# *DELPHYS BC*

160 to 300 kVA

socomec

Innovative Power Solutions

# OBJECTIVES

The aim of these specifications is to provide:

- the information required to choose the right uninterruptible power supply for a specific application.
- the information required to prepare the system and installation site.

The specifications are intended for:

- installation engineers.
- design engineers.
- engineering consultants.

# INSTALLATION REQUIREMENTS AND PROTECTION

Connection to the mains power supply and to the load(s) must be made using cables of suitable size, in accordance with current standards. If not already present, an electrical control station which can isolate the network upstream of the UPS must be installed. This electrical control station must be equipped with a  circuit breaker (or two, if there is a separate bypass line) of an appropriate rating for the power draw at full load.

If an external manual bypass is required, only the model supplied by the manufacturer must be installed.

We recommend fitting two metres of unanchored flexible cable between the UPS output terminals and the cable anchor (wall or cabinet). This makes it possible to move and service the UPS.

For detailed information, see the installation and operating manual.

# 1. ARCHITECTURE

## 1.1. Range

DELPHYS BC is a full range of high performing UPS designed to protect critical and sensitive appliances in “business critical” applications such as data centres.

| Models | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| DELPHYS BC 3/3 | • | • | • |

*Matrix table for model and kVA power rating*

Each range has been specifically designed to meet the demands of loads in specific application contexts, in order to optimise the features of the product and to facilitate its integration within the system.

# 2. FLEXIBILITY

## 2.1. Power ratings from 160 to 300 kVA

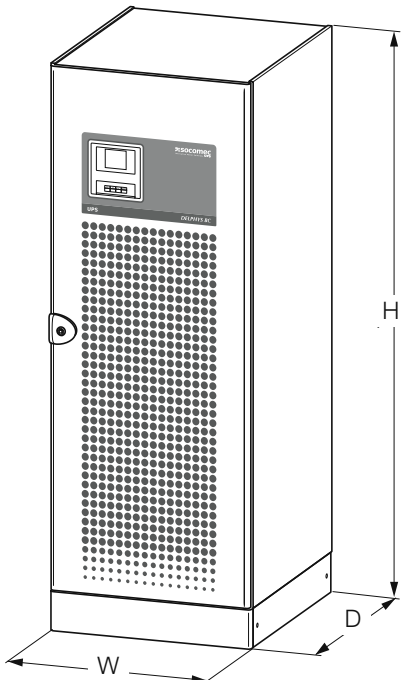
The equipment has been designed with a minimum direct and indirect footprint (the actual space occupied by the unit and the space required around it for maintenance, ventilation and access to the operating mechanisms and communication devices).

The careful design also provides easy access for maintenance and installation.

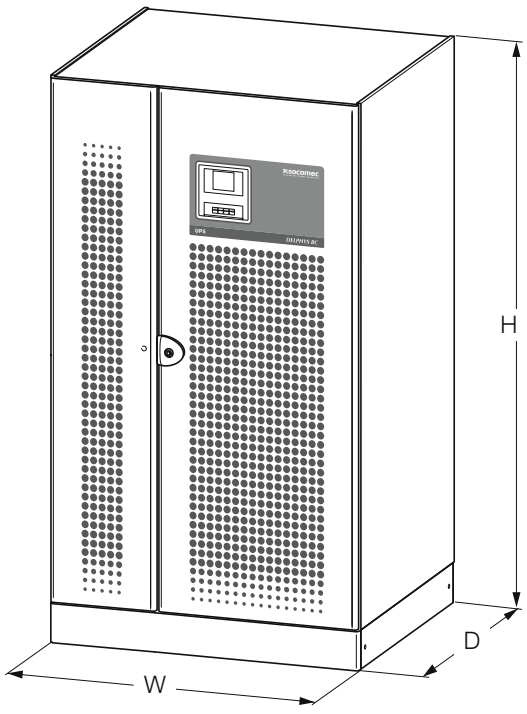
All of the control mechanisms are located in the front bottom side, while the communication interfaces in the internal upper side of the door.

The air inlet is on the front, with outflow from the upper side; this means other equipment or external battery enclosures can be placed alongside the UPS unit.

| Dimensions | | | |
|---|---|---|---|
| | Width (W) [mm] | Depth (D) [mm] | Height (H) [mm] |
| DELPHYS BC 160 and 200 kVA | 700 | 800 | 1930 |
| DELPHYS BC 300 kVA | 1000 | 950 | 1930 |




DELPHYS BC 160 kVA
DELPHYS BC 200 kVA




DELPHYS BC 300 kVA

## 2.2. Battery management

Available with distributed batteries, DELPHYS BC allows to optimise the batteries size thanks to a 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 the amount of lead.

To guarantee maximum back-up time availability and battery life, DELPHYS BC includes:

- EBS (Expert Battery System), smart battery charging management.
- **Distributed** or **shared battery** for energy storage optimization on parallel systems.

