

# DELPHYS XM

300 to 800 kVA/kW



**SUPERIOR**

Unrivalled power  
performance



Socomec Resource Center  
To download, brochures, catalogues  
and technical manuals

# 1. 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.

## 2. 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.

For detailed information, see the installation and operating manual.

## 3. ARCHITECTURE

### 3.1. Range

DELPHYS XM is a full range of high performing UPS (Uninterruptible Power Supply) designed to secure highly critical applications and therefore to ensure business continuity by means of a fully resilient architecture. It has been specifically designed to meet the stringent demands of loads in particular application contexts, in order to optimize the features of the product and to facilitate its integration within the system.

The DELPHYS XM can deliver many more benefits than standard systems, packing into an overall space-saving design, providing:

- Fault tolerant architecture, and possibility to set N+1 internal redundancy,
- Minimize the footprint thanks to high power density,
- Easy and fast maintenance,
- Reduce the electrical infrastructure's total cost of ownership,
- Fast deployment time / Flexible installation.

RATED POWER (KVA)	300	400	500	600	800
DELPHYS XM	•	•	•	•	•

DELPHYS XM is designed by 100 kW power conversion modules combined with a common static bypass rated for permanent operation at the rated power of the UPS. The UPS is designed with mechanical and electrical segregation solution, so that any abnormal event will be contained to the related brick and not propagated to the rest of the unit.

To increase the system power, DELPHYS XM can be parallelized up to 6 units, for a maximum of 3,6 MW (6 x 600 kW). The 800 kW size can be parallelized up to 4 units, for a maximum of 3,2 MW.

### 3.2. Intrinsic redundancy

The UPS is designed to provide intrinsic double conversion mode redundancy in case of a single power module is no longer available, to grant a minimum of capability to supply the connected load.

Any potential module fault should be isolated, keeping the critical load protected in double conversion mode thanks to the remaining power converters to maximize the Mean Time Between Critical Failure.

UPS RATING		300	400	500	600	800
Number of 100 kW modules		3	4	5	6	8
N configuration	Rated power kVA	300	400	500	600	800
	Intrinsic redundancy up to % of rated power	66%	75%	80%	83%	87%
N+1 configuration	Rated power kVA	200	300	400	500	700
	Intrinsic redundancy up to % of rated power	100%				

N+1 configuration setting available on HMI.

### 3.3. Energy efficiency

DELPHYS XM solution allow reducing energy consumption to minimize GHD emission and operation bill, thanks to:

- High efficiency in double conversion mode, under wide load rate range,
- Energy saver mode to maximize the online double conversion efficiency under low load condition, by switching automatically into hot-standby the modules which are not required to supply the load.
- Line interactive mode allowing to automatically select the most optimized working mode : double conversion or line interactive mode according to the input network conditions. In this mode, a specific algorithm monitors in real time the network quality and selects the optimum working mode between Double Conversion (VFI) and Line Interactive (LI).

### 3.4. Maintainability

The equipment is designed to minimize MTTR trough:

- Full front access to easier maintenance activities,
- Possibility for Socomec service engineers to extract online a power conversion module (conditioned by the load rate and redundancy level) in order to maintain the concerned modules without the need to move the load on maintenance bypass,
- Withdrawable static bypass subassembly to easier access and avoid cabling operation when required to maintain the bypass line static switch subassembly.
- UPS heat run test - without the need of dummy load bench - allowing to certify the commissioning and advanced maintenance operations performed by Socomec service engineers.

