



# ULTIMATE

Fault tolerant power  
without compromise

# MODULYS XS

From 2.5 to 20 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 distribution panel which can isolate the network upstream of the UPS must be installed. This electrical distribution panel must be equipped with a protection device (or two, if there is a separate bypass line) of an appropriate rating for the power drawn at full load.

For detailed information, see the installation and operating manual.

# 1. ARCHITECTURE

## 1.1 RANGE

MODULYS XS is a full range of high performing UPS system designed to:

- ensure 24/7/365 availability and business continuity for mission critical applications
- avoid data losses and downtime of company operations,
- reduce the electrical infrastructure's total cost of ownership,
- adopt a sustainable development approach.

MODULYS XS								
Module power	2.5 (kVA/kW)				5.0 (kVA/kW)			
Phase in / phase out	1/1				1/1 and 3/1			
Number of power modules	1	2	3	4	1	2	3	4
System Rated power (kVA/kW)	2.5	5	7.5	10	5	10	15	20
<b>MC6</b>	•	•	•	•	•	•	•	•
<b>MC9</b>	•	•	•	•	•	•	•	•
<b>RM3</b>	•	•	•		•	•	•	
<b>RM4</b>	•	•	•	•	•	•	•	•
<b>TC3</b>	•	•	•		•	•	•	

Matrix table for model and kVA power rating

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

## 2. FLEXIBILITY

### 2.1 POWER RATINGS FROM 2.5 TO 20 kVA/kW

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 detailed design also provides easy access for maintenance and installation.

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

MODULYS XS MC					
	Dimensions	Width [mm]	Depth [mm]	Height [mm]	weight (kg)
MC6		550	635	1060	90
MC9		550	635	1460	120
MODULYS XS RM					
RM3		449 (19")	570	575	44
RM4		449 (19")	570	708	50

	Dimensions	Width [mm]	Depth [mm]	Height [mm]	weight (kg)
<b>MODULYS XS TC3</b>					
TC3		600	600	1400	140

**ADDITIONAL MODULE**

<b>MODULYS XS Power Module</b>					
2.5 kW Power Module		446	475	131	14
5 kW Module		446	475	131	18
<b>MODULYS XS Battery Module</b>					
Battery Module		446	475	131	10
Battery Pack long life		100	330	115	9
Battery Pack normal life		100	330	115	9
Battery for TC3 100 Ah		Mounted inside the TC3 cabinet			145

## 2.2 FLEXIBLE BACK-UP TIME

Different extended back-up times are possible by using battery modules with a enhanced battery charger. Selection of the back-up time is flexible thanks to the wide range of battery packs.

### 2.2.1 MODULYS XS (MC systems)

Back up time in minutes @ typical load

System power (kVA/kW)		2.5	5	7.5	10		5	10	15	20		
Module Rated power		2.5 (kVA/kW)					5 (kVA/kW)					
Battery pack number	2	8	Consult us			MC-6/MC-9						
	3	14	Consult us									
	4	21	8	Consult us			8					
	5	27	11	Consult us			12					
	6	35	14	8	Consult us		14					
	7	42	17	10	Consult us		17					
	8	49	21	12	8		Consult us		21	8		
	9	57	24	14	10		Consult us		24	10		
	10	65	27	16	11		Consult us		28	12		
	11	73	31	18	13		Consult us		31	13		
	12	81	35	21	14		Consult us		35	14	8	
	13	90	38	23	16		Consult us		38	16	9	
	14	98	42	25	17		Consult us		42	17	10	
	15	105	46	27	19		Consult us		46	19	12	
	16	114	49	30	21		Consult us		49	21	12	8
	17	123	52	32	23		Consult us		53	23	13	9
	18	132	57	35	24		Consult us		57	24	14	10
	19	140	61	37	25	Consult us		61	26	16	11	
	20	148	65	39	27	Consult us		66	28	17	12	
	21	157	69	42	29	Consult us		69	29	17		
	22	167	73	44	31	Consult us		73	31	19		
	23	176	76	47	33	Consult us		77	33	20		
	24	185	81	49	35	Consult us		81	35	21		
	25	194	86	51	36	Consult us		86	36			
	26	202	90	54	38	Consult us		90	38			
	27	209	94	57	40	Consult us		94	40			
	28	220	98	60	42	Consult us		98	42			
	29	229	101	63		Consult us		102				
	30	238	105	65		Consult us		105				
	31	248	109			Consult us		109				
	32	256	114			Consult us		114				
	33	264				Consult us						
	34	272				Consult us						
						Consult us						