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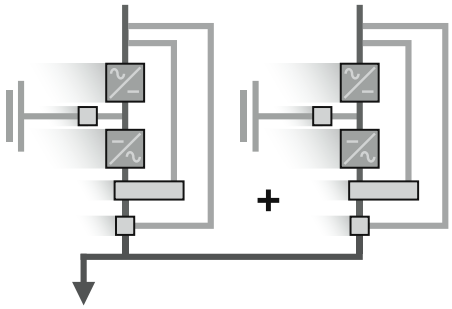
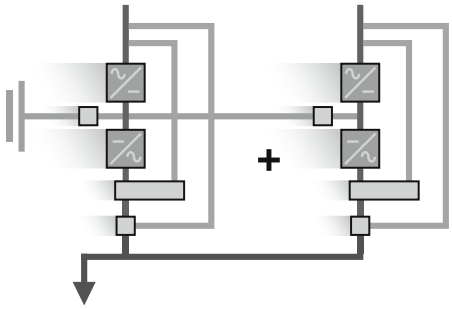
|  |  |
| Distributed battery | Shared battery |

## 2.3. Horizontal and vertical parallel

DELPHYS BC offers 2 “configurations” of UPS in the same range.

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.

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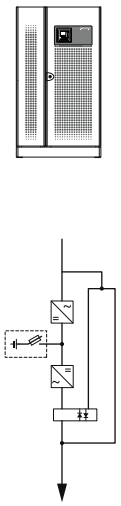
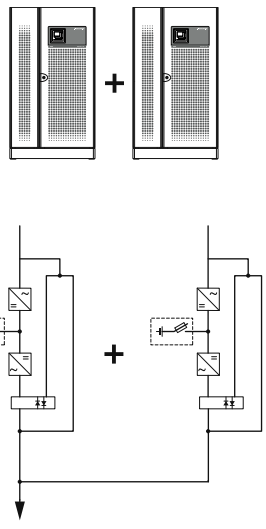
|  |  |
| Single unit configuration | 1+1 redundant configuration |

# 3. STANDARD AND OPTIONS

## 3.1. Standard electrical features.

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

## 3.2. Electrical options.

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

## 3.3. Standard communication features.

- 2 slots for communication options.

## 3.4. 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.

## 3.5. Remote monitoring service.

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

# 4. SPECIFICATIONS

## 4.1. Installation parameters

| Installation paramenters | | | | |
|---|---|---|---|---|
| Rated power (kVA) | | 160 | 200 | 300 |
| Phase in/out | | 3/3 | | |
| Active power (kW) | | 144 | 180 | 270 |
| Rated/maximum rectifier input current (EN 62040-3) (A) | | 220/290 | 278/340 | 417/425 |
| Rated bypass input current (A) | | 232 | 290 | 433 |
| Inverter output current @ 400 V (A) P/N | | 232 | 290 | 433 |
| Maximum air flow ($m^3/h$) | | 2250 | | 2700 |
| Sound level (dBA) | | < 68 | | < 71 |
| Power dissipation in nominal conditions[1] | W | 9200 | 11500 | 17300 |
| | kcal/h | 7911 | 9888 | 14875 |
| | BTU/h | 31391 | 39239 | 59029 |
| Power dissipation (max) in the worst conditions[2] | W | 10600 | 13300 | 18000 |
| | kcal/h | 9114 | 11436 | 15477 |
| | BTU/h | 36168 | 45380 | 61418 |
| Dimensions | W (mm) | 700 | | 1000 |
| | D (mm) | 800 | | 950 |
| | H (mm) | 1930 | | 1930 |
| Weight (kg) | | 480 | 500 | 830 |

(1) Considering nominal input current (400 V, battery charged) and rated output active power (PF 0.9).

(2) Considering maximum input current (low input voltage, battery recharge) and rated output active power (PF 0.9).

## 4.2. Electrical characteristics

| Electrical characteristics - **Rectifier[1] Input** | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| Rated mains supply voltage | 400 V 3ph | | |
| Voltage tolerance | 240 to 480 V[2] | | |
| Rated frequency | 50/60 Hz (selectable) | | |
| Frequency tolerance | ±10% | | |
| Power factor (input at full load and rated voltage) | ≥ 0.99 | | |
| Total harmonic distortion (THDi) | < 3% | | |
| Max inrush current at start-up | <In (no overcurrent) | | |

(1) IGBT rectifier. (2) Conditions apply.

