voltage: 400 V 3ph+N (3 wire input also available on demand).
- Voltage tolerance: ±1% (configurable from 1% to 4%)
- Rated frequency: 50/60 Hz ± 1%
- Power factor: 1 (according to IEC 62040-3)
- Efficiency (TÜV SÜD verified): up to 95.5%

**OUTPUT**

- Rated voltage: 3ph+N: 400 V (can be configured 380/415 V)
- Voltage tolerance: ±5% (configurable from 1% to 20%)
- 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
- Frequency tolerance: ±2%

**EFFICIENCY (TÜV SÜD verified)**

- Double conversion mode: up to 96.5%
- Always on mode: up to 99.9%

**ENVIROMENT**

- 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, < 60 dBA, < 65 dBA

**UPS CABINET**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>W</th>
<th>600 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D</td>
<td>855 mm</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>1400 mm</td>
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<tr>
<td></td>
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<td>1930 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>174 kg</td>
<td>186 kg</td>
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<tr>
<td>Degree of protection</td>
<td>IP20</td>
<td></td>
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<tr>
<td>Colours</td>
<td>RAL 7016</td>
<td></td>
</tr>
</tbody>
</table>

**STANDARDS**

- Safety EMC: IEC/EN 62040-1, AS 62040.1.1, AS 62040.1.2
- Performance: IEC/EN 62040-3, AS 62040.3
- Environmental: full compliance with the RoHS EU directive
- Seismic compliance: on demand, in accordance with the Uniform Building Code UB C-1997 Zone 4
- Product declaration: CE, RCM (E2376)

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**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

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**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.
- 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.
- 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.

---

**The solution for**

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

**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

---

**Our dedicated Expert Services for UPS**

[www.socomec.com/services](http://www.socomec.com/services)
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>DELPHYS GP</th>
<th>320</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>800</th>
<th>1000</th>
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<td>200</td>
<td>250</td>
<td>320</td>
<td>400</td>
<td>500</td>
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<td>up to 4 MW</td>
<td>up to 4 MW</td>
<td>up to 4 MW</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>400 V 3ph</td>
<td>400 V 3ph</td>
<td>400 V 3ph</td>
<td>400 V 3ph</td>
<td>400 V 3ph</td>
<td>400 V 3ph</td>
</tr>
<tr>
<td>Voltage tolerance static load</td>
<td>±1% dynamic load in accordance with VFI-SS-111</td>
<td>±1% dynamic load in accordance with VFI-SS-111</td>
<td>±1% dynamic load in accordance with VFI-SS-111</td>
<td>±1% dynamic load in accordance with VFI-SS-111</td>
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<tr>
<td>Frequency tolerance</td>
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<td>±10 Hz</td>
<td>±10 Hz</td>
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<td>±10 Hz</td>
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<tr>
<td>Power factor / THD</td>
<td>&gt; 0.99% &lt; 2.5% (1)</td>
<td>&gt; 0.99% &lt; 2.5% (1)</td>
<td>&gt; 0.99% &lt; 2.5% (1)</td>
<td>&gt; 0.99% &lt; 2.5% (1)</td>
<td>&gt; 0.99% &lt; 2.5% (1)</td>
<td>&gt; 0.99% &lt; 2.5% (1)</td>
</tr>
</tbody>
</table>

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 @ 40% of load: up to 96%
- Online mode @ 75% of load: up to 96%
- Online mode @ 100% of load: up to 96%
- Fast EcoMode: up to 99%

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): < 65 dB(A) < 67 dB(A) < 70 dB(A) < 68 dB(A) < 70 dB(A) < 72 dB(A) < 74 dB(A)

UPS CABINET
- Dimensions: W 700 mm 1000 mm 1400 mm 1600 mm 2800 mm 3510 mm 3910 mm 4510 mm
- H 800 mm 950 mm 800 mm 950 mm 950 mm 950 mm 1930 mm 2060 mm
- Weight: 470 kg | 490 kg | 850 kg | 980 kg | 1000 kg | 1500 kg | 2300 kg | 2850 kg | 3850 kg
- Degree of protection: IP20 (other IP as option)
- Colours: cabinet: RAL 7012, door: silver grey

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. (2) Worst condition (Auxiliary Mains not available). (3) With input THDV < 1%. (4) 160, 200 and 500 MVA/kW models.

Electrical options
- Seperated 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 contacta).
- 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.
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

Advantages
- 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 centralized static bypass.
- Common or separated rectifier and bypass masts.
- 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
- Backfeed 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.

Dimensions

DELPHYS Xtend GP
Green Power 2.0 range up to 2.4 MVA/MW

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</td>
<td>2 3 4 2 3 4 5 2 3 4 5 6</td>
</tr>
<tr>
<td>Power (kVA/kW)</td>
<td>N configuration</td>
</tr>
<tr>
<td>Voltage</td>
<td>400 600 800 400 600 800 1000 400 600 800 1000 1200</td>
</tr>
<tr>
<td>Frequency</td>
<td>200 400 600 200 400 600 400 600 800 200 400 600 800 1000</td>
</tr>
</tbody>
</table>
| Total harmonic distortion (THDI at full load and rated voltage) | 2.5%/2%

RECTIFIER INPUT

| Voltage                              | 400 V 3ph (200 to 480 V~) |
| Frequency                            | 50/60 Hz                   |
| Power factor                         | > 0.99                     |

INVERTER

| Power factor                         | 1 (according to IEC/EN 62040-3) |
| Rated output voltage                 | 400 V 3ph + N (380 / 415 V configurable) |
| Rated output frequency               | 50/60 Hz (selectable)           |
| Harmonic voltage distortion          | THdL ≤ 1.5 % with rated linear load |

BYPASS

| Rated voltage                         | nominal output voltage ±15 % (settable) |
| Rated frequency                       | 50/60 Hz (selectable) |

XMODULE EFFICIENCY

| Online double conversion mode         | up to 96% |
| Fast EcoMode                          | up to 99% |

ENVIRONMENT

| Operating ambient temperature         | from 10 °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) |

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) IGBT rectifier. (2) Conditions apply. (3) With input THDV < 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

(1) For any other configuration (centralized bypass, "U" shape, "L" shape, etc.), please contact us.

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

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.

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

DC cabinet AC cabinet Xmodule Xbay

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.

DELPHYS Xtend GP
Three-phase UPS
Green Power 2.0 range up to 2.4 MVA/MW

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.

