



ULTIMATE

Fault tolerant power
without compromise

MODULYS XM

100 to 600 + 50 kW

Redundant Modular UPS



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OBJECTIVES

The aim of these specifications is to provide the information required to prepare the system and installation site.

The specifications are intended for:

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

For detailed information, see the installation and operating manual.

1. ARCHITECTURE

1.1 RANGE AND FLEXIBILITY

Modulys XM is a modular, scalable and redundant UPS system based on plug-in and hot-swap power modules. The modularity allows power scalability by simply plugging one or more additional modules into the existing system (up to 13 modules per system).

The modularity allows also the redundancy, which is an essential feature to assure the fault tolerance of the UPS system. Redundant configuration can be set starting from N+1 up to N+R.

1.1.1 FLEXIBLE AND RATED POWER

| POWER MODULES | | | | | | | | | | | | |
|---------------------------------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Power Modules | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| N+1 redundant System Power (kW) | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 |

(1) No Power redundancy

1.1.2 FLEXIBLE SHORT-CIRCUIT PERFORMANCE

| SYSTEM CONFIGURATIONS | | |
|--------------------------|---|---|
| | Standard | High Short-circuit |
| System description | Shortcircuit safety performance according to IEC/EN62040-1 requirements | - Extra-rugged system for enhanced short-circuit safety performance (above IEC/EN 62040-1 requirements) - Ready for +1 extra Bypass Module (option) for higher Bypass short-circuit capability |
| Number of Bypass Modules | 2 | 2 + 1 ⁽¹⁾ |
| Number of Power Modules | 2 → 13 | 2 → 13 |

(1) Extra Bypass

See § 2.2.1 for detailed information on high short circuit solution.

1.1.3 FLEXIBLE CABLING

With the standard solution it is possible to meet every cabling configuration, without the need of any extra option: top cabling, bottom cabling and mixed top/bottom cabling. Decision can be taken even at last minute, on site.

With the high short-circuit solution, two different configurations (top cabling and bottom / mixed top-bottom cabling) are provided.

1.1.4 FLEXIBLE GROUNDING COMPATIBILITY

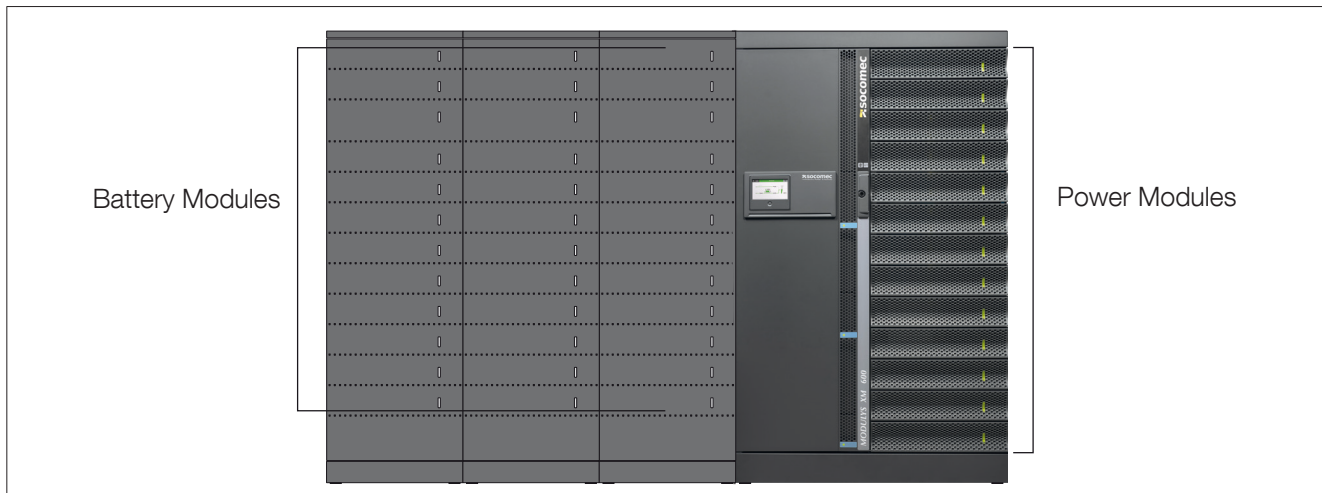
Compatible with any grounding system: TN-S, TN-C, TT, IT.

