DELPHYS **MP** *elite*

80 to 200 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 MP ELITE is a high performing transformer based UPS designed to secure power supply to critical industrial applications. It is the ideal solution for grouping with generator sets without using an excessively large generator.

The isolation transformer installed on the inverter output ensures complete galvanic isolation between DC circuit and load output.

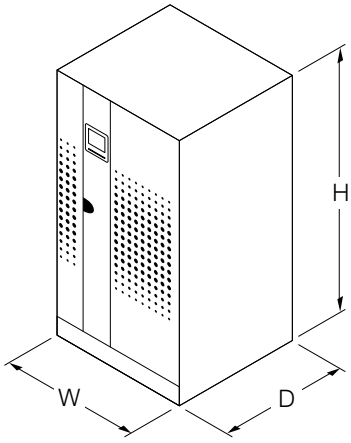
Models					
Rated power (kVA)	80	100	120	160	200
DELPHYS MP ELITE 3/3	•	•	•	•	•

Matrix table for model and kVA power rating

DELPHYS MP ELITE 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 80 to 200 kVA

Dimensions			
Cabinet type	Width (W) [mm]	Depth (D) [mm]	Height (H) [mm]
	1000	800	1930

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 and communication interfaces are located and can be accessed in the front part,
- 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.

2.2. Flexible backup time

Selection of the back-up time is flexible thanks to the wide range of DC bus voltages. The batteries are organised internally into racks based on their relative sizes, so as to ensure a compact unit while still guaranteeing substantial backup times.

To guarantee maximum back-up time availability and battery life, the DELPHYS MP ELITE includes EBS system smart battery charging management.

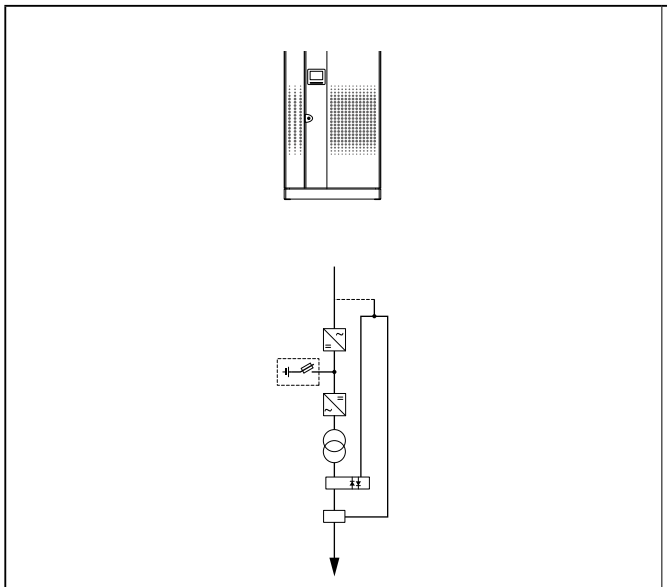
2.3. UPS and system architectures

DELPHYS MP ELITE UPS units (rectifier, battery, inverter and bypass) can be connected in parallel (up to 6 units) with distributed or central bypass.

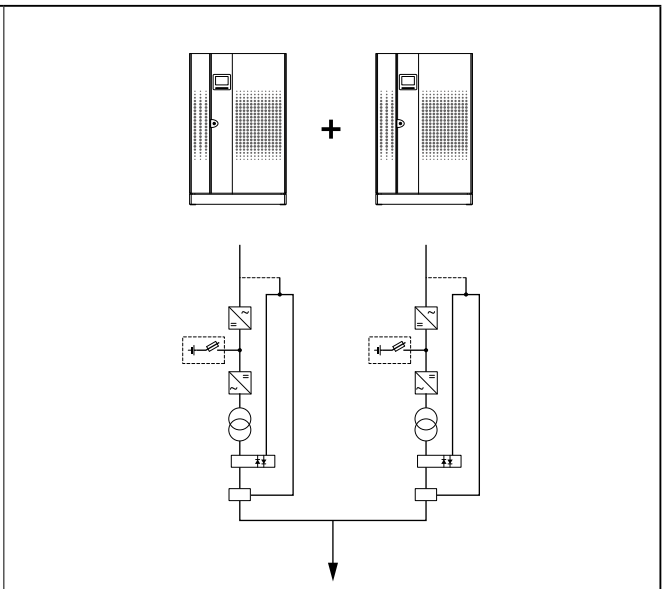
This solution, which is ideally suited for N+1 redundancy, offers flexible power upgrading and enables stand-alone UPS units to be expanded.