### 3.5. Integrated Switches

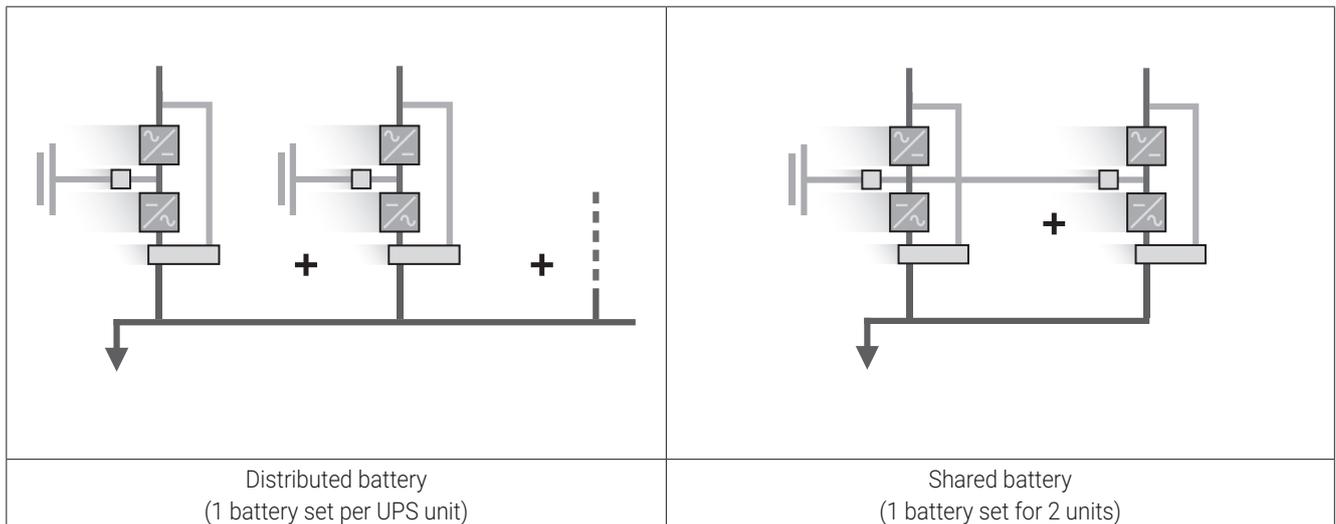
RATED POWER (KVA)	300	400	500	600	800
Number of 100 kW modules	3	4	5	6	8
Input rectifier switch	•	•	•	•	- (1)
Input bypass switch	•	•	•	•	- (1)
Output switch	•	•	•	•	- (1)
Maintenance bypass switch	• (Single unit only)				- (2)

(1) Available only for bottom connection variant.

(2) Available only for bottom connection variant and single unit (not parallel version).

### 3.6. Battery management

Available with distributed batteries when paralleling units, DELPHYS XM allows to optimize the batteries size thanks to a shared battery operation, this can be set by HMI up to 2 units. 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. This function is supported with Lib batteries and direct communication, but not when using dry contacts.



### 3.7. FLEXIBILITY

The equipment has been designed with the aim to reach the best power density to reduce at minimum the 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).

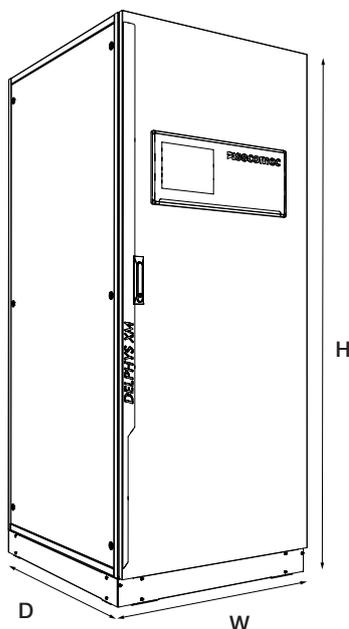
The careful design also provides easy access for maintenance and installation.

For maximum flexibility, the UPS can be adapted to be installed against a wall or back to back, without impacting its footprint, thanks to a specific option (currently available up to 600 kVA).

All of the control mechanisms and communication interfaces are located in the front side and can be accessed from a door provided with handle.