600 kW, online double conversion mode

600 kW, online double conversion mode

30 minutes later: 800 kW, online double conversion mode
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.
MODULYS GP
Unique, fully modular and redundant solution

Green Power 2.0 range from 25 to 600 kVA/kW

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.

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 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.
Standard electrical features
- Dual input mains.
- Internal maintenance auxiliary mains bypass.
- 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.

Standard communication features
- User-friendly multilingual interface with colour graphic display.
- Commissioning wizard.
- 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 GP</th>
<th>UPS SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Sn) 25 to 200 kW</td>
<td>25 to 200 kW</td>
</tr>
<tr>
<td>Power (Pn) 25 to 200 kW</td>
<td>25 to 200 kW</td>
</tr>
<tr>
<td>Number of power modules 1 to 8</td>
<td>1 to 16</td>
</tr>
<tr>
<td>Input / output 3/3</td>
<td></td>
</tr>
<tr>
<td>Redundant configuration</td>
<td>N+x</td>
</tr>
<tr>
<td>INPUT</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>400 V 3ph+N (340 V to 480 V)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz ±10%</td>
</tr>
<tr>
<td>Power factor / THDI</td>
<td>&gt; 0.99 / &lt; 1.5%</td>
</tr>
<tr>
<td>OUTPUT</td>
<td></td>
</tr>
<tr>
<td>Power factor</td>
<td>1 (according to IEC/EN 62040-3)</td>
</tr>
<tr>
<td>Voltage</td>
<td>300/400/415 V ±1% 3ph+N</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz ±0.1%</td>
</tr>
<tr>
<td>Voltage distortion</td>
<td>&lt; 1% (linear load), &lt; 3% (non-linear load according to IEC 62040-3)</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>up to 3 Ika</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>Voltage</td>
<td>rated output voltage ±15% (configurable with from 10% to 20%)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz ±2% (configurable for Gel battery compatibility)</td>
</tr>
<tr>
<td>EFFICIENCY (TÜV SÜD VERIFIED)</td>
<td></td>
</tr>
<tr>
<td>Online double conversion mode</td>
<td>up to 96.5%</td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 °C to 40 °C (15 to 25 °C for maximum battery life)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>0 to 95% without condensation</td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>1000 m without derating (3000 m max)</td>
</tr>
<tr>
<td>Acoustic level at 1 m</td>
<td>&lt; 55 dBA</td>
</tr>
<tr>
<td>SYSTEM CABINET</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>600 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>990 mm</td>
</tr>
<tr>
<td>Height</td>
<td>1975 mm</td>
</tr>
<tr>
<td>Weight (empty cabinet)</td>
<td>210 kg</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
</tr>
</tbody>
</table>

STANDARDS
- Safety: IEC 62040-1, AS 62040.1.1, AS 62040.1.2
- EMC: IEC 62040-2 Class C2, AS 62040.2
- Performance: WR-SS-111 - IEC 62040-3, AS 62040.3
- Environmental: IEC 62040-4
- Product declaration: CE, RCM (E2376)

POWER MODULE
- Height | 3U |
- Weight | 34 kg |
- Type | Hot plug-in / Hot-swappable |
- MTBF | > 1 000 000 hours (calculated and verified)
MODULYS GP
Three-phase UPS
Green Power 2.0 range from 25 to 600 kVA/kW

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.
**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.

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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**MODULYS GP**
- ELECTRONICS-FREE CABINET + HOT-SWAP PARTS

**GREEN POWER 2.0**
- Three-phase UPS

**Range from 25 to 600 kVA/kW**

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**MODULYS GP**
- ELECTRONICS-FREE CABINET
- HOT-SWAP PARTS

**FORERUNNER**
- REPLACEMENT (HOT-SWAP)

**FOREVER YOUNG**
- REPLACEMENT (HOT-SWAP)
**MODULYS RM GP**

Rack-mounted modular UPS system

*Green Power 2.0* range up to 4 x 25 kW

---

**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.

---

**The solution for**

- Integration in 19" standard rack cabinets
- Computer rooms
- Data centers
- Banks
- Healthcare facilities
- Insurance
- Telecom

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**Certifications and attestations**

Green Power 2.0 MODULYS RM GP module is certified by TÜV SÜD with regard to product safety (EN 62040-1).

Green Power 2.0 MODULYS module efficiency & performance are tested and verified by TÜV SÜD.

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**Advantages**

- **Up to 4 x 25 kW**
- **Highest rack-mounted UPS power density on the market**
- **kW = kVA**
- **Unity power factor provides the best €/kW ratio**
- **96% Efficiency**
- **High efficiency minimises energy consumption and reduces energy costs**
- **Li-ion**
- **Ready for Li-ion battery. Ultra-fast recharge function**

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**MODULYS RM GP**

Three-phase UPS

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**General Catalogue 2018-2019**
### Standard electrical features
- Dual input mains.
- Internal maintenance bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.
- Battery temperature sensor.

### 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.

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

### Technical data

<table>
<thead>
<tr>
<th>MODULYS RM GP</th>
<th>9U</th>
<th>1SU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>MODULYS RM GP</td>
<td>MODULYS RM GP</td>
</tr>
<tr>
<td><strong>Number of power modules</strong></td>
<td>1 to 2 x 25 kW</td>
<td>1 to 4(1) x 25 kW</td>
</tr>
<tr>
<td><strong>Configuration</strong></td>
<td>N, N+1 redundant</td>
<td>N, N+1 redundant</td>
</tr>
<tr>
<td><strong>Power (SIN)</strong></td>
<td>25 to 50 kW</td>
<td>25 to 75 kW</td>
</tr>
<tr>
<td><strong>Power (Pn)</strong></td>
<td>25 to 50 kW</td>
<td>25 to 75 kW</td>
</tr>
<tr>
<td><strong>Input / output</strong></td>
<td>3/3</td>
<td>3/3</td>
</tr>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>400 V 3ph+N (340 V to 480 V)</td>
<td>400 V 3ph+N (340 V to 480 V)</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50/60 Hz ±1%</td>
<td>50/60 Hz ±1%</td>
</tr>
<tr>
<td><strong>Power factor / THDI</strong></td>
<td>&gt; 0.99 &lt; 3%</td>
<td>&gt; 0.99 &lt; 3%</td>
</tr>
<tr>
<td><strong>OUTPUT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>380/400/415 V ± 1% 3ph+N</td>
<td>380/400/415 V ± 1% 3ph+N</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50/60 Hz ±0.1%</td>
<td>50/60 Hz ±0.1%</td>
</tr>
<tr>
<td><strong>Voltage distortion</strong></td>
<td>&lt; 1% (linear load), &lt; 4% (non-linear load according to IEC 62040-3)</td>
<td>&lt; 1% (linear load), &lt; 4% (non-linear load according to IEC 62040-3)</td>
</tr>
<tr>
<td><strong>Short-circuit current</strong></td>
<td>up to 3 in</td>
<td>up to 3 in</td>
</tr>
<tr>
<td><strong>Overload</strong></td>
<td>125% for 10 minutes, 150% for 1 minute</td>
<td>125% for 10 minutes, 150% for 1 minute</td>
</tr>
<tr>
<td><strong>Crest factor</strong></td>
<td>3:1</td>
<td>3:1</td>
</tr>
<tr>
<td><strong>HOT-SWAP BYPASS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>Rated output voltage ±15% (configurable from 10% to 20%)</td>
<td>Rated output voltage ±15% (configurable from 10% to 20%)</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50/60 Hz ±2% (configurable for GenSet compatibility)</td>
<td>50/60 Hz ±2% (configurable for GenSet compatibility)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>7 kg</td>
<td>7.5 kg</td>
</tr>
</tbody>
</table>