| Electrical characteristics - **Bypass** | | | | |
|---|---|---|---|---|
| Rated power (kVA) | | 160 | 200 | 300 |
| Bypass frequency variation speed | | 1.5 Hz/s (settable up to 3 Hz/s) | | |
| Bypass rated voltage | | Nominal output voltage ±15% | | |
| Bypass rated frequency | | 50/60 Hz (selectable) | | |
| Bypass frequency tolerance | | from ±1% to ±8% (operation with generator unit) | | |

| Electrical characteristics - **Inverter** | | | | |
|---|---|---|---|---|
| Rated power (kVA) | | 160 | 200 | 300 |
| Rated output voltage (selectable) | | 380/400/415 V | | 400/415 V |
| Output voltage tolerance | | Static: ±1%<br>Dynamic: VF-SS-111 (EN 62040-3) compliant | | |
| Rated output frequency (selectable) | | 50/60 Hz (selectable) | | |
| Output frequency tolerance | | ±0.01% on mains power failure | | |
| Load crest factor (according to IEC 62040-3) | | 3:1 | | |
| Voltage harmonic distortion | | < 1.5% with linear load | | |
| Overload tolerated by the inverter - 25 °C | 1 min | 225 kW | 270 kW | 311 kW |

| Electrical characteristics - **Efficiency** | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| Double conversion efficiency (normal mode) - full load | up to 94% | | |

| Electrical characteristics - **Environment** | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| Storage temperatures | -5 to +45 °C (23 to 113 °F) (15 to 25 °C for better battery life) | | |
| Working temperature | 0 to +40(1) °C (32 to 104 °F) (15 to 25 °C for better battery life) | | |
| Maximum relative humidity (non-condensing) | 95% | | |
| Maximum altitude without derating | 1000 m (3300 ft) | | |
| Degree of protection | IP20 | | |
| Colour | RAL 7012, silver grey frontal door | | |

(1) Conditions apply.

## 4.3. Recommended protections

| RECOMMENDED PROTECTION DEVICES - **Rectifier**[1] | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| D curve circuit breaker (A) | 315 | 400 | 630 |
| gG fuse (A) | 315 | 400 | 630 |

| RECOMMENDED PROTECTION DEVICES - **General bypass**[1] | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| Maximum $I^2t$ supported by the bypass ($A^2s$) | 320000 | | |
| Icc max (A) | 8000 | | |
| D curve circuit breaker (A) | 400 | | 630 |
| gG fuse (A) | 400 | | 630 |

| RECOMMENDED PROTECTION DEVICES - **Input residual current circuit breaker**[2] | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| Input residual current circuit breaker | 3 A | | |

| RECOMMENDED PROTECTION DEVICES - **Output**[3] | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| Short-circuit inverter current (A) - (0 to 100 ms) (when AUX MAINS is not present) | 720 A | | 900 |
| C curve circuit breaker[3] (A) | ≤ 63 A | | ≤ 80 |
| B curve circuit breaker[3] (A) | ≤ 125 A | | - |
| High-speed fuse[3] (A) | ≤ 160 A | | |

| CABLES CONNECTION - **Maximum capability per pole** | | | |
|---|---|---|---|
| Rated power (kVA) | 160 | 200 | 300 |
| Rectifier terminals | 2 x 150 $mm^2$ | | 2 x 240 $mm^2$ |
| Bypass terminals | 2 x 150 $mm^2$ | | 2 x 240 $mm^2$ |
| Battery terminals | 2 x 240 $mm^2$ | | 2 x 240 $mm^2$ |
| Output terminals | 2 x 150 $mm^2$ | | 2 x 240 $mm^2$ |

(1) Rectifier protection should only be considered in the event of separate inputs. The bypass protection is given by recommendation. When the bypass and rectifier inputs are combined (common input), the general input protection rating must be the highest of both (bypass or rectifier).

(2) Must be selective with residual current circuit breakers downstream of the UPS connected to the UPS output. If the bypass network is separate from the rectifier circuit, or in the event of parallel UPS, use a single residual current circuit breaker upstream of the UPS.

(3) Selectivity of distribution after the UPS with inverter short-circuit current (short-circuit with AUX MAINS not present). The rating of the protection can be increased by “n” times downstream a parallel UPS system, with “n” equal to the number of parallel modules.

# 5. REFERENCE STANDARDS AND DIRECTIVES

## 5.1. Overview

The construction of the equipment and choice of materials and components comply with all laws, decrees, directives and standards currently in force.

In particular, the equipment is fully compliant with all European Directives concerning CE marking.

2006/95/EC

Council Directive 2006/95/EC, dated 16 February 2007, on the reconciliation of legislation within Member States regarding electrical material for use within specific voltage ranges.

2004/108/EC

On the approximation of the laws of the Member States relating to electromagnetic compatibility

## 5.2. Standards

### 5.2.1. Electromagnetic compatibility

"Electromagnetic Compatibility Provisions (EMC)"

EN 62040-2 Electromagnetic compatibility (C3 category)

### 5.2.2. Safety

"General and safety requirements for UPS used in operator access areas"

| | |
|---|---|
| EN 60950-1 | General and safety requirements for equipment used in operator access areas |
| EN 62040-1 | General and safety requirements for UPS used in restricted access locations |
| EN 60529 | Degrees of protection provided by enclosures |

### 5.2.3. Type and performances

"Performance requirements and methods of test"

| | |
|---|---|
| EN 62040-3 | Uninterruptible power systems (UPS). Methods of specifying the performance and test requirements |

## 5.3. System and installation guidelines

The regulations refer to the unit (UPS) to which the manufacturer must comply with. The UPS engineer adhere's to current legislation for the specific electrical system (e.g. EN 60364).