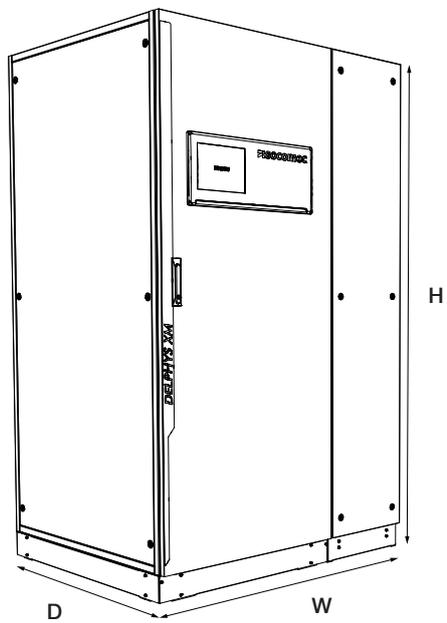
DELPHYS XM TOP CONNECTION						
UPS rating [kVA/kW]		300	400	500	600	800
Number of 100 kW modules		3	4	5	6	8
Width [W]	(mm)	800				
Depth [D]	(mm)	1000				
Height [H]	(mm)	2000				
Weight	(kg)	525	568	660	757	864
Single unit clearances		Rear = 500 mm at 40 °C or 300 mm at 35 °C Lateral = 0 mm Top = 500 mm				
Access for maintenance and operation		Front only				
Installation		Back-to-back installation: 1 m, 0 m with the wall installation kit* Against a wall: with the wall installation kit*				

\* not available for the 800 version



DELPHYS XM BOTTOM CONNECTION						
UPS rating [kVA/kW]		300	400	500	600	800
Number of 100 kW modules		3	4	5	6	8
Width [W]	(mm)	1200				1600
Depth [D]	(mm)	1000				
Height [H]	(mm)	2000				
Weight	(kg)	580	623	715	899	1251
Single unit clearances		Rear = 500 mm at 40 °C or 300 mm at 35 °C Lateral = 0 mm Top = 500 mm				
Access for maintenance and operation		Front only				
Installation		Back-to-back installation: 1 m, 0 m with the wall installation kit* Against a wall: with the wall installation kit*				

\* not available for 800 version



## 4. STANDARD AND OPTIONS

### 4.1. STANDARD ELECTRICAL FEATURES

---

- Separated or common input mains
- Top entry connection
- Compatible with VRLA and Li-Ion energy storage technologies
- Inputs and output switches for single and parallel units (300-600 kVA and 800 kW switch version)
- Maintenance bypass switch for single unit (300-600 kVA and 800 kW switch version)
- High battery charging capacity (up to 100 A)
- TNS grounding system
- Backfeed protection: detection circuit
- Hot-swappable Power Modules
- Withdrawable static bypass
- Smart conversion Mode (LINE INTERACTIVE)
- Energy saver mode
- Cold start
- Conformal coated PCBs

### 4.2. ELECTRICAL OPTIONS

---

- Bottom entry connection (side cabinet up to 500kW, specific product variant for 600 kVA and 800 kVA)
- Full switch version for 800 kW rating
- Kit for top air outlet (300-600 kW)
- PEN kit for TN-C grounding system
- ACS (LBS) synchronization between two DELPHYS XM systems
- Battery temperature sensor for lead batteries
- Parallel cable kit (15 m)

### 4.3. ELECTRICAL OPTIONS

---

- Up to IP3X.

### 4.4. STANDARD COMMUNICATION FEATURES

---

- User-friendly 10" touch-screen multilingual color graphic display
- 3 Com-Slots<sup>(1)</sup> for communication optional card
- Ethernet and USB ports for service purpose
- Embedded contacts: 4 inputs and 6 outputs (programmable) available in the monitor unit

(1) In case of parallel system, 3 slots will be available for the whole system

### 4.5. COMMUNICATION OPTIONS

---

- Com-slots extension (ready for 3 additional plug-in card)
- Dry-contact interface (configurable voltage-free contacts)
- MODBUS RTU RS485 or TCP
- NET VISION: professional WEB/SNMP Ethernet interface for secure UPS monitoring and remote automatic shut-down
- NET VISION EMD: Environment Temperature and Humidity sensor with 2 inputs
- Remote View Pro supervision software.

### 4.6. REMOTE MONITORING AND CLOUD SERVICES

---

- SoLive<sup>(2)</sup>: Real-time cloud monitoring app to supervise any Socomec UPS via smartphone
- SoLink<sup>(2)</sup>: 24/7 cloud remote surveillance service by manufacturer specialists for any Socomec UPS
- Remote operations <sup>(1)</sup>: on-demand remote connection by Socomec experts to perform diagnosis and troubleshooting directly on UPS.

(2) Please check the service availability in your Country.