### EFFICIENCY (TÜV SÜD Verified)
- Online double conversion mode: up to 96.5%

### ENVIRONMENT
- 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)
- Maximum ambient temperature: < 53 °C

### UPS RACK
- **Dimensions W x D x H**
  - 9U: 442 mm x 920 mm x 9 U
  - 15U: 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 A
- **Performance**
  - EN 62040-3 (IEC 62040-3) (2018-2019)
- **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.
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.
A complete, cost-effective solution

- Designed to protect production processes and IT applications.
- Separate rectifier supply and bypass networks for 3/1 models.
- Internal manual bypass for easy maintenance without power interruption.
- LAN network interface for remote UPS management and supervision.
- Scalable power or increased system availability placing up to 6 units in parallel.
- Redundant batteries based on two independent strings connected in parallel ensuring the back-up time even in the event of failure of one string.
- Flexible battery solutions.

Tailored to your environment

- Saves space with a reduced footprint and optimized cabinet size.
- Low noise level.
- Compact, lightweight and easy to install.
- Extended battery life and performance with exclusive EBS battery charging management for increased battery life.
- Color graphical display with up to 30 languages embedded, including simplified and traditional Chinese.

The solution for

- Industrial networks
- Servers
- Telecommunications
- Medical and laboratories

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

Some models may not be available in your country – please check with your local sales office.
Technical data

<table>
<thead>
<tr>
<th>MASTERYS MC</th>
<th>Sn (kVA)</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>60</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn (kW)</td>
<td></td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>24</td>
<td>32</td>
<td>54</td>
<td>72</td>
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<tr>
<td>Input/output 3/1</td>
<td></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Input/output 3/3</td>
<td></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Parallel configuration</td>
<td></td>
<td>up to 6 units</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standard electrical features

- Dual input mains.
- Internal manual bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.
- Multilanguage display including simplified and traditional chinese.

Electrical options

- External battery cabinet for extended back-up time.
- External temperature sensor.
- Additional battery charger.
- Parallel kit.
- ACS synchronization system (3/3).
- External maintenance bypass.

Standard communication features

- MODBUS/JBUS RTU.
- 2 slots for communication options.
- Additional RS232 interface.
- Embedded LAN interface (web pages, email).

Communication options

- Dry-contact interface.
- Remote mimic panel.
- 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**

### MASTERYS MC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn (kVA)</td>
<td>10</td>
</tr>
<tr>
<td>Pn (kW)</td>
<td>8</td>
</tr>
<tr>
<td>Input/output 3/1</td>
<td>•</td>
</tr>
<tr>
<td>Input/output 3/3</td>
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<tr>
<td>Parallel configuration</td>
<td>up to 6 units</td>
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</table>

**Standard electrical features**

- Dual input mains.
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**Remote monitoring service**

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

**Advantages**
- Scalable power and high availability (using redundancy), with the facility to parallel up to 6 units.
- Double EMC immunity compared to UPS international standard IEC 62040-2.
- Dust and water splash resistant enclosure (IP52) with easy replaceable dust filters (option).
- Operation at temperature up to 50 °C.
- Floor anchoring (to prevent tilting).

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

**Technical data**

<table>
<thead>
<tr>
<th>Power factor / THDI</th>
<th>Frequency tolerance ± 10%</th>
<th>Rated frequency 50/60 Hz</th>
<th>Voltage tolerance ± 15% up to -40% @ 50% of rated power</th>
<th>Crest factor 3:1 (complying with IEC 62040-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>S</td>
<td>T</td>
<td>U</td>
<td>V</td>
</tr>
</tbody>
</table>

**The solution for**
- Industrial processes
- Services
- Medical

**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**

**Stands and networks**
- Easy integration into industrial networks
- Fully compatible with generator sets
- 0% - 95% without condensation
- Operating ambient temperature from 0 °C up to +50 °C
- Frequency tolerance ± 10%
- Rated frequency 50/60 Hz
- Voltage tolerance ± 20% (2)
- Rated voltage 1ph + N: 230 V (can be configured 220/240 V)

**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><strong>Sn [kVA]</strong></td>
</tr>
<tr>
<td><strong>Pn [kW] - 3/1</strong></td>
</tr>
<tr>
<td><strong>Pn [kW] - 3/3</strong></td>
</tr>
<tr>
<td><strong>Parallel configuration</strong> (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)

**EBS** (Expert Battery System) for battery management.

**BACKFEED PROTECTION**
- Detection circuit.

**INTERNAL MAINTENANCE BYPASS**
- ACS synchronization system.
- Parallel kit.
- Cold start.
- ACS synchronization system.
- Neutral creation kit for mains without neutral.
- Tropicalization and anti-corrosion protection for electrical boards.

**RATED FREQUENCY**
- 50/60 Hz
- Voltage tolerance: ± 20% (up to -40% @ 50% of rated power)
- Frequency tolerance: ± 2% (configurable from 1% to 8% with generating set)

**ENVIRONMENT**
- Operating ambient temperature: from 0 °C up to +50 °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): < 52 dB(A) | < 55 dB(A) | < 65 dB(A)

**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 | 330 kg | 370 kg | 500 kg | 550 kg
- Degree of protection (according to IEC 60529): IP51 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)

(1) With transformer on input/bypass side. (2) Conditions apply.
(3) At source THDV < 2% and nominal load.

**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**
• Multilingual graphic display.
• Dry contact interface.
• MODEBUS RTU.
• Embedded LAN interface (web pages, email).
• 2 slots for communication options.