1.2 FLEXIBLE BACK-UP TIME

Different extended back-up times are possible by using: (1) a modular battery cabinet; (2) a high capacity battery cabinet. Each battery pack comprises an acid-proof container designed to prevent damage in the case of acid leakage. Each Power Module has a powerful embedded battery charger able to provide up to 20 A.

1.2.1 MODULAR HOT-SWAP BATTERY CABINET - MEDIUM CAPACITY

The modular battery system is based on vertical and horizontal modularity thanks to independent battery strings connected in parallel, each one made of hot-swap long life battery packs. Each battery string has its own independent protection and its own independent switch for fast and safe maintenance.



| DIMENSIONS AND WEIGHT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|--|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | Number of Modular hot-swap battery cabinets 9 Ah - medium capacity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | 2 | | | | | | | | | | | | 3 | | | | | | | | | | | |
| | Number of battery strings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| Height (mm) | 1990 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth (mm) | 950 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Width (mm) | 810 | | | | | | | | | | | | 1620 | | | | | | | | | | | | 2430 | | | | | | | | | | | |
| Weight (kg) | 384 | 508 | 632 | 756 | 880 | 1004 | 1128 | 1252 | 1376 | 1500 | 1624 | 1748 | 2132 | 2256 | 2380 | 2504 | 2628 | 2752 | 2876 | 3000 | 3124 | 3248 | 3372 | 3496 | 3880 | 4004 | 4128 | 4252 | 4376 | 4500 | 4624 | 4748 | 4872 | 4996 | 5120 | 5244 |

Vertical modularity using a modular battery cabinet with hot-swap battery boxes provides scalable power back-up up to 12 battery strings per cabinet.

Horizontal modularity provides very high and scalable back-up.

A standard temperature sensor optimises the battery recharging parameters according to the ambient operating temperature to extend battery life.

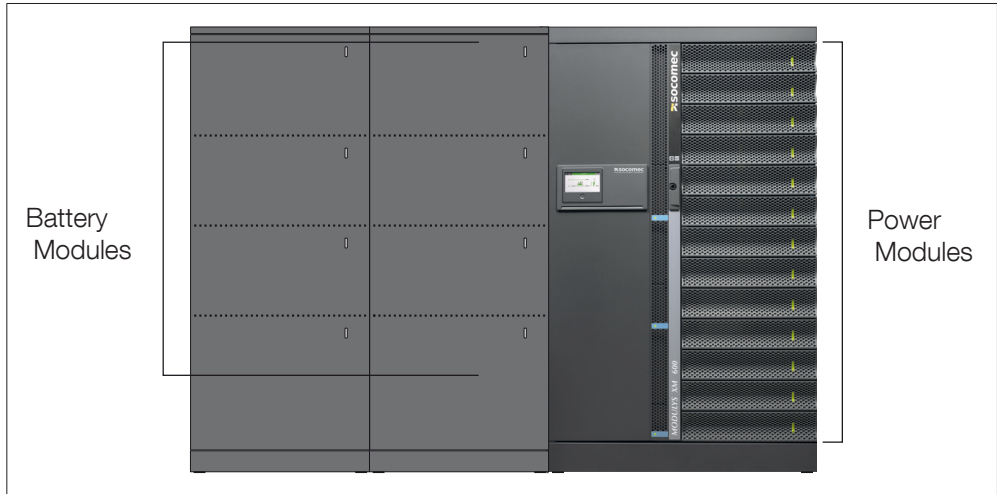
**MODULAR HOT-SWAP BATTERY CABINET
BACK UP TIMES IN MINUTES @ 75% OF RATED LOAD**

