

MASTERYS BC

15 to 120 kVA



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

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

Models								
Rated power (kVA)	15	20	30	40	60	80	100	120
MASTERYS BC 3/1	•	•	-	-	-	-	-	-
MASTERYS BC 3/3	•	•	•	•	•	•	•	•

Matrix table for model and kVA power rating

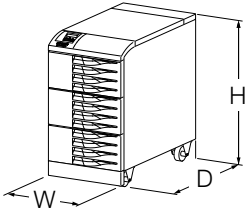
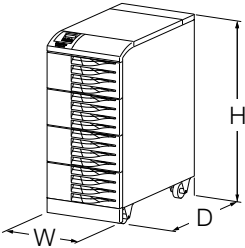
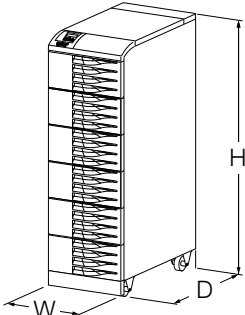
Each family has been specifically designed to meet the demands of loads in specific application contexts, in order to optimise the features of the product and to facilitate its integration within the system.

2. FLEXIBILITY

2.1. Power ratings

2.1.1. MASTERYS BC 15 to 80 kVA

The entire range is compatible with 3 cabinets, all with the same footprint. The UPS's power and autonomy thus translates into the height of the cabinet itself (800 mm, 1000 mm, 1400 mm).

Dimensions			
Cabinet type	Width (W) [mm]	Depth (D) [mm]	Height (H) [mm]
 S (short)	444	795	800
 M (medium)	444	795	1000
 T (tall)	444	795	1400

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 in the upper front part and can be accessed from the first panel with the red surround.

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

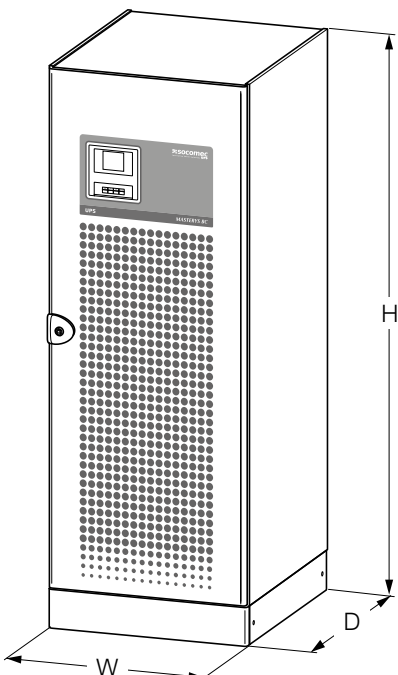
2.1.2. MASTERYS BC 100 to 120 kVA

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.

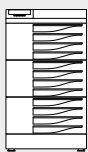
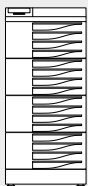
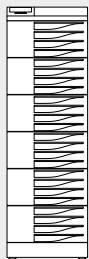
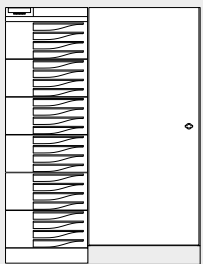
The air inlet is on the front, with outflow from the upper side; this means other equipment or external battery enclosures can be placed alongside the UPS unit.

Dimensions			
	Width (W) [mm]	Depth (D) [mm]	Height (H) [mm]
	700	800	1930

2.2. Flexible back-up time

Different extended back-up times are possible by using the standard UPS cabinet or the larger sized cabinet, both of which occupy minimum floor space.

For powers greater than or equal to 40 kVA, or long back-up power periods, an additional cabinet should be used, optionally with a supplementary battery charger.

BACK-UP times in minutes (max @ 70% of load)				
	 S	 M	 T	 T with supplementary battery cabinet ^(*)
MASTERYS BC 15 kVA	9	25	42	•
MASTERYS BC 20 kVA	5	16	29	•
MASTERYS BC 30 kVA	-	9	25	•
MASTERYS BC 40 kVA	-	5	16	•

* Supplementary battery cabinet (WxDxH): 600 x 835 x 1400 mm

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 back-up times.

The UPS system's internal batteries consist of distinct strings of battery packs connected in series; each individual pack is connected using polarised connectors to facilitate battery configuration and maintenance.