Typical load = 70% Pn

### 2.2.2 MODULYS XS (RM systems)

Back up time in minutes @ typical load

System power (kVA/kW)		2.5	5	7.5	10		5	10	15	20	
Module Rated power		<b>2.5 (kVA/kW)</b>					<b>5 (kVA/kW)</b>				
Battery pack number	2	8	Consult us			<b>RM-3/RM-4</b>	Consult us				
	3	14									
	4	21									8
	5	27									11
	6	35									14
	7	42	17	10							
	8	49	21	12	8						
	9	57	24	14	<b>RM-4</b>		21	8	Consult us		
	10	65	27	16							
	11	73	31	Consult us			24				
	12	81	35				28				
	13	90					31				
	14	98			35						

Typical load = 70% Pn

### 2.2.3 MODULYS XS (TC System)

Back up time in minutes @ typical load

System power		2.5	5	7.5		5	10	15
Module Rated power (kVA/kW)		<b>2.5 (kVA/kW)</b>				<b>5 (kVA/kW)</b>		
Battery Capacity	100 Ah	118	50	28		50	19	10
	200 Ah	271	118	72		118	50	28

Typical load = 70% Pn

### 3. STANDARD FEATURES AND OPTIONS

Availability	
○	Available as option (installation on site)
STD	Standard feature

	MC	RM	TC	Notes
<b>Communication Option</b>				
ADC+SL card <i>(Advanced Dry Contact + Serial Link)</i>	○	○	○	
External temperature sensor	○	○	○	  ADC+SL card
Remote touchscreen display	○	○	○	  ADC+SL card
BACnet/IP interface card	○	○	○	
Modbus TCP interface card	○	○	○	
Net Vision card <i>(professional WEB/SNMP interface for UPS monitoring)</i>	○	○	○	
EMD <i>(Environmental Monitoring Device: temperature, humidity, 2 dry contacts)</i>	○	○	○	  Net Vision card
<b>Electrical Option</b>				
Dual Input	STD	STD	STD	
Tropicalization	STD	STD	STD	
External maintenance bypass	○	○	○	

 Required option

## 4. SPECIFICATIONS MC6 / MC9

### 4.1 INSTALLATION PARAMETERS

Installation parameters									
System Rated power (kVA/kW)		2.5	5	7.5	10	5	10	15	20
Module Rated power (kVA/kW)		2.5				5			
Number of Modules		1	2	3	4	1	2	3	4
Phase in/out		1/1				1/1 or 3/1			
Active power	kW	2.5	5	7.5	10	5	10	15	20
Rated/maximum rectifier input current (EN 62040-3)	A	12/15	24/30	36/44	47/59	24/30	47/59	71/87	95/118
Rated bypass input current <sup>(1)</sup>	A	11	22	33	44	22	44	65	87
Inverter output current @ 230 V Pn	A	11	22	33	44	22	44	65	87
Recommended air flow capacity	m <sup>3</sup> /h	160	320	480	640	240	480	720	960
Acoustic noise @ 70% Pn	dBA	43	46	49	52	45	48	51	54
Power dissipation in nominal conditions <sup>(2)</sup>	W	220	440	660	880	420	840	1260	1680
	kcal/h	189	378	567	757	361	722	1083	1445
	BTU/h	751	1501	2252	3003	1433	2866	4299	5732
Power dissipation (max) in the worst conditions <sup>(3)</sup>	W	250	500	750	1000	480	960	1440	1920
	kcal/h	215	430	645	860	413	825	1238	1651
	BTU/h	853	1706	2559	3412	1638	3276	4913	6551
Dimensions MC6/MC9	Width	mm 550							
	Depth	mm 635							
	Height	mm 1060 / 1460							
Single unit Clearances	Operational	mm Rear 300 lateral 0							
	Maintenance	mm Front 1000 top 800							
Weight MC6/MC9	kg	90 / 120							