| Number of Power Modules | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | |
|---------------------------------|----|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|
| N+1 redundant System Power (kW) | | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 | | |
| Power (kW) | 1 | 2 | 18 | 5,5 | | | | | | | | | | | |
| | | 3 | 27 | 10,8 | | | | | | | | | | | |
| | | 4 | 36 | 15,4 | 5,5 | | | | | | | | | | |
| | | 5 | 45 | 18,6 | 8,1 | | | | | | | | | | |
| | | 6 | 54 | 23,7 | 10,8 | 5,5 | | | | | | | | | |
| | | 7 | 63 | 31 | 13,2 | 7,3 | | | | | | | | | |
| | | 8 | 72 | 36 | 15,4 | 9,1 | 5,5 | | | | | | | | |
| | | 9 | 81 | 42 | 17,2 | 10,8 | 6,9 | | | | | | | | |
| | | 10 | 90 | 48 | 18,6 | 12,3 | 8,1 | 5,5 | | | | | | | |
| | | 11 | 99 | 55 | 21 | 14 | 9,5 | 6,7 | | | | | | | |
| | | 12 | 108 | 62 | 23,7 | 15,4 | 10,8 | 7,6 | 5,5 | | | | | | |
| | | 2 | 13 | 117 | 69 | 27,4 | 16,6 | 11,9 | 8,7 | 6,5 | | | | | |
| | 14 | | 126 | 74 | 31 | 17,7 | 13,2 | 9,8 | 7,3 | 5,5 | | | | | |
| | 15 | | 135 | 79 | 34 | 18,6 | 14,3 | 10,8 | 8,1 | 6,4 | | | | | |
| | 16 | | 144 | 86 | 36 | 20,1 | 15,4 | 11,7 | 9,1 | 7,1 | 5,5 | | | | |
| | 17 | | 153 | 93 | 39 | 22 | 16,3 | 12,7 | 9,9 | 7,7 | 6,3 | | | | |
| | 18 | | 162 | 99 | 42 | 23,7 | 17,2 | 13,6 | 10,8 | 8,6 | 6,9 | 5,5 | | | |
| | 19 | | 171 | 104 | 45 | 26,2 | 17,9 | 14,5 | 11,5 | 9,3 | 7,5 | 6,2 | | | |
| | 20 | | 180 | 112 | 48 | 28,5 | 18,6 | 15,4 | 12,3 | 10,1 | 8,1 | 6,8 | 5,5 | | |
| | 21 | | 189 | 119 | 51 | 31 | 19,7 | 16,1 | 13,2 | 10,8 | 8,9 | 7,3 | 6,1 | | |
| | 22 | | 198 | 127 | 55 | 33 | 21 | 16,8 | 14 | 11,4 | 9,5 | 7,8 | 6,7 | 5,5 | |
| | 23 | | 207 | 133 | 59 | 35 | 22,4 | 17,5 | 14,7 | 12 | 10,2 | 8,5 | 7,1 | 6,1 | |
| | 24 | | 216 | 140 | 62 | 36 | 23,7 | 18,1 | 15,4 | 12,8 | 10,8 | 9,1 | 7,6 | 6,6 | 5,5 |
| | 3 | 25 | 225 | 146 | 66 | 38 | 25,6 | 18,6 | 16 | 13,5 | 11,4 | 9,7 | 8,1 | 7 | 6 |
| | | 26 | 234 | 151 | 69 | 40 | 27,4 | 19,4 | 16,6 | 14,2 | 11,9 | 10,2 | 8,7 | 7,4 | 6,5 |
| | | 27 | 243 | 158 | 72 | 42 | 29,1 | 20,5 | 17,2 | 14,8 | 12,5 | 10,8 | 9,3 | 7,8 | 6,9 |
| | | 28 | 252 | 166 | 74 | 44 | 31 | 21,6 | 17,7 | 15,4 | 13,2 | 11,3 | 9,8 | 8,4 | 7,3 |
| | | 29 | 261 | 173 | 77 | 46 | 32 | 22,6 | 18,2 | 15,9 | 13,8 | 11,8 | 10,3 | 8,9 | 7,6 |
| | | 30 | 270 | 181 | 79 | 48 | 34 | 23,7 | 18,6 | 16,5 | 14,3 | 12,3 | 10,8 | 9,4 | 8,1 |
| | | 31 | 279 | 188 | 83 | 50 | 35 | 25,2 | 19,2 | 16,9 | 14,8 | 12,9 | 11,2 | 9,9 | 8,6 |
| | | 32 | 288 | 196 | 86 | 52 | 36 | 26,7 | 20,1 | 17,4 | 15,4 | 13,4 | 11,7 | 10,3 | 9,1 |
| | | 33 | 297 | 202 | 89 | 55 | 38 | 28,1 | 21 | 17,8 | 15,9 | 14 | 12,1 | 10,8 | 9,5 |
| | | 34 | 306 | 212 | 93 | 58 | 39 | 29,4 | 22 | 18,2 | 16,3 | 14,4 | 12,7 | 11,2 | 9,9 |
| | | 35 | 315 | 221 | 96 | 60 | 40 | 31 | 22,8 | 18,6 | 16,8 | 14,9 | 13,2 | 11,6 | 10,4 |
| | | 36 | 324 | 229 | 99 | 62 | 42 | 32 | 23,7 | 19,1 | 17,2 | 15,4 | 13,6 | 12 | 10,8 |