## 4.7. Electrical options.

RATED POWER (KVA)		300	400	500	600	800
Phase in/out		3/3				
Active power (kW) – N configuration		300	400	500	600	800
Rated / maximum rectifier input current (A)		451/ 593	601 / 791	752 / 989	902 / 1187	1202 / 1583
Rated bypass input current (A)		437	583	729	875	1166
Inverter output current @ 400V (A)		433	577	722	866	1155
Maximum air flow (m3/h)		4084	5445	6806	8168	10890
Sound level (dBA)		≤ 73 dBA				
Power dissipation in nominal conditions <sup>(1)</sup>	W	10.58	13.66	18.35	20.70	27.36
	kcal/h	9098	11748	15777	17798	23524
	BTU/h	36102	46622	62610	70628	93352
Power dissipation (max) in the worst conditions <sup>(2)</sup>	W	13.81	18.41	23.01	27.62	36.82
	kcal/h	11872	15829	19786	23743	31658
	BTU/h	47111	62815	78519	94223	125630

(1) Considering nominal input current (400 V, battery charged) and rated output active power (PF1).

(2) Considering maximum input current (low input voltage, battery recharge) and rated output active power (PF1).

## 4.8. ELECTRICAL CHARACTERISTICS

ELECTRICAL CHARACTERISTICS – RECTIFIER INPUT						
Rated power (kVA)		300	400	500	600	800
Rated mains supply voltage (V)		380/400/415 V (3ph + N)				
Voltage tolerance at full load	30 °C	304 V to 485 V				
	40 °C	323 V to 485 V				
Voltage tolerance with power derating <sup>(1)</sup>		240 V to 485 V				
Rated frequency		50/60 Hz				
Frequency tolerance		40 to 70 Hz				
Power factor		> 0.99				
Total harmonic distortion (THDi) <sup>(2)</sup>		≤ 3%				
Max inrush current at start-up		< I <sub>n</sub> (no overcurrent)				
Soft start (rectifier power walk-in)		Yes				

(1) Conditions apply.

(2) At full load and rated input voltage (THDV < 1%).

ELECTRICAL CHARACTERISTICS – BATTERY						
Rated power (kVA)		300	400	500	600	800
Number of poles		2 wires (+ / -)				
Min/Max number of battery lead battery cells with load PF=1		240/300				
Min/Max number of battery lead battery cells with load PF ≤ 0,9		216/300				
Min/Max number of battery lead battery cells with load PF ≤ 0,8		192/300				
Recharging current at 100% load		Up to 90 A	Up to 120 A	Up to 150 A	Up to 180 A	Up to 240 A
Recharging current at 50% load		Up to 300 A	Up to 400A	Up to 500 A	Up to 600 A	Up to 800 A

ELECTRICAL CHARACTERISTICS - BYPASS						
Rated power (kVA)		300	400	500	600	800
Bypass rated voltage		380/400/415 V configurable / (3ph + N)				
Bypass voltage tolerance		Nominal output voltage $\pm 10\%$ (settable up to $\pm 20\%$ )				
Bypass frequency variation speed		1.5 Hz/s settable from 1 to 3 Hz/s				
Bypass rated frequency		50/60 Hz (selectable)				
Bypass frequency tolerance		$\pm 10\%$ fixed				
Bypass line overload	Permanent	110%				
	10 min	125%				
Semiconductors characteristics	I <sup>2</sup> t (A <sup>2</sup> s)	1 361 000	1 361 000	2 205 000	3 075 000	TBC
	Is/c (A peak)	16 500	16 500	21 000	24 800	TBC

ELECTRICAL CHARACTERISTICS - INVERTER						
Rated power (kVA)		300	400	500	600	800
Rated output voltage (selectable) (V)		380/400/415 V configurable / (3ph + N)				
Output voltage tolerance		Static load $\pm 1\%$ , dynamic load VFI-SS-11 compliant				
Rated output frequency (Hz)		50/60 Hz (selectable)				
Autonomous frequency tolerance		$\pm 0.02$ Hz on mains power failure				
Load crest factor		2,67:1				
Total voltage distortion across 100% linear load		ThdV $\leq 1\%$				
Overload tolerated by the inverter [kVA/kW] <sup>(1)</sup>	60 min	330	440	550	660	880
	10 min	375	500	625	750	1000
	1 min	450	600	750	900	1200

(1) The tolerated output overload corresponds to the inverter capability under defined conditions. The output overload performance is incremented by the static bypass capability (when available).