1. Considering nominal bypass current calculated @ 230 V, considering a continuous overload of 110%.
2. Considering nominal input current (230 V, battery charged) and rated output active power.
3. Considering maximum input current (low input voltage, battery charged) and rated output active power.

### 4.2 ELECTRICAL CHARACTERISTICS

Electrical characteristics - Rectifier Input									
System Rated power (kVA/kW)		2.5	5	7.5	10	5	10	15	20
Module Rated power (kVA/kW)		2.5				5			
Number of Modules		1	2	3	4	1	2	3	4
Rated mains supply voltage	V	230 1ph + N				230 1ph + N 400 3ph + N			
Voltage tolerance	V	184 to 276 (±20%)				184 to 276 (±20%) 320 to 480 (±20%)			
Voltage tolerance at derated load	V	up to 150 @ 70% of nominal load				up to 150 1ph + N up to 260 3ph + N @ 70% of nominal load			
Rated frequency	Hz	50/60							
Frequency tolerance		±10%							
Current Total harmonic distortion (THDi)		≤ 6%				≤ 5.4%			
Power factor (at full load and rated voltage)		≥ 0.98							
Max inrush current at start-up		<In							

System Rated power (kVA/kW)	<b>2.5</b>	<b>5</b>	<b>7.5</b>	<b>10</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>
Module Rated power (kVA/kW)	2.5				5			
Number of Modules	1	2	3	4	1	2	3	4

Electrical characteristics - Bypass									
Bypass frequency variation speed	Hz/s	1 Hz/s							
Bypass rated voltage		Nominal output voltage $\pm 15\%$							
Bypass rated frequency	Hz	50/60 Hz (selectable)							
Bypass frequency tolerance		$\pm 2\%$ ( $\pm 8\%$ with genset)							
Bypass current overload (A)	5 min	13	25	38	51	25	51	77	100
	1 min	15	30	44	59	30	59	88	117
	20 sec	19	39	59	79	39	79	117	156

Electrical characteristics - Inverter									
Rated output voltage	V	208 <sup>(1)</sup> /220/230/240 (selectable)							
Output voltage tolerance		Static: $\pm 3\%$ VFI-SS (EN 62040-3 compliant)							
Rated output frequency	Hz	50/60 Hz (selectable)							
Output frequency tolerance		$\pm 0.1\%$ on mains power failure							
Load crest factor		$\geq 2.3$							
Voltage total harmonic distortion THDV		$< 3.5\%$ with linear load							
Inverter overload (kW) in normal mode	5 min	2.75	5.5	8.25	11	5.5	11	16.5	22
	10 sec	3.25	6.5	9.75	13	6.5	13	19.5	26
Short-circuit inverter current (A) (when AUX MAINS is not present)	0 to 60 ms	25	50	75	100	50	100	150	200

Electrical characteristics - Efficiency									
Double conversion efficiency		up to 92.8%							
EcoMode efficiency		99%							

Electrical characteristics - Environment									
Storage temperatures	°C	-5 to +50 (15 to 25 for better battery life)							
Working temperature	°C	0 to +40 (15 to 25 for better battery life)							
Maximum relative humidity (non-condensing)		95%							
Maximum altitude without derating	m (ft)	1000 (3300)							
Degree of protection		IP20							
Colour		RAL 7016							