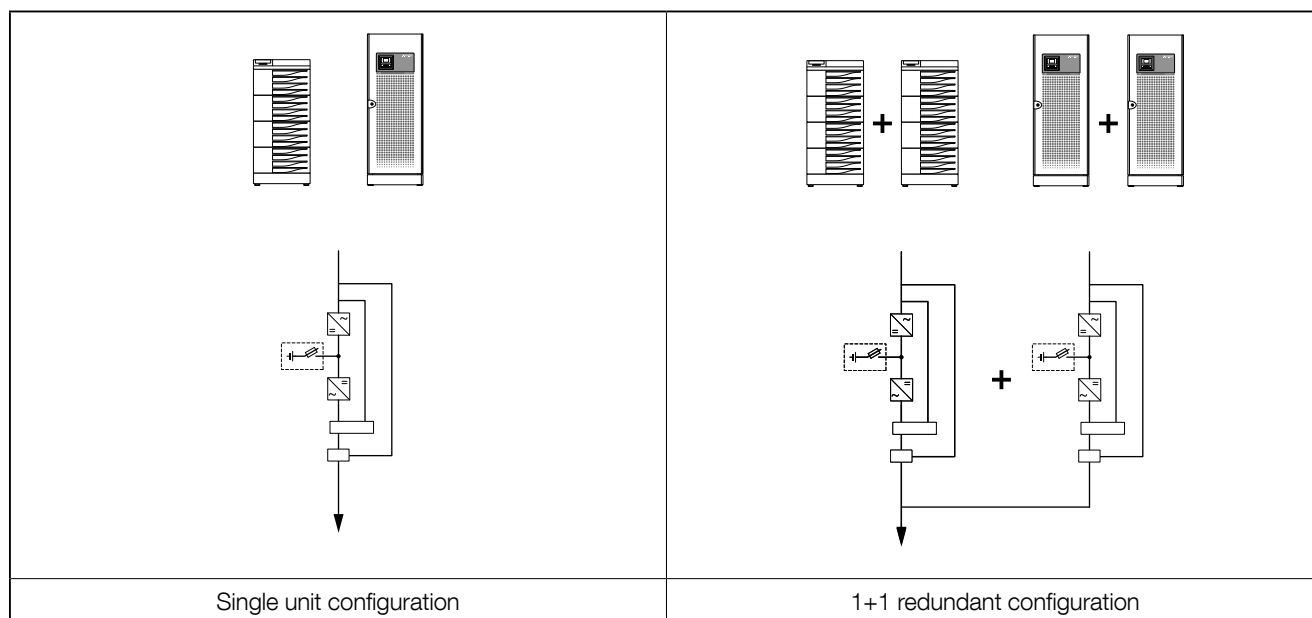
Each pack is sealed in an acid-proof container which is designed to prevent damage in the case of acid leakage.

To guarantee maximum back-up time availability and battery life, MASTERYS BC 10-120 kVA is equipped with EBS (Expert Battery System).

2.3. Horizontal and vertical parallel

MASTERYS 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.



2.4. Availability, redundancy and efficiency

To increase the availability of the power supply, redundant parallel configurations are becoming increasingly common. Consequently, the overall efficiency of the UPS system risks being reduced due to the low load on each individual machine.

3. STANDARD AND OPTIONS

3.1. Standard electrical features

- Dual input mains (BC 15 to 40, BC 100-120).
- Internal manual bypass.
- Backfeed protection: detection circuit.
- EBS (Expert Battery System) for battery management.

3.2. Electrical options.

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

3.3. Standard communication features.

- MODBUS RTU.
- 2 slots for communication options.

3.4. Communication options.

- Dry-contact interface.
- MODBUS TCP.
- 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 parameters											
Rated power (kVA)		15	20	15	20	30	40	60	80	100	120
Phase in/out		3/1		3/3							
Active power (kW)		13.5	18	13.5	18	27	36	54	72	90	108
Rated/maximum rectifier input current (EN 62040-3) (A)		21/29	28/37	21/29	28/37	42/53	56/70	83/101	111/132	139/177	166/210
Rated bypass input current (A)		65	87	22	29	44	58	88	116	145	174
Inverter output current @ 230 V (A)		65	87	22	29	44	58	88	116	145	174
Maximum air flow (m³/h)		280				465		1330		2000	
Sound level (dBA)		< 52				< 55		< 62		< 65	
Dissipation at rated load (minimum mains power present and batteries charged)	(W)	883	1211	876	1185	1706	2142	5341	7121	5299	7136
	(kcal/h)	760	1042	754	1019	1467	1826	4592	6123	4556	6136
	(BTU/h)	3016	4135	2992	4045	5823	7250	18234	24312	18091	24362
Dimensions (with standard back-up time)	W (mm)	444								700	
	D (mm)	795								800	
	H (mm)	800/1000/1400						1400		1930	
Weight, without batteries (kg)		105	110	105	110	135	152	180	200	410	430
Weight, with batteries (kg)		195	240	195	240	315	415	-	-	-	-