Each single UPS unit has a built-in maintenance bypass (single unit or distributed bypass).

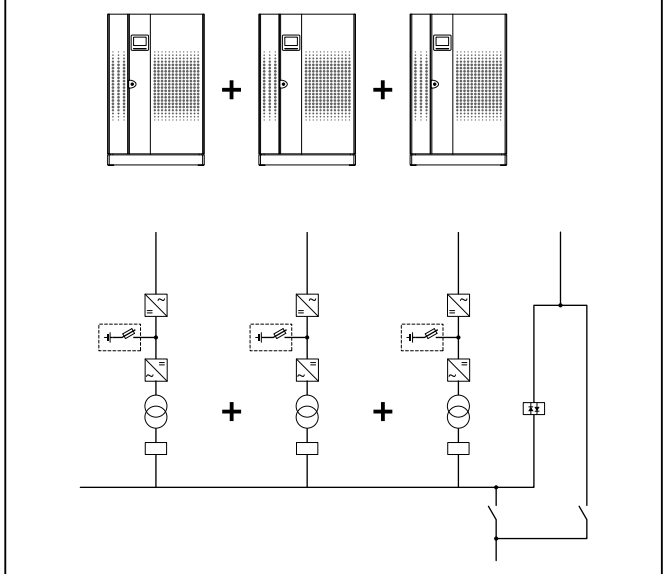
It is possible to add an external maintenance bypass, common to all of the UPS units, for maintenance access. A central bypass configuration has a common maintenance bypass for the complete system.



Single unit configuration



1+1 redundant configuration



Modular parallel UPS with centralized bypass

3. STANDARD AND OPTIONS

3.1. Standard electrical features.

• Slots for 6 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).
• Parallel connection up to 6 units.

3.2. Electrical options.

• EBS (Expert Battery System).
• FLYWHEEL compatible.
• ACS synchronisation system.
• Redundant electronic power supplies.

3.3. Mechanical options.

• Reinforced IP protection degree.
• Ventilation filters.
• Redundant ventilation with failure detection.
• Top entry connection.

3.4. Standard communication features.

• Multilanguage graphic display.
• Embedded dry contacts.

3.5. Communication options.

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

3.6. 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)		80	100	120	160	200
Phase in/out		3/3				
Active power (kW)		64	80	96	128	160
Rated/maximum rectifier input current (EN 62040-3) (A)		114/128	142/151	177/182	228/242	300/382
Rated bypass input current (A)		161	144	174	216	290
Inverter output current @230V (A) P/N		116	144	174	232	290
Maximum air flow (m^3/h)		2000			2400	
Sound level (dBA)		65		67		
Dissipation at rated load (minimum mains power present and batteries charged)	W	5700	6500	8500	10200	15400
	kcal/h	4900	5600	7300	8800	13200
	BTU/h	19450	22250	29000	34950	52400
Dimensions (with standard back-up time)	W (mm)	1000				
	D (mm)	800				
	H (mm)	1930				
Weight (kg)		740	860		1020	

4.2. Electrical characteristics

Electrical characteristics - **Input**					
Rated power (kVA)	80	100	120	160	200
Phase in/out	3/3	3/3	3/3	3/3	3/3
Rated mains supply voltage	380/400/415 V (208/220/240 V on request)				
Voltage tolerance (ensuring battery recharge)	-12% to +15%(380 V) / ±15% (400 V) / -15% to +10% (415 V)				
Rated frequency	50/60 Hz				
Frequency tolerance	± 5 Hz				
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)				
Soft start	50 A/sec (settable)				