Electrical characteristics - Battery									
Standard max. recharge current	A	2.4 per Battery Module							

1. Up to 90% P<sub>n</sub>

## 4.3 RECOMMENDED PROTECTIONS

System Rated power (kVA/kW)	2.5	5	7.5	10	5	10	15	20
Module Rated power (kVA/kW)	2.5				5			
Number of Modules	1	2	3	4	1	2	3	4

RECOMMENDED PROTECTION DEVICES - Rectifier <sup>(1)</sup>									
C curve circuit breaker (1ph/3ph)	A	16	32	50	63	32/13	63/26	100/32	125/50
gG fuse (1ph/3ph)	A	16	32	50	63	32/12	63/25	100/32	125/50

RECOMMENDED PROTECTION DEVICES - General bypass <sup>(2)</sup>									
Conditional short circuit current rating (Icc)	kA	10				10			
C curve circuit breaker	A	16	32	40	63	32	63	100	125
gG fuse	A	16	32	40	63	32	63	100	125

RECOMMENDED PROTECTION DEVICES - Input residual current circuit (RCD) breaker <sup>(3)</sup>									
Input residual current circuit breaker	A	0.1 A Selective type B							

RECOMMENDED PROTECTION DEVICES - Output <sup>(4)</sup>									
C curve circuit breaker <sup>(3)</sup>	A	2	4	6	8	4	8	13	16
B curve circuit breaker <sup>(3)</sup>	A	4	8	12	16	8	16	25	32

CABLES - Maximum cable section <sup>(5)</sup>									
Rectifier terminals	mm	50							
Bypass terminals	mm	50							
Battery terminals <sup>(5)</sup>	mm	2x 95							
Output terminals	mm	50							

1. Rectifier protection should only be considered in the event of separate inputs. Recommended values to avoid unwanted tripping with UPS at full power. When the bypass and rectifier inputs are combined (common input), the general input protection rating must be the highest of the two (bypass or rectifier).
2. Recommended values to avoid unwanted tripping with UPS at full power. When the bypass and rectifier inputs are combined (common input), the general input protection rating must be the highest of the two (bypass or rectifier).
3. RCD is not necessary when the UPS is installed in a TN-S system. RCD is not permitted on TN-C systems. If an RCD is required a B-type should be used. Must be coordinate with residual current circuit breakers downstream of the UPS connected to the UPS output.
4. Protection tripping downstream of the UPS with inverter short circuit current (Worst case = AUX MAINS not present). In the Normal case, with AUX MAINS present, fault clearing is determined by the Mains short-circuit capability.
5. Use cable with tin-plated eyelets for the connection

## 5. SPECIFICATIONS RM3 / RM4

### 5.1 INSTALLATION PARAMETERS

Installation parameters									
RM3 System Rated power (kVA/kW)		2.5	5	7.5		5	10	15	
RM4 System Rated power (kVA/kW)		2.5	5	7.5	10	5	10	15	20
Module Rated power (kVA/kW)		2.5				5			
Number of Modules		1	2	3	4	1	2	3	4
Phase in/out		1/1				1/1 or 3/1			
Active power	kW	2.5	5	7.5	10	5	10	15	20
Rated/maximum rectifier input current (EN 62040-3)	A	12/15	24/30	36/44	47/59	24/30	47/59	71/87	95/118
Rated bypass input current <sup>(1)</sup>	A	11	22	33	44	22	44	65	87
Inverter output current @ 230 V Pn	A	11	22	33	44	22	44	65	87
Recommended air flow capacity	m <sup>3</sup> /h	160	320	480	640	240	480	720	960
Acoustic noise @ 70% Pn	dBA	43	46	49	52	45	48	51	54
Power dissipation in nominal conditions <sup>(2)</sup>	W	220	440	660	880	420	840	1260	1680
	kcal/h	189	378	567	757	361	722	1083	1445
	BTU/h	751	1501	2252	3003	1433	2866	4299	5732
Power dissipation (max) in the worst conditions <sup>(3)</sup>	W	250	500	750	1000	480	960	1440	1920
	kcal/h	215	430	645	860	413	825	1238	1651
	BTU/h	853	1706	2559	3412	1638	3276	4913	6551
Dimensions RM3/RM4	Width	mm	449						
	Depth	mm	570						
	Height	mm	575 / 708						
Weight	kg	44 / 50							