4.2. Electrical characteristics

Electrical characteristics - Input										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
Rated mains supply voltage	400 V 3ph + N									
Voltage tolerance	3Ph+N 400 V -15% +20% (up to -40% @50% of nominal load)									
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	< I _n (no overcurrent)									

Electrical characteristics - Bypass										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
Bypass frequency variation speed	1 Hz/s (settable up to 3 Hz/s)									
Bypass rated voltage	Nominal output voltage ±15%									
Bypass rated frequency (selectable)	50/60 Hz									
Bypass frequency tolerance	±2% (configurable from 1% to 8%)									

Electrical characteristics - Inverter											
Rated power (kVA)		15	20	15	20	30	40	60	80	100	120
Phase in/out		3/1		3/3							
Rated output voltage (selectable)		220/230/240 V		380/400/415 V							
Output voltage tolerance		Static: ±1% Dynamic: VF-SS-111 (EN62040-3) compliant									
Rated output frequency		50/60 Hz (selectable)									
Output frequency tolerance		±0.01% (on mains power failure)									
Load crest factor		≥ 2.7:1									
Voltage harmonic distortion		< 1% with linear load									
Overload tolerated by the inverter	10 min	16.8 kW	22.5 kW	16.8 kW	22.5 kW	33.7 kW	45 kW	67.5 kW	90 kW	112.5 kW	135 kW
	1 min	20.2 kW	27 kW	20.2 kW	27 kW	40.5 kW	54 kW	81 kW	108 kW	135 kW	162 kW

Electrical characteristics - Efficiency										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
Double conversion efficiency (normal mode) - full load	up to 94.5%									
Efficiency in Eco-Mode	98%									

Electrical characteristics - Environment										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
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 (IP21 optional)								IP20	
Portability	ASTM D999-08, ASTM D-880, AFNOR NF H 00-042									
Colour	RAL 7012								RAL 7012, silver grey frontal door	

(1) Conditions apply.

4.3. Recommended protections

RECOMMENDED PROTECTION DEVICES - Rectifier ⁽¹⁾										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
D curve circuit breaker (A)	32	40	32	40	63	80	125	160	250	250
gG fuse (A)	32	40	32	40	63	80	125	160	250	250

RECOMMENDED PROTECTION DEVICES - General bypass ⁽¹⁾										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
Maximum I ² t supported by the bypass (A ² s)	80000		8000		15000		80000	125000	320000	
Icc max (A)	4000		1200		1700		4000	5000	8000	8000
D curve circuit breaker (A)	100	125	32	40	63	80	125	160	250	250
gG fuse (A)	100	125	32	40	63	80	125	160	250	250

RECOMMENDED PROTECTION DEVICES - Input residual current circuit breaker ⁽²⁾										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
Input residual current circuit breaker	> 0.5 A Selective									

RECOMMENDED PROTECTION DEVICES - Output ⁽³⁾										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
Short-circuit inverter current (A) (when AUX MAINS is not present)	0 to 40 ms	165	216	56	74	117	156	206	270	470
	40 to 100 ms	140	183	48	62	95	126	206	270	420
C curve circuit breaker ⁽³⁾ (A)	≤ 16	≤ 20	≤ 4	≤ 6	≤ 10	≤ 13	≤ 16	≤ 20	≤ 40	
B curve circuit breaker ⁽³⁾ (A)	≤ 32	≤ 40	≤ 8	≤ 12	≤ 20	≤ 25	≤ 25	≤ 32	≤ 80	
High-speed fuse ⁽³⁾ (A)	≤ 18	≤ 24	≤ 6	≤ 10	≤ 12	≤ 16	≤ 25	≤ 32	≤ 80	

CABLES - Maximum cable section										
Rated power (kVA)	15	20	15	20	30	40	60	80	100	120
Phase in/out	3/1		3/3							
Rectifier terminals	4xCBD25 (35 mm²)		4xCBD16 (25 mm²)		4xCBD25 (35 mm²)		4xCBD35 (50 mm²)		150 mm²	
Bypass terminals	2xCBD25 (35 mm²)									
Battery terminals	4xCBD25 (35 mm²)						4xCBD70 (95 mm²)			
Output terminals	2xCBD25 (35 mm²)						4xCBD35 (50 mm²)			

(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 (Class A)

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 (certified by TÜV SÜD)

EN 50272-2 Safety requirements for secondary batteries and battery installations

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

Once installed in a system, the UPS will not alter the neutral conditions; this is because the neutral input terminal “N” is connected directly to output terminal “N1” inside the equipment. If the neutral condition of the system downstream of the UPS needs to be modified, it will be necessary to use the isolation transformer option.

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