(1) No Power redundancy

MODULYS XM
100 to 600 + 50 kW

1.2.2 MODULAR BATTERY CABINET - HIGH CAPACITY



| DIMENSIONS AND WEIGHT | |
|-----------------------|------|
| Height (mm) | 1990 |
| Depth (mm) | 890 |
| Width (mm) | 810 |
| Weight (kg) | 1792 |

Modular battery cabinets - high capacity are designed for long BUT also with higher power.

A standard temperature sensor optimizes the battery recharging parameters according to the ambient operating temperature to extend battery life.

| MODULAR BATTERY CABINET BACK-UP TIMES IN MINUTES @75% OF RATED LOAD | | | | | | | | | | | | | | | | |
|--|---------------------------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|------|
| Number of Power Modules | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | |
| N+1 redundant System Power (kW) | | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 | | | |
| Number of battery cabinets | Number of battery strings | Cumulative Ah | 1 | 90 | 49 | 19,8 | | | | | | | | | | |
| | | | 2 | 180 | 115 | 49 | 29,1 | 19,8 | 14,3 | | | | | | | |
| | | | 3 | 270 | 184 | 82 | 49 | 34 | 25,3 | 19,8 | 15,4 | | | | | |
| | | | 4 | 360 | 255 | 115 | 71 | 49 | 37 | 29,1 | 23,9 | 19,8 | 16,3 | 14,3 | | |
| | | | 5 | 450 | 329 | 148 | 93 | 66 | 49 | 39 | 32 | 26,6 | 23,1 | 19,8 | 16,8 | 14,9 |
| | | | 6 | 540 | 407 | 184 | 115 | 82 | 62 | 49 | 41 | 34 | 29,1 | 25,3 | 22,5 | 19,8 |

(1) No Power redundancy

2. SPECIFICATIONS

2.1 INSTALLATION PARAMETERS

| DIMENSIONS AND WEIGHT | | | | | | | | | | | | | |
|-------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Number of Power Modules | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Height (mm) | 1990 | | | | | | | | | | | | |
| Depth (mm) | 890 | | | | | | | | | | | | |
| Width (mm) | 1200 | | | | | | | | | | | | |
| Weight (kg) | 536 | 572 | 608 | 644 | 680 | 716 | 752 | 788 | 824 | 860 | 896 | 932 | 968 |