**Communication options**
• M400BUS.
• MODEBUS TCP.
• NETVISION: 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 IP**

Reliable protection for industrial processes from 10 to 40 kVA

**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.
- Color graphical display with up to 30 languages embedded, including simplified and traditional Chinese.
- Flexible communication boards for every industrial communication need: dry contacts, MODBUS, PROFI BUS, etc.
- Fully compatible with generator sets.

**Designed for demanding environments**
- Designed to protect industrial processes.
- A compact solution with isolation transformer integrated into the UPS cabinet.
- Full metallic enclosure (IP21 cabinet).

**Tailored to your needs**
- Easy to install and to handle (fitted with castors).
- Fitted with dry contact remote signalling interface.
- Protection against backfeed on the upstream network (internal or external backfeed).
- Separate rectifier and bypass mains.

Some models may not be available in your country – please check with your local sales office.
**Standard electrical features**
- Dual input mains.
- Internal manual bypass.
- Backfeed protection: detection circuit.

**Electrical options**
- External maintenance bypass.
- External battery cabinet.
- Parallel kit.
- ACS synchronization system.
- Permanent isolation controller (CPI).
- Power share.

**Standard communication features**
- Multilanguage display including simplified and traditional Chinese.
- MODBUS/IBUS RTU.
- 2 slots for communication options.
- Dry contact interface.
- Embedded LAN interface (web pages, email).

**Communication options**
- Remote mimic panel.
- 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>Parameter</th>
<th>MASTERYS IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn [kVA]</td>
<td>10 15 20 30 40</td>
</tr>
<tr>
<td>Pn [kW]</td>
<td>8 12 16 24 32</td>
</tr>
<tr>
<td>Input / output 3/1</td>
<td>• • • • •</td>
</tr>
<tr>
<td>Input / output 3/3</td>
<td>• • • • •</td>
</tr>
<tr>
<td>Parallel configuration(1)</td>
<td>up to 6 units</td>
</tr>
</tbody>
</table>

**INPUT**
- Rated voltage 400 V(2)
- Voltage tolerance ± 20% (up to -35% @ 70% of rated power)
- Rated frequency 50/60 Hz ± 10%
- Power factor / THDI(3) 0.99 < 3%

**OUTPUT**
- Rated voltage 1ph + N: 230 V (can be configured 220/240 V) 3ph + N: 400 V (380 / 415 V configurable)(4)
- Voltage tolerance ± 1.1%
- Frequency tolerance ± 2% (configurable from 1% to 8%)
- Overload 125% for 10 minutes, 150% for 1 minute
- 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 20% with generating set)
- Rated frequency 50/60 Hz
- Frequency tolerance ± 2% (configurable from 1% to 8% with generating set)

**EFFICIENCY**
- Online mode @ 100% of load up to 93%

**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 dB

**UPS CABINET**
- Dimensions W x D x H 444 x 795 x 1400 mm
- Weight (3/1 / 3/3) 200/205 kg 210/215 kg 230/285 kg - / - 305 kg - / - 340 kg
- Degree of protection IP21

**STANDARDS**
- Safety IEC/EN 62040-1-1, AS 62040.1.1, AS 6204.1.2
- EMC IEC/EN 62040-2, AS 62040.2
- Performance IEC/EN 62040-3, AS 62040.3
- Product declaration CE, RCM (E2376)

---

(1) With transformer on input/bypass side.
(2) Three phase 220 - 230 - 240 V from 15 to 30 kVA on demand.
(3) For source THDV < 2% and nominal load.
(4) Three phase 220-230-240 V from 15 to 40 kVA.
DELPHYS MP Elite+
Resilient transformer-based power protection from 60 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 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.

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)

Advantages

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

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
High quality power supply specifically designed to be adapted to:

- Soft start capability (ramp up) of the IGBT
- Cascade failure prevention for parallel systems.
- Accurate diagnostics guarantee power.
- Fault-tolerant architecture with redundancy of.
- Field-proven technology.
- Sinusoidal ThdU output voltage < 2% with.
- An isolation transformer installed on the.
- High overload capability to withstand.
- Output voltage precision under all load.
- Permanent operation in VFI mode.
- Three-phase UPS capability, long back up time… a genset.
- Industrial environments.
- Supply to the load.
- Basic functions, such as the ventilation system.
- Separation between the two inputs when.
- Output. This insulation also provides a.
- Isolation between DC circuit and load.
- Distribution.
- Abnormal load conditions.
- (online double conversion).
- From 60 to 200 kVA
- Resilient transformer-based power protection
- DELPHYS MP Elite+
- Three-phase UPS
- Easy access to subassemblies and.
- A remote access device connected to the.
- • An advanced diagnostic system.
- Remote monitoring service
- LINK-UPS, remote monitoring service that connects your UPS to your Critical Power specialist 24/7.

Electrical options

- EBS (Expert Battery System)(1).
- 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.
- Reinforced IP protection degree.
- Dust filters.
- Fan redundancy with failure detection.
- Top entry connection.
- Reinforced IP protection up to I5P2.

Mechanical options

- Reinforced IP protection degree.
- Dust filters.
- Fan redundancy with failure detection.
- Top entry connection.
- Reinforced IP protection up to I5P2.

Communication options

- GTS (Graphic Touch Screen).
- ADC interface (configurable voltage-free contacts).
- MODBUS RTU.
- MODBUS TOP.
- 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.

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).

Technical data

<table>
<thead>
<tr>
<th>DELPHYS MP Elite+</th>
<th>Sn [kVA]</th>
<th>60</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>160</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn [kW]</td>
<td>54</td>
<td>72</td>
<td>90</td>
<td>108</td>
<td>144</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>Input / output</td>
<td>3/3</td>
<td></td>
<td></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>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INPUT**

- Rated voltage: 380V - 400V - 415V(1)
- Voltage tolerance: ± 10% (selectable)
- Rated frequency: 50/60Hz
- Frequency tolerance: ± 0.2%
- Total output voltage distortion - linear load: ThdU < 2%
- Total output voltage distortion - non-linear load: ThdU < 4%
- Short-circuit current on inverter (100ms): Up to 3.5 In
- Crest factor: 3:1
- Overload: Up to 150% for 1 minute, 125% for 10 minutes(2)
- Efficieny:
  - Online mode: 93.5%
  - Eco Mode: 98%

**OUTPUT**

- Rated voltage: 380V - 400V - 415V (configurable)(1)
- Voltage tolerance: < 1% (static load), ± 2% in 5 ms (dynamic load conditions from 0 to 100%)
- Rated frequency: 50/60Hz
- Frequency tolerance: ± 0.2%
- Total output voltage distortion - linear load: ThdU < 2%
- Total output voltage distortion - non-linear load: ThdU < 4%
- Short-circuit current on by-pass (20ms): Up to 24 In

**EFFICIENCY**

- Operating ambient temperature: from 0 °C up to +40 °C(3) (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 600 x 1930 mm
  - Weight: 740 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)

(1) Others on demand. (2) Conditions apply.
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
- DELPHYS MX series is attested by Bureau Veritas.