1. Considering nominal bypass current calculated @ 230 V, considering a continuous overload of 110%.
2. Considering nominal input current (230 V, battery charged) and rated output active power.
3. Considering maximum input current (low input voltage, battery charged) and rated output active power.

### 5.2 ELECTRICAL CHARACTERISTICS

Electrical characteristics - Rectifier Input									
RM3 System Rated power (kVA/kW)		2.5	5	7.5		5	10	15	
RM4 System Rated power (kVA/kW)		2.5	5	7.5	10	5	10	15	20
Module Rated power (kVA/kW)		2.5				5			
Number of Modules		1	2	3	4	1	2	3	4
Rated mains supply voltage	V	230 1ph + N				230 1ph + N 400 3ph + N			
Voltage tolerance	V	184 to 276 (±20%)				184 to 276 (±20%) 320 to 480 (±20%)			
Voltage tolerance at derated load	V	up to 150 @ 70% of nominal load				up to 150 1ph + N up to 260 3ph + N @ 70% of nominal load			
Rated frequency	Hz	50/60							
Frequency tolerance		±10%							
Current Total harmonic distortion (THDi)		≤ 6%				≤ 5.4%			
Power factor (at full load and rated voltage)		≥ 0.98							
Max inrush current at start-up		<In							

<b>RM3</b> System Rated power (kVA/kW)	<b>2.5</b>	<b>5</b>	<b>7.5</b>		<b>5</b>	<b>10</b>	<b>15</b>	
<b>RM4</b> System Rated power (kVA/kW)	<b>2.5</b>	<b>5</b>	<b>7.5</b>	<b>10</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>
Module Rated power (kVA/kW)	2.5				5			
Number of Modules	1	2	3	4	1	2	3	4

Electrical characteristics - Bypass									
Bypass frequency variation speed	Hz/s	1 Hz/s							
Bypass rated voltage		Nominal output voltage $\pm 15\%$							
Bypass rated frequency	Hz	50/60 Hz (selectable)							
Bypass frequency tolerance		$\pm 2\%$ ( $\pm 8\%$ with genset)							
Bypass current overload (A)	5 min	13	25	38	51	25	51	77	100
	1 min	15	30	44	59	30	59	88	117
	20 sec	19	39	59	79	39	79	117	156

Electrical characteristics - Inverter									
Rated output voltage	V	208 <sup>(1)</sup> /220/230/240 (selectable)							
Output voltage tolerance		Static: $\pm 3\%$ VFI-SS (EN 62040-3 compliant)							
Rated output frequency	Hz	50/60 Hz (selectable)							
Output frequency tolerance		$\pm 0.1\%$ on mains power failure							
Load crest factor		$\geq 2.3$							
Voltage total harmonic distortion THDV		$< 3.5\%$ with linear load							
Inverter overload (kW)	5 min	2.75	5.5	8.25	11	5.5	11	16.5	22
	10 sec	3.25	6.5	9.75	13	6.5	13	19.5	26
Short-circuit inverter current (A) (when AUX MAINS is not present)	0 to 60 ms	25	50	75	100	50	100	150	200

Electrical characteristics - Efficiency									
Double conversion efficiency		up to 92.8%							
EcoMode efficiency		99%							

Electrical characteristics - Environment									
Storage temperatures	°C	-5 to +50 (15 to 25 for better battery life)							
Working temperature	°C	0 to +40 (15 to 25 for better battery life)							
Maximum relative humidity (non-condensing)		95%							
Maximum altitude without derating	m (ft)	1000 (3300)							
Degree of protection		IP20							
Colour		RAL 7016							