ELECTRICAL CHARACTERISTICS - EFFICIENCY						
Rated power (kVA)		300	400	500	600	800
Double conversion efficiency		Up to 97.1%				
Smart conversion mode (Line interactive)		Up to 99%				

ENVIRONMENTAL CHARACTERISTICS						
Rated power (kVA)		300	400	500	600	800
Storage temperatures		-25 to +55 °C				
Start-up and working temperature		0 to +40 °C				
Maximum relative humidity		$\leq 95\%$ (non-condensing)				
Cooling air inlet		Frontal				
Cooling air flow	Standard	Rear outlet - requires 500 mm rear space at 40 °C or 300 mm rear space at 35 °C				
	Optional	Top air extraction (without impacting the footprint - no rear space) up to 600kVA rating				
Maximum altitude without derating		1500 m				
Degree of protection - Standard		IP20				
Color		RAL 7016				

## 4.9. RECOMMENDED PROTECTIONS

RECOMMENDED PROTECTION DEVICES - INPUTS					
Rated power (kVA)	300	400	500	600	800
Rectifier input mains (A) <sup>(1)</sup>	630	800	1000	1250	1600
Bypass input mains fuse (A) <sup>(1)</sup>	500	630	800	1000	1250

RECOMMENDED PROTECTION DEVICES - OUTPUT					
Rated power (kVA)	300	400	500	600	800
Inverter Short-circuit Current limitation <sup>(2)</sup>	200% of the rated current				
Circuit breaker (A)	≤ 80	≤ 100	≤ 125	≤ 160	≤ 200

CABLES CONNECTION - MAXIMUM CAPABILITY PER POLE					
Rated power (kVA)	300	400	500	600	800
Rectifier terminals (mm <sup>2</sup> )	185 x 2	240 x 2	185 x 3	240 x 3	240 x 4
Bypass terminals (mm <sup>2</sup> )	150 x 2	185 x 2	240 x 2	185 x 3	240 x 3
Battery terminals (mm <sup>2</sup> )	240 x 2	240 x 2	240 x 3	240 x 4	240 x 5
Output terminals (mm <sup>2</sup> )	150 x 2	185 x 2	240 x 2	185 x 3	240 x 3

(1) Rectifier protection should only be considered in case 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) 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. Ik1: phase to neutral, Ik2: phase to phase, Ik3: three-phase to neutral.

 600 kVA bottom version with common inputs: the input must be shared between  $V_{in}$  and Bps due to copper bar link for common inputs.

 800 kVA switches version with common inputs: the input must ONLY be connected on  $V_{in}$  due to copper bar link for common inputs.

## 5. REFERENCE STANDARDS AND DIRECTIVES

### 5.1. OVERVIEW

---

The equipment, installed, used and serviced in accordance with its intended use, its regulations and standards, its manufacturer instructions and rules, is in compliance with the relevant Union harmonization legislation:

#### **LVD 2014 / 35 / EU**

DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014, on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

#### **EMC 2014 / 30 / EU**

DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014, on the harmonization of the laws of the Member States relating to electromagnetic compatibility.

#### **RoHS 2011/65/EU**

Directive 2011/65 of the European parliament and of the council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

### 5.2. STANDARDS

---

#### **SAFETY**

EN 62040-1 Uninterruptible Power System (UPS) - Part 1: General and safety requirements

IEC 62040-1 Uninterruptible Power System (UPS) - Part 1: Safety requirements.

#### **ELECTROMAGNETIC COMPATIBILITY**

EN 62040-2 Uninterruptible Power System (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements

IEC 62040-2 Uninterruptible Power System (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements.

#### **ENVIRONMENTAL**

IEC 62040-4 Uninterruptible Power System (UPS) - Part 4: Environmental aspects - Requirements and reporting.

### 5.3. SYSTEM AND INSTALLATION GUIDELINES

---

When carrying out electrical installation, all the above standards must be observed. All national and international standards ( e.g IEC60364 ) applicable to the specific electrical installation including batteries must be observed.

For further information refer to 'Technical specifications' chapter in the user manual.