Electrical characteristics - **Bypass**					
Rated power (kVA)	80	100	120	160	200
Bypass frequency variation speed	2 Hz/s (settable)				
Bypass rated voltage	Rated output voltage ±10% (settable)				
Bypass rated frequency	50/60 Hz (selectable)				
Bypass frequency tolerance	±2 Hz (from 0.2 to 4 Hz settable (operation with generator unit))				

Electrical characteristics - **Inverter**					
Rated power (kVA)	80	100	120	160	200
Rated output voltage (selectable)	380/400/415 V (1)				
Output voltage tolerance	Static: ±1% Dynamic: (0-100% Pn) -4% +2%				
Rated output frequency	50/60 Hz (selectable)				
Autonomous frequency tolerance	0.02 on mains power failure				
Load crest factor	3:1				
Voltage harmonic distortion	< 2% on linear load < 4% with non linear load				
Overload tolerated by the inverter (with mains power present)	125% x 10 min 150% x 1 min				

(1) Other voltages on request.

Electrical characteristics - **Efficiency**					
Rated power (kVA)	80	100	120	160	200
Double conversion efficiency (normal mode)	93.5% @ full load				
Efficiency in Eco Mode	98%				

Electrical characteristics - **Environment**					
Rated power (kVA)	80	100	120	160	200
Storage temperatures	-20 to +70 °C (-4 to 158 °F) (15 to 25 °C for better battery life)				
Working temperature	0 to +35 °C (32 to 95 °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 (other IP as option)				
Portability	EN 60068-2				
Colour	RAL 9006 (Grey Toyo)				

4.2.1. Recommended protection devices

RECOMMENDED PROTECTION DEVICES - **Rectifier**[1]					
Rated power (kVA)	80	100	120	160	200
D curve circuit breaker (A)	125	160	200	250	400
gG fuse (A)	125	160	200	250	400

RECOMMENDED PROTECTION DEVICES - **General bypass**[1]					
Rated power (kVA)	80	100	120	160	200
Maximum I^2t supported by the bypass (A^2s)	160000	250000		640000	
Icc max (A)	4000	5000		8000	
D curve circuit breaker (A)	160	200	250	400	
gG fuse (A)	160	200	250	400	

RECOMMENDED PROTECTION DEVICES - **Input residual current circuit breaker**[2]					
Rated power (kVA)	80	100	120	160	200
Input residual current circuit breaker	0.5 A				

RECOMMENDED PROTECTION DEVICES - **Output**[3]					
Rated power (kVA)	80	100	120	160	200
Short-circuit inverter current (A) - (0 to 100 ms) (when AUX MAINS is not present)	485	620		1060	
C curve circuit breaker[3] (A)	40	50		100	
High-speed fuse[3] (A)	80	125		250	

CABLES - **Maximum cable section**					
Rated power (kVA)	80	100	120	160	200
Rectifier terminals	Copper bar 63 x 4 mm (2x120 mm)				
Bypass terminals					
Battery terminals	Copper bar 40 x 5 mm (2x240 mm)				
Output terminals	Copper bar 63 x 4 mm (2x120 mm)				

(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 current 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 (class C3 standard - C2 optional)
EN 61000-2-2	Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems
EN 61000-4-2	Electrostatic discharge immunity test,
EN 61000-4-3	Radiated radio-frequency electromagnetic field immunity test,
EN 61000-4-4	Electrical fast transient/burst immunity test,
EN 61000-4-5	Surge immunity test,
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields.
EN 55011 class A	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.

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 60439-1	Low-voltage switchgear and controlgear assemblies - Part 1: Type-tested and partially type-tested assemblies,
EN 50272-2	Safety requirements for secondary batteries and battery installations
EN 60896-1	Stationary lead-acid batteries. General requirements and methods of test. Part 1: Vented types
EN 60896-2	Stationary lead-acid batteries. General requirements and methods of test. Part 1: Valve-regulated types
EN 60146	Semiconductor convertors
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) and the manufacturer is therefore obliged to comply with them. The UPS engineer adhere's to current legislation on installation for the specific electrical system (e.g. EN 60364).