Electrical characteristics - Battery									
Standard max. recharge current	A	2.4 per Battery Module							

1. Up to 90% P<sub>n</sub>

## 5.3 RECOMMENDED PROTECTIONS

<b>RM3</b> System Rated power (kVA/kW)	<b>2.5</b>	<b>5</b>	<b>7.5</b>		<b>5</b>	<b>10</b>	<b>15</b>	
<b>RM4</b> System Rated power (kVA/kW)	<b>2.5</b>	<b>5</b>	<b>7.5</b>	<b>10</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>
Module Rated power (kVA/kW)	2.5				5			
Number of Modules	1	2	3	4	1	2	3	4

RECOMMENDED PROTECTION DEVICES - Rectifier <sup>(1)</sup>									
C curve circuit breaker (1ph/3ph)	A	16	32	50	63	32/13	63/26	100/32	125/50
gG fuse (1ph/3ph)	A	16	32	50	63	32/12	63/25	100/32	125/50

RECOMMENDED PROTECTION DEVICES - General bypass <sup>(2)</sup>									
Conditional short circuit current rating (I <sub>cc</sub> )	kA	10				10			
C curve circuit breaker	A	16	32	40	63	32	63	100	125
gG fuse	A	16	32	40	63	32	63	100	125

RECOMMENDED PROTECTION DEVICES - Input residual current circuit (RCD) breaker <sup>(3)</sup>		
Input residual current circuit breaker	A	0.1 A Selective type B

RECOMMENDED PROTECTION DEVICES - Output <sup>(4)</sup>									
C curve circuit breaker <sup>(3)</sup>	A	2	4	6	8	4	8	13	16
B curve circuit breaker <sup>(3)</sup>	A	4	8	12	16	8	16	25	32

CABLES - Maximum cable section <sup>(5)</sup>		
Rectifier terminals	mm	50
Bypass terminals	mm	50
Battery terminals <sup>(5)</sup>	mm	2x 95
Output terminals	mm	50

1. Rectifier protection should only be considered in the event of separate inputs. Recommended values to avoid unwanted tripping with UPS at full power. When the bypass and rectifier inputs are combined (common input), the general input protection rating must be the highest of the two (bypass or rectifier).
2. Recommended values to avoid unwanted tripping with UPS at full power. When the bypass and rectifier inputs are combined (common input), the general input protection rating must be the highest of the two (bypass or rectifier).
3. RCD is not necessary when the UPS is installed in a TN-S system. RCD is not permitted on TN-C systems. If an RCD is required a B-type should be used. Must be coordinate with residual current circuit breakers downstream of the UPS connected to the UPS output.
4. Protection tripping downstream of the UPS with inverter short circuit current (Worst case = AUX MAINS not present). In the Normal case, with AUX MAINS present, fault clearing is determined by the Mains short-circuit capability.
5. Use cable with tin-plated eyelets for the connection