| RATED CURRENT AND MAX CURRENT | | | | | | | | | | | | | |
|--|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| Number of Power Modules | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| N+1 redundant System Power (kW) | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 | |
| Rated rectifier input current (A) (EN 62040-1) | 75 | 150 | 226 | 301 | 376 | 451 | 526 | 601 | 677 | 752 | 827 | 902 | |
| Max rectifier input current (A) (EN 62040-3) | 180 | 270 | 360 | 450 | 540 | 630 | 720 | 810 | 900 | 990 | 1080 | 1080 | |
| Nominal Inverter output current (A) | 72 | 144 | 217 | 289 | 361 | 433 | 505 | 577 | 650 | 722 | 794 | 866 | |
| Maximum bypass input current (A) (EN 62040-3) | 956 | | | | | | | | | | | | |
| Max battery current (A) | 228 | 342 | 456 | 570 | 684 | 798 | 912 | 1026 | 1140 | 1254 | 1368 | 1482 | |

(1) No Power redundancy

| COOLING | | | | | | | | | | | | | |
|--|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Power Modules | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| N+1 redundant System Power (kW) | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 | |
| Maximum air flow | (m3/h) | 1200 | 1800 | 2400 | 3000 | 3600 | 4200 | 4800 | 5400 | 6000 | 6600 | 7200 | 7800 |
| Power Dissipation in nominal conditions ⁽²⁾ | (W) | 1920 | 3950 | 6080 | 8110 | 10680 | 12820 | 15340 | 17530 | 19720 | 21920 | 24710 | 26950 |
| | (kcal/h) | 1650 | 3390 | 5220 | 6970 | 9180 | 11020 | 13180 | 15070 | 16950 | 18840 | 21240 | 23170 |
| | (BTU/h) | 6550 | 13470 | 20740 | 27670 | 36440 | 43740 | 52340 | 59810 | 67280 | 74790 | 84310 | 91950 |
| Power Dissipation (Max) in the worst conditions ⁽³⁾ | (W) | 2140 | 4390 | 6910 | 9430 | 12060 | 14470 | 16880 | 19730 | 22200 | 25220 | 27740 | 30920 |
| | (kcal/h) | 1840 | 3780 | 5950 | 8110 | 10370 | 12450 | 14520 | 16970 | 19090 | 21690 | 23860 | 26590 |
| | (BTU/h) | 7310 | 14980 | 23580 | 32180 | 41160 | 49380 | 57600 | 67330 | 75750 | 86060 | 94660 | 105510 |

(1) No Power redundancy

(2) nominal input voltage and rated output active power (PF=1)

(3) low input voltage, battery recharge and rated output active power (PF=1)

| ACOUSTIC NOISE | | | | | | | | | | | | | |
|---|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| Number of Power Modules | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| N+1 redundant System Power (kW) | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 | |
| Acoustic noise at 1m (dBA) ⁽¹⁾ | 53 | 50 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | |

(1) 70% of nominal load.

2.2 ELECTRICAL CHARACTERISTICS

2.2.1 ELECTRICAL CHARACTERISTICS INDEPENDENT OF THE NUMBER OF MODULES

| ELECTRICAL CHARACTERISTICS - INPUT | |
|--|---|
| Rated mains supply voltage (V) | 400 V 3-phase+N |
| Voltage tolerance at full load | 340 V to 480 V (+20/-15 %) |
| Voltage tolerance at derated load | up to 240 V @ 50% of nominal load (linear decrease) |
| Rated frequency (Hz) | 40 - 70 Hz |
| Power factor | > 0.99 ⁽¹⁾ |
| Total harmonic input current distortion (THDi) | ≤ 3% (@: Pn, Resistive load, Mains THDv ≤ 1 %) |
| Max inrush current at start-up | Power walk-in/Soft-start (selectable parameters) |

(1) $P_{out} \geq 50\%$ of nominal Power.