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
**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).

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

**Communication options**
- GTS (Graphic Touch Screen).
- ADC interface (configurable voltage-free contacts).
- MODBUS RTU.
- MODBUS TCP.
- PROFINET / PROFIBUS.
- 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**

| DELPHYS MX | | |
|---|---|---|---|---|---|---|
| Sn [kVA] | 250 | 300 | 400 | 500 | 800 | 900 |
| Pn [kW](1) | 225 | 270 | 360 | 450 | 720 | 810 |
| Input/output | | | | | | |
| Parallel configuration | up to 6 units |
| INPUT | | | | | | |
| Rated voltage(2) | 380 V - 400 V - 415 V |
| Voltage tolerance | 340 to 480 V |
| Rated frequency | 50/60 Hz |
| Frequency tolerance | ± 5 Hz |
| Power factor / THD | 0.93 / < 4.5% |
| OUTPUT | | | | | | |
| Rated voltage | 380 V - 400 V - 415 V |
| Voltage tolerance | < 1 % (static load), ± 2% in 5 ms (dynamic load conditions from 0 to 100%) |
| Rated frequency | 50/60 Hz |
| Frequency tolerance | ± 0.2% |
| Total output voltage distortion - linear load | ThdU < 2% |
| Total output voltage distortion - non-linear load (IEC 62043-3) | ThdU < 3.2 % |
| Short-circuit current | Up to 4.4 In |
| Overload | 150% for 1 minute, 125% for 10 minutes |
| Crest factor | 3:1 |
| Admissible power factor without derating | Inductive up to 0.9 leading |
| BYPASS | | | | | | |
| Rated voltage | 380 V - 400 V - 415 V |
| Voltage tolerance | ± 10% |
| Rated frequency | 50/60 Hz |
| Frequency tolerance | ± 2% (configurable for GenSet compatibility) |
| EFFICIENCY | | | | | | |
| Online mode | up to 93.5% |
| Eco Mode | 99% |
| ENVIRONMENT | | | | | | |
| Operating ambient temperature | from 0 °C up to +35 °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)(3) | ≤ 70 dBA |
| | ≤ 72 dBA |
| | ≤ 75 dBA |
| UPS CABINET | | | | | | |
| Dimensions W x D x H | 1600 x 995 x 1930 mm |
| Weight | 2500 kg |
| Degree of protection | IP20 |
| Colours | RAL 9006 |

**STANDARDS**
- Safety: IEC/EN 62041-1, 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, CMC (E3376)

(1) Conditions apply. (2) DELPHYS MX 250-500: others on demand. (3) As per power range.

---

DELPHYS MX
Three-phase UPS
from 250 to 900 kVA

General Catalogue 2018-2019
**SHARYS IP**

Rugged, reliable DC power solution
24/48/108/120 V from 15 to 200 A

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.
Limited thermal stress and longer life of the
Microprocessor control.
PCB tropicalisation as standard.

Reliability and robustness
a wide range of situations.
Customization possibilities complete the
innovative mix.
A robustly designed frame creating an
redundancy N+1 and scalability along with
modularity, hot swap module replacements,
SHARYS IP combines telecom features like
with the objective of reliable DC supply.

Degree of protection IP30
Expandable according to future
requirements by adding additional rectifier
modules.

Rugged, reliable DC power solution
SHARYS IP
24/48/108/120 V from 15 to 200 A

Easy, user-friendly operation
Total Costs of Ownership (TCO)

Adapted to be used with different types of
Digital control and monitoring of the rectifier
Process continuity with hot-swap
Reduced maintenance costs.

Sinusoidal current absorption with power
factor close to one: low conductor heat
consumption, low heat dissipation.

Certifications

The solution for
Signalling
Switchgear tripping

All SHARYS IP (SH-IP) series rectifiers are
certified by TÜV SÜD with regard to product
safety (EN 61204-7 and EN 60950-1).

Technical data

<table>
<thead>
<tr>
<th>Model</th>
<th>SHARYS IP - Rectifier Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating voltage</td>
<td>230 V 1ph + N</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>±20% @ 100% I_p up to -50% @ 40% I_p</td>
</tr>
<tr>
<td>Frequency</td>
<td>47.5 … 63 Hz</td>
</tr>
<tr>
<td>Power factor</td>
<td>≥ 0.99</td>
</tr>
<tr>
<td>Absorbed current distortion</td>
<td>compleiles with standard EN 61000-3-2</td>
</tr>
<tr>
<td>Insertion</td>
<td>limited by precharge circuit</td>
</tr>
</tbody>
</table>

OUTPUT

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>24 V</th>
<th>48 V</th>
<th>108 V</th>
<th>120 V</th>
<th>24 V</th>
<th>48 V</th>
<th>108 V</th>
<th>120 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage regulation</td>
<td>21-29 V</td>
<td>42-58 V</td>
<td>95-131 V</td>
<td>105-145 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated current</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>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent current overload with constant power</td>
<td>105% of rated current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual ripple (with I_p ≥ 10%)</td>
<td>AC &lt; 50 mV, PP &lt; 100 mV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current imbalance in parallel operation</td>
<td>≤ 0.05 I_p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic behaviour on load variation (ΔV_o = 50% I_p in the range 10-100% I_p)</td>
<td>Δ V_o ≤ 4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EFFICIENCY

Typical | 90% | 90% | 91% | 92% | 93% | 93% |

ISOLATION

Input/output dielectric rigidity | 3 kV (50 Hz for 60 s) |

ENVIRONMENT

Operating ambient temperature | -5 … 45 °C without derating, up to 55 °C with power derating |
Relative humidity | 10% to 90% |
Cooling | Forced with intelligent fan speed control |

CONNECTIONS

Connections | Plug in + locking screw |

RECTIFIER ENCLOSURE

Degree of protection | IP20 |
Colours | RAL 7012 |

STANDARDS

Safety | IEC/EN 61204-7 |
EMC | EN 61204-3, EN 61000-6-4, EN 61000-6-2 |
Performance | IEC/EN 61204 |
Resistance to vibrations | ASTM D999 |
Resistance to falls | ASTM D5276 |