## 6. SPECIFICATIONS TC3

### 6.1 INSTALLATION PARAMETERS

Installation parameters							
System Rated power (kVA/kW)		<b>2.5</b>	<b>5</b>	<b>7.5</b>	<b>5</b>	<b>10</b>	<b>15</b>
Module Rated power (kVA/kW)		2.5			5		
Number of Modules		1	2	3	1	2	3
Phase in/out		1/1			1/1 or 3/1		
Active power	kW	2.5	5	7.5	5	10	15
Rated/maximum rectifier input current (EN 62040-3)	A	12/15	24/30	36/44	24/30	47/59	71/87
Rated bypass input current <sup>(1)</sup>	A	11	22	33	22	44	65
Inverter output current @ 230 V Pn	A	11	22	33	22	44	65
Recommended air flow capacity	m <sup>3</sup> /h	160	320	480	240	480	720
Acoustic noise @ 70% Pn	dB(A)	43	46	49	45	48	51
Power dissipation in nominal conditions <sup>(2)</sup>	W	220	440	660	420	840	1260
	kcal/h	189	378	567	361	722	1083
	BTU/h	751	1501	2252	1433	2866	4299
Power dissipation (max) in the worst conditions <sup>(3)</sup>	W	250	500	750	480	960	1440
	kcal/h	215	430	645	413	825	1238
	BTU/h	853	1706	2559	1638	3276	4913
Dimensions	Width	mm	600				
	Depth	mm	600				
	Height	mm	1400				
Single unit Clearances	Operational	mm	Rear 300 lateral 0				
	Maintenance	mm	Front 1000 top 800				
Weight	kg	140					

1. Considering nominal bypass current calculated @ 230 V, considering a continuous overload of 110%.
2. Considering nominal input current (230 V, battery charged) and rated output active power.
3. Considering maximum input current (low input voltage, battery charged) and rated output active power.

### 6.2 ELECTRICAL CHARACTERISTICS

Electrical characteristics - Rectifier Input							
System Rated power (kVA/kW)		<b>2.5</b>	<b>5</b>	<b>7.5</b>	<b>5</b>	<b>10</b>	<b>15</b>
Module Rated power (kVA/kW)		2.5			5		
Number of Modules		1	2	3	1	2	3
Rated mains supply voltage	V	230 V 1ph + N			230 1ph + N 400 3ph + N		
Voltage tolerance	V	184 to 276 (±20%)			184 to 276 (±20%) 320 to 480 (±20%)		
Voltage tolerance at derated load	V	up to 150 V @ 70% of nominal load			up to 150 1ph + N up to 260 3ph + N @ 70% of nominal load		
Rated frequency	Hz	50/60					
Frequency tolerance		±10%					
Current Total harmonic distortion (THDi)		≤ 6%			≤ 5.4%		
Power factor (at full load and rated voltage)		≥ 0.98					
Max inrush current at start-up		<In					

System Rated power (kVA/kW)	<b>2.5</b>	<b>5</b>	<b>7.5</b>	<b>5</b>	<b>10</b>	<b>15</b>
Module Rated power (kVA/kW)	2.5			5		
Number of Modules	1	2	3	1	2	3

Electrical characteristics - Bypass							
Bypass frequency variation speed	Hz/s	1					
Bypass rated voltage		Nominal output voltage $\pm 15\%$					
Bypass rated frequency	Hz	50/60 (selectable)					
Bypass frequency tolerance		$\pm 2\%$ ( $\pm 8\%$ with genset)					
Bypass current overload (A)	5 min	13	25	38	25	51	77
	1 min	15	30	44	30	59	88
	20 sec	19	39	59	39	79	117

Electrical characteristics - Inverter							
Rated output voltage	V	208 <sup>(1)</sup> /220/230/240 (selectable)					
Output voltage tolerance		Static: $\pm 3\%$ VFI-SS (EN 62040-3 compliant)					
Rated output frequency	Hz	50/60 (selectable)					
Output frequency tolerance		$\pm 0.1\%$ on mains power failure					
Load crest factor		$\geq 2.3$					
Voltage total harmonic distortion THDV		$< 3.5\%$ with linear load					
Inverter overload (kW)	5 min	2.75	5.5	8.25	5.5	11	16.5
	10 sec	3.25	6.5	9.75	6.5	13	19.5
Short-circuit inverter current (A) (when AUX MAINS is not present)	0 to 60 ms	25	50	75	50	100	150

Electrical characteristics - Efficiency							
Double conversion efficiency		up to 92.8%					
EcoMode efficiency		99%					

Electrical characteristics - Environment							
Storage temperatures	°C	-5 to +50 (15 to 25 for better battery life)					
Working temperature	°C	0 to +40 (15 to 25 for better battery life)					
Maximum relative humidity (non-condensing)		95%					
Maximum altitude without derating	m (ft)	1000 (3300)					
Degree of protection		IP20					
Colour		RAL 7016					