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>Rating voltage</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% P_n up to -50% @ 40% P_n</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>
</tbody>
</table>

OUTPUT

| Rated voltage (V) | 24 | 48 | 108 | 120 |
| Rated current (A) | 100 | 30 | 60 | 100 |
| Maximum power (kW) | 2.4 | 1.4 | 2.9 | 4.8 |
| Max number of rectifier | 2 modules | 2 modules |
| Voltage regulation (ΔV_o) | 21-29 V | 42-58 V |
| Voltage ripple (ΔV_o) | 42-58 V | 95-131 V |

RECTIFIER CABINET

Dimensions W x D x H | 600 x 535 x (894 to 1254) mm |
Weight | 60 to 75 kg |
Degree of protection | IP30 |
Colours | RAL 7012 |

Certifications

(1) System only

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

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

Communication options

- NET VISION for DC systems: professional WEB/SNMP interface for DC system monitoring and shutdown management of several operating systems (3).

General Catalogue 2018-2019
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>SH-IP-048030</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>
Full battery compatibility

SHARYS IP design is compatible with different battery technologies\(^{(1)}\) 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. Status LED
4. Selection button
5. Battery discharge status
6. 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) Automatic self-test fan failure detection

Optimized efficiency design point

General Catalogue 2018-2019

SHARYS IP
Rectifiers
24/48/108/120 V from 15 to 200 A

Typical configurations

<table>
<thead>
<tr>
<th>Batt (VDC)</th>
<th>In (VAC)</th>
<th>Out (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>115 V(1)</td>
<td>40%</td>
</tr>
<tr>
<td>48 V DC</td>
<td>184 V(1)</td>
<td>40%</td>
</tr>
<tr>
<td>108 V DC</td>
<td>276 V(1)</td>
<td>40%</td>
</tr>
<tr>
<td>120 V DC</td>
<td>322 V(1)</td>
<td>40%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Batt (VDC)</th>
<th>In (VAC)</th>
<th>Out (A)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>100%</td>
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<td>184 V(1)</td>
<td>100%</td>
</tr>
<tr>
<td>108 V DC</td>
<td>276 V(1)</td>
<td>100%</td>
</tr>
<tr>
<td>120 V DC</td>
<td>322 V(1)</td>
<td>100%</td>
</tr>
</tbody>
</table>

Optimal Input Power

\[ P_{\text{input}} = \frac{V_{\text{in}} \times I_{\text{out}}}{\text{Efficiency}} \]

Optimal Output Power

\[ P_{\text{output}} = \frac{V_{\text{out}} \times I_{\text{out}}}{\text{Efficiency}} \]

Efficiency (%)

- 83
- 87
- 88
- 89
- 90
- 91

Mains

<table>
<thead>
<tr>
<th>Phase</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>230 V</td>
</tr>
<tr>
<td>2.</td>
<td>380 V</td>
</tr>
<tr>
<td>3.</td>
<td>415 V</td>
</tr>
<tr>
<td>4.</td>
<td>460 V</td>
</tr>
<tr>
<td>5.</td>
<td>500 V</td>
</tr>
<tr>
<td>6.</td>
<td>550 V</td>
</tr>
</tbody>
</table>

Optimal Efficiency

- 105%
- 107%
- 109%
- 111%

Optimal Power Rate (%)

- 50%
- 60%
- 70%
- 80%
- 90%
- 100%

Optimal Temperature

- -5 °C
- 45 °C
- 55 °C

Optimal Speed

- 45%
- 65%
- 83%
Complementary solutions

Back-up storage
- Back-up energy and power ................................................................. p. 86
- Battery storage systems ................................................................. p. 87
- Battery cabinets ............................................................................. p. 88
- W-BMS ......................................................................................... p. 90
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Static Transfer Systems
- STATYS ....................................................................................... p. 96
- STATYS XS ............................................................................... p. 98
- IT-SWITCH ................................................................................ p. 100

Communication and Connectivity ............................................................. p. 102

Power Distribution Unit (PDU)
- RACK PDU ............................................................................... p. 104
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.

---

**Why have back-up energy?**

The energy storage stage within a UPS system is a key element, as its purpose is to provide the load with immediate power when the main power supply is unavailable. The choice and sizing of the energy storage systems is based on various factors such as load characteristics, quality of the power supply network, the electrical infrastructure where the UPS is installed, and the environmental characteristics of the technical room.

---

**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.

- **“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.
In UPS applications, energy storage is used for two main reasons:

- ‘Energy’ type applications: the UPS uses the storage system to provide the necessary energy. This can take place in two ways depending on the specific application:
  - When the main power supply is unavailable or until the UPS value is met, while the storage system provides the UPS with the maximum acceptable UPS values, thus supporting the UPS system for a limited period of time, e.g. when the main supply is affected by micro interruptions.
  - Provided with power for an extended order to optimise the total cost of ownership when choosing an energy storage system in special applications.

- ‘Power’ type applications: the UPS is optimised for Back-up storage systems with high power, recharged quickly, and generally perform well under cyclic charge/discharge cycles.

**Why have back-up energy?**

- Back-up storage: where the UPS is installed, and the environmental characteristics of the technical room.
  - Maintenance requirements.
  - Safety to be guaranteed in the technical room.

**The choice and sizing of the energy storage system** is based on various factors such as:

- The load characteristics, quality of the power supply network, the electrical infrastructure.
- The electrical infrastructure, power availability, and the electrical infrastructure.
- The electrical infrastructure, power availability, and the electrical infrastructure.
- The environmental characteristics of the technical room.
- The electrical infrastructure, power availability, and the electrical infrastructure.

**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 storage systems**

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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>Standard degree of protection</th>
<th>IP20 (according to IEC 60529)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional degree of protection</td>
<td>IP32(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°± +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.
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.
Li-Ion Battery UPS
Compact innovative power protection solution

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).

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.

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.
Li-Ion Battery UPS
Compact innovative power protection solution

LI-ION BATTERY UPS: footprint comparison with VRLA batteries

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 vs. Lead-Acid batteries

<table>
<thead>
<tr>
<th>Power</th>
<th>Back-up Time</th>
<th>Space saving</th>
<th>Footprint VRLA Battery</th>
<th>Footprint Li-Ion Battery UPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 kVA</td>
<td>8 min</td>
<td>+51.6%</td>
<td>0.95 m²</td>
<td>1.96 m²</td>
</tr>
<tr>
<td>500 kVA</td>
<td>9 min</td>
<td>+37.8%</td>
<td>2.69 m²</td>
<td>4.32 m²</td>
</tr>
<tr>
<td>1.2 MVA</td>
<td>8 min</td>
<td>+43.6%</td>
<td>7.87 m²</td>
<td>13.93 m²</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.