Electrical characteristics - Battery							
Standard max. recharge current	A	2.4 per Battery Module					

1. Up to 90% P<sub>n</sub>

## 6.3 RECOMMENDED PROTECTIONS

System Rated power (kVA/kW)	<b>2.5</b>	<b>5</b>	<b>7.5</b>	<b>5</b>	<b>10</b>	<b>15</b>
Module Rated power (kVA/kW)	2.5			5		
Number of Modules	1	2	3	1	2	3

RECOMMENDED PROTECTION DEVICES - Rectifier <sup>(1)</sup>							
C curve circuit breaker (1ph/3ph)	A	16	32	50	32/13	63/26	100/32
gG fuse (1ph/3ph)	A	16	32	50	32/12	63/25	100/32

RECOMMENDED PROTECTION DEVICES - General bypass <sup>(2)</sup>							
Conditional short circuit current rating (Icc)	kA	10			10		
C curve circuit breaker	A	16	32	40	32	63	100
gG fuse	A	16	32	40	32	63	100

RECOMMENDED PROTECTION DEVICES - Input residual current circuit (RCD) breaker <sup>(3)</sup>		
Input residual current circuit breaker	A	0.1 A Selective type B

RECOMMENDED PROTECTION DEVICES - Output <sup>(4)</sup>							
C curve circuit breaker <sup>(3)</sup>	A	2	4	6	4	8	13
B curve circuit breaker <sup>(3)</sup>	A	4	8	12	8	16	25

CABLES - Maximum cable section <sup>(5)</sup>		
Rectifier terminals	mm	50
Bypass terminals	mm	50
Battery terminals <sup>(5)</sup>	mm	2x 95
Output terminals	mm	50

1. Rectifier protection should only be considered in the event of separate inputs. Recommended values to avoid unwanted tripping with UPS at full power. When the bypass and rectifier inputs are combined (common input), the general input protection rating must be the highest of the two (bypass or rectifier).
2. Recommended values to avoid unwanted tripping with UPS at full power. When the bypass and rectifier inputs are combined (common input), the general input protection rating must be the highest of the two (bypass or rectifier).
3. RCD is not necessary when the UPS is installed in a TN-S system. RCD is not permitted on TN-C systems. If an RCD is required a B-type should be used. Must be coordinate with residual current circuit breakers downstream of the UPS connected to the UPS output.
4. Protection tripping downstream of the UPS with inverter short circuit current (Worst case = AUX MAINS not present). In the Normal case, with AUX MAINS present, fault clearing is determined by the Mains short-circuit capability.
5. Use cable with tin-plated eyelets for the connection

# 7. REFERENCE STANDARDS AND DIRECTIVES

## 7.1 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 harmonisation legislation:

### LVD 2014 / 35 / EU

DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014, on the harmonisation 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 harmonisation 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

## 7.2 STANDARDS

### 7.2.1 SAFETY

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

IEC 62040-1 Uninterruptible Power System (UPS) - Part 1: Safety requirements (CB scheme by TÜV)

### 7.2.2 ELECTROMAGNETIC COMPATIBILITY

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

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

### 7.2.3 TEST AND PERFORMANCE

EN 62040-3 Uninterruptible Power System (UPS) - Part 3: Method of specifying the performance and test requirements

### 7.2.4 ENVIRONMENTAL

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

## 7.3 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.



### ELITE UPS: a mark of efficiency

Socomec, as CEMEP UPS manufacturer member, has signed a Code of Conduct put forward by the Joint Research Centre of the European Commission (JRC), to ensure the protection of critical applications and processes ensuring 24/7 continuous high quality supply. The JRC commits to mitigating energy losses and gas emissions caused by UPS equipment, therefore maximising UPS efficiency.