The solution for
- Data centres
- IT infrastructures
- Industrial processes

Attestations
LI-ION CAPACITOR UPS is designed and developed in Europe by Socomec in partnership with JSR, Japanese leader in materials innovation.

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.
**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**

---

**Li-Ion Capacitor UPS**
Powerful and reliable solution for applications requiring short back-up times

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**Li-Ion Capacitor UPS**
Powerful and reliable solution for applications requiring short back-up times
STATYS

Redundant design for power availability and site maintainability from 32 to 1800 A

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 over sizing for non-linear loads comparibility.
• 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 Mimi Panel.
• Full digital configuration and setting.

Technical data

<table>
<thead>
<tr>
<th>STATYS</th>
<th>19” 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>no restrictions</td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td>STANDARDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>IEC 62310, IEC 60529, AS 62310, AS 60529</td>
<td></td>
</tr>
<tr>
<td>EMC</td>
<td>C2 category (IEC 62310-2, AS 62310.2)</td>
<td></td>
</tr>
<tr>
<td>Product declaration</td>
<td>CE, RCM (E2378)</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>19” Rack</th>
<th>Intalgre 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>32 - 63</td>
<td>483 (19&quot;)</td>
<td>747</td>
</tr>
<tr>
<td></td>
<td>63 - 100</td>
<td>483 (19&quot;)</td>
<td>648</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>400</td>
<td>586</td>
</tr>
<tr>
<td></td>
<td>300 - 400</td>
<td>600</td>
<td>586</td>
</tr>
<tr>
<td></td>
<td>600</td>
<td>800</td>
<td>586</td>
</tr>
<tr>
<td></td>
<td>800 - 1000</td>
<td>1000</td>
<td>586</td>
</tr>
<tr>
<td></td>
<td>1250 - 1800</td>
<td>910</td>
<td>815</td>
</tr>
<tr>
<td>3 phases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>500</td>
<td>600 (f)</td>
</tr>
<tr>
<td></td>
<td>300 - 400</td>
<td>700</td>
<td>600 (f)</td>
</tr>
<tr>
<td></td>
<td>600</td>
<td>900</td>
<td>600 (f)</td>
</tr>
<tr>
<td></td>
<td>800 - 1000</td>
<td>1400</td>
<td>950 (f)</td>
</tr>
<tr>
<td></td>
<td>1250 - 1600</td>
<td>2010</td>
<td>815</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.

Advantages
> Rack servers
> IT networking
> Hubs & routers

Certifications
RoHS COMPLIANT
Automatic Transfer System

STATYS XS

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

Advantages
- 19" NON-STOP
- Certifications
  - RoHS COMPLIANT

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>
<tr>
<td>CONNECTIONS</td>
<td></td>
</tr>
<tr>
<td>Input</td>
<td>2x IEC C20 (16 A)</td>
</tr>
<tr>
<td>Output</td>
<td>1x IEC C19 (16 A), 8x IEC C13 (10 A)</td>
</tr>
<tr>
<td>COMMUNICATION AND USER INTERFACES</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>LCD display</td>
</tr>
<tr>
<td>Standard communication features</td>
<td>slot for optional communication board, 5 dry contacts (voltage-free, configurable), setup connection port for configuration tool</td>
</tr>
<tr>
<td>Communication options</td>
<td>SNMP card, RS485 card</td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td></td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>up to +40°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5% to 90% without condensation</td>
</tr>
<tr>
<td>Acoustic level at 1 m (ISO 3746)</td>
<td>&lt; 25 dBA</td>
</tr>
<tr>
<td>MECHANICAL SPECIFICATIONS</td>
<td></td>
</tr>
<tr>
<td>Dimensions W x D x H</td>
<td>440 (19&quot;) x 285 x 44 mm (1U)</td>
</tr>
<tr>
<td>Weight</td>
<td>4 kg</td>
</tr>
<tr>
<td>STANDARDS</td>
<td></td>
</tr>
<tr>
<td>Directives</td>
<td>2014/35/UE, 2014/30/UE</td>
</tr>
<tr>
<td>Standards</td>
<td>CE, CEM EN 62310-2</td>
</tr>
<tr>
<td>Environmental</td>
<td>WEEE, RoHS</td>
</tr>
<tr>
<td>Product declaration</td>
<td>CE</td>
</tr>
</tbody>
</table>
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.

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 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

www.socomec.com/services
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.

Distributed redundancy

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

Technical data

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).

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

MODEL

<table>
<thead>
<tr>
<th>IT SWITCH</th>
<th>HA 19&quot; rack</th>
<th>HA-E 19&quot; extractable rack</th>
</tr>
</thead>
<tbody>
<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>adjustable (factory setting ±15 %)</td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>±10% adjustable</td>
<td>50 or 60 Hz</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>20 / 15 kA&lt;sup&gt;1&lt;/sup&gt;</td>
<td>up to 4</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP21</td>
<td></td>
</tr>
</tbody>
</table>

MECHANICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Dimensions W x D x H</th>
<th>448&lt;sup&gt;2&lt;/sup&gt; x 310 x 131 mm</th>
<th>448&lt;sup&gt;2&lt;/sup&gt; x 400 x 133 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>8.5 kg</td>
<td>14 kg</td>
</tr>
<tr>
<td>Cooling</td>
<td>Natural</td>
<td>-</td>
</tr>
</tbody>
</table>

<sup>1</sup> Depending on model - (2) 484 mm with front fixing squares (19" rack integrable)
### 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>LOCAL VIEW</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| • Local UPS monitoring  
| • Local PC shutdown management | • Local UPS monitoring software.  
| | USB or RS-232 serial port.  
| | Clear, immediate and detailed information on the status of the UPS.  
| | Automatic system shutdown in the event of a prolonged power cut.  
| | Protection from data loss and system damage.  
| | For Microsoft Windows, Linux and MacOS.  
| | Free download from www.socomec.com |
| **NET VISION**   |           |                            |
| • Remote UPS monitoring  
| • Remote server shutdown management | • Ethernet interface for remote UPS monitoring and server-based workstations shutdown management via web browser.  
| | Specifically designed for business networks.  
| | Direct interface between the UPS and Ethernet network with no dependence on the server.  
| | Compatible with all networks and most operating systems. |
| **JNC**          |           |                            |
| • Remote server, hosts and virtual machine shutdown management | • Software for controlled network server shutdown.  
| | Shutdown Client installed on the remote server:  
| | - warns user during shutdown procedure,  
| | - can execute specific script before shutting down the Operating System,  
| | - performs Operating System shutdown,  
| | • For Microsoft Windows, Linux and MacOS operating systems.  
| | Free download from www.socomec.com |
| **REMOTE VIEW PRO** | |                            |
| • UPS and STS supervision | • Supervision software dedicated to UPS or STS provided with Ethernet connection and SNMP protocol.  
| | Remote UPS and STS monitoring from any computer connected on the same network, LAN or WAN architecture via web browser.  
| | Compliant with all SOCOMEC UPS and STS and with almost all UPS manufacturers using RFC1628 MIB file.  
| | Compliant with Windows server with Internet Information Service. |
| **COMMUNICATION INTERFACES** | |                            |
| • Communication capability in various environments | • Compatible with industrial PROFIBUS and PROFINET systems.  
| | Compatible with BACNET BMS monitoring.  
| | MODBUS TCP compliance for SCADA system. |
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

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)

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
- STATYS

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.
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.
Power Management Solution
monitored and managed rack PDU

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>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>
</tbody>
</table>

**INPUT**

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>200-240 V (1ph)</th>
<th>346-415 V (3ph, Y+N)</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

**OUTPUT**

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>200-240 V</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectors</td>
<td>(2) IEC320-C13, (4) IEC320-C19</td>
<td>(3) IEC320-C13, (3) IEC320-C19</td>
</tr>
</tbody>
</table>

**COMMUNICATION**

<table>
<thead>
<tr>
<th>Interfaces</th>
<th>RS232 - (WEB/SNMP optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental sensor</td>
<td>•</td>
</tr>
</tbody>
</table>

**ENVIRONMENT**

<table>
<thead>
<tr>
<th>Operating ambient temperature</th>
<th>0 to 45 °C</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

**RACK PDU**

<table>
<thead>
<tr>
<th>Dimensions W x D x H</th>
<th>48 x 1250 x 50 mm</th>
<th>48 x 1580 x 50 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>5.4 kg</td>
<td>6.0 kg</td>
</tr>
</tbody>
</table>
Technology

Power protection vs. UPS topology ................................................................. p.108
Solutions to meet availability and flexibility performance ................................ p.110
Solutions to meet availability and energy saving performance ......................... p.112
UPS technologies ......................................................................................... p.114
Static Transfer Systems (STS) for high availability architecture ..................... p.115
Backup storage .............................................................................................. p.117
Different backup storage for UPS systems ..................................................... p.118
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.
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Modern technology offers various solutions to ensure the power quality; static UPS systems are undoubtedly the most versatile and

How to ensure the power quality: the UPS

- asymmetry in the supply voltage system.
- flicker due to large intermittent loads,
- short voltage variations due to the connection of heavy loads or the presence of faults in the network,
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- as the mission-critical applications themselves, however, is the quality of the supplied power.

Although today's Data Centres are all designed with a high level of inherent redundancy in order to minimise downtime, just as important

It's widely understood that mission-critical facilities must run continuously, and, of course, that any power interruption, even for a short

The increased sensitivity of the vast majority of processes (industrial, services and even residential) to PQ problems means that the

Along with advances in technology, the organisation of the worldwide economy has evolved towards globalisation and the profit margins

nature of electrical loads. These loads are both the major root causes of - and the major casualties of – power quality problems. Due to

Electronics including programmable logic controllers (PLC) and energy-efficient lighting - have led to a complete transformation in the

Voltage and Frequency Independent - This is the only UPS working-mode that assures total load protection against all possible mains

Voltage Independent - The load is supplied by the mains power supply and protected against under and over voltages by an AVR

Voltage and Frequency Dependent - Utilities are normally powered by the mains supply. In the event of power loss the load is

The table below shows the correlation between the types of disturbance, their possible causes, the consequences they can entail, and the recommended UPS topology (VFD, VI, VFI) to mitigate them.

<table>
<thead>
<tr>
<th>Disturbance type</th>
<th>Wave form</th>
<th>Possible 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, lighting 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 ASDs, 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.).
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### 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.

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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 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 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.

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.

Fast EcoMode

<table>
<thead>
<tr>
<th>Grid voltage within the tolerance</th>
<th>Grid voltage out of tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 ms</td>
<td>2 ms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>η</th>
<th>0.25</th>
<th>0.5</th>
<th>0.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The load is shared by all the UPS

Two UPS in operation and two UPS on hot stand-by

Energy Saver enables the increased efficiency of the whole system to be maintained.

Energy Saver mode for global efficiency improvement on parallel systems.

This type of operation is perfectly suited to applications subject to frequent variations in power.

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Energy Saver

- This function optimizes the efficiency (η) 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.

Solution to meet availability and energy saving performance
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.
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.
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.

### Expert Battery System (EBS)

**Technology**

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.
Back-up storage

Expert Battery System: protecting your battery investment

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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/5 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 that 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:
  \[ \text{SoC} = \frac{\text{Remaining capacity}}{\text{Rated capacity}} = 1 - \text{DoD} \]
- DoD + 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)
Different back-up storage for UPS systems

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.

Super capacitors / Ultracapacitors

There are a number of different technologies that fall under the name ‘super capacitors’ or ‘ultracapacitors’. The 2 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 wide 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 grid power) but not in cases 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.
Socomec: our innovations supporting your energy performance

1 independent manufacturer
3,200 employees worldwide
10% of sales revenue dedicated to R&D
400 experts dedicated to service provision

Your power management expert

POWER SWITCHING
POWER MONITORING
POWER CONVERSION
EXPERT SERVICES

The specialist for critical applications

- Control, command of LV facilities
- Safety of persons and assets
- Measurement of electrical parameters
- Energy management
- Energy quality
- Energy availability
- Energy storage
- Prevention and repairs
- Measurement and analysis
- Optimisation
- Consultancy, commissioning and training

A worldwide presence

8 production sites
- France (x3)
- Italy
- Tunisia
- India
- China (x2)

27 subsidiaries
- Australia
- Belgium
- China
- France
- Germany
- India
- Italy
- Netherlands
- Poland
- Romania
- Singapore
- Slovenia
- Spain
- Switzerland
- Thailand
- Tunisia
- Turkey
- UK
- USA

80 countries where our brand is distributed

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