| ELECTRICAL CHARACTERISTICS - BYPASS | |
|-------------------------------------|--|
| Bypass rated voltage (V) | Nominal output voltage ±15% (±20% if GENSET is used) |
| Bypass rated frequency (Hz) | 50/60 |
| Bypass frequency tolerance | ±2% selectable (±8% if GENSET is used) |
| Bypass frequency variation speed | 50/60 ±10% |

| ELECTRICAL CHARACTERISTICS - INVERTER | |
|--|---|
| Rated output voltage (V) | (3ph + N) 400 380/400/415 selectable |
| Output voltage tolerance (V) | ±1% |
| Rated output frequency (Hz) | 50/60 (selectable) |
| Output frequency tolerance | ±0.05% (on battery mode) |
| Load crest factor | ≥ 2.7:1 |
| Total output voltage distortion (THDv) | ≤ 1% (Ph/Ph); ≤ 2% (Ph/N) (@: Pn, Resistive load) |

| ELECTRICAL CHARACTERISTICS - STORED ENERGY OPERATING MODE | |
|---|------------------------------------|
| Number of battery blocks (VRLA) | From 18+18 to 24+24 ⁽¹⁾ |

(1) Consult us

| ELECTRICAL CHARACTERISTICS - EFFICIENCY | |
|---|--------------|
| Efficiency (on-line mode) | up to 96.5 % |
| Efficiency (eco-mode) | up to 99.3 % |

| ELECTRICAL CHARACTERISTICS - BYPASS OVERLOAD AND SHORTCIRCUIT | | | |
|---|------------|----------|---------------------------|
| Solution type | | Standard | High Short-circuit (*) |
| Number of Bypass Modules | | 2 | 2 or 2 + 1 ⁽¹⁾ |
| Number of Power Modules | | 2 → 13 | |
| Bypass overload (A) | Nominal | 362 | 362 |
| | Continuous | 398 | 398 |
| | 10' | 453 | 453 |
| | 1' | 543 | 543 |
| | 1" | 634 | 634 |
| Bypass Max short-circuit current ITSM (A) | | 20 ms | 28000 |
| Bypass I2t (A2s) | | 3920000 | 8000000 |

(1) Extra Bypass Module (option) for higher Bypass short-circuit capability

| ELECTRICAL CHARACTERISTICS - SYSTEM SHORTCIRCUIT SAFETY PERFORMANCE | | | |
|---|--|----------|----------------------------------|
| Solution type | | Standard | High Short-circuit (*) |
| Number of Bypass Modules | | 2 | 2 or 2 + 1 ⁽¹⁾ |
| Number of Power Modules | | 2 → 13 | |
| Short circuit current withstand (Icw) | | 20 kA | 35 kA up to 65 kA ⁽²⁾ |

(1) Extra Bypass Module (option) for higher Bypass short-circuit capability (2) option - contact us

(*) High short-circuit solution:

- Extra-rugged system for enhanced short-circuit safety performance (above IEC/EN 62040-1 requirements)
- Ready for +1 extra Bypass Module (option) for higher Bypass short-circuit capability

2.2.2 ELECTRICAL CHARACTERISTICS DEPENDENT ON THE NUMBER OF MODULES

| ELECTRICAL CHARACTERISTICS - Inverter overload and short-circuit | | | | | | | | | | | | | |
|--|--------------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Power Modules | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| N+1 redundant System Power (kW) | | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 |
| Inverter overload (kW) ⁽²⁾ | 10 min | 125 | 187,5 | 250 | 312,5 | 375 | 437,5 | 500 | 562,5 | 625 | 687,5 | 750 | 750 |
| | 5 min | 132 | 198 | 264 | 330 | 396 | 462 | 528 | 594 | 660 | 726 | 792 | 792 |
| | 1 min | 150 | 225 | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 900 |
| Inverter short-circuit (A) Ik1 = Ik2 = Ik3 | 40 ms | 390 | 585 | 780 | 975 | 1170 | 1365 | 1560 | 1755 | 1950 | 2145 | 2340 | 2535 |
| | 40 to 100 ms | 324 | 486 | 648 | 810 | 972 | 1134 | 1296 | 1458 | 1620 | 1782 | 1944 | 2106 |

(1) No Power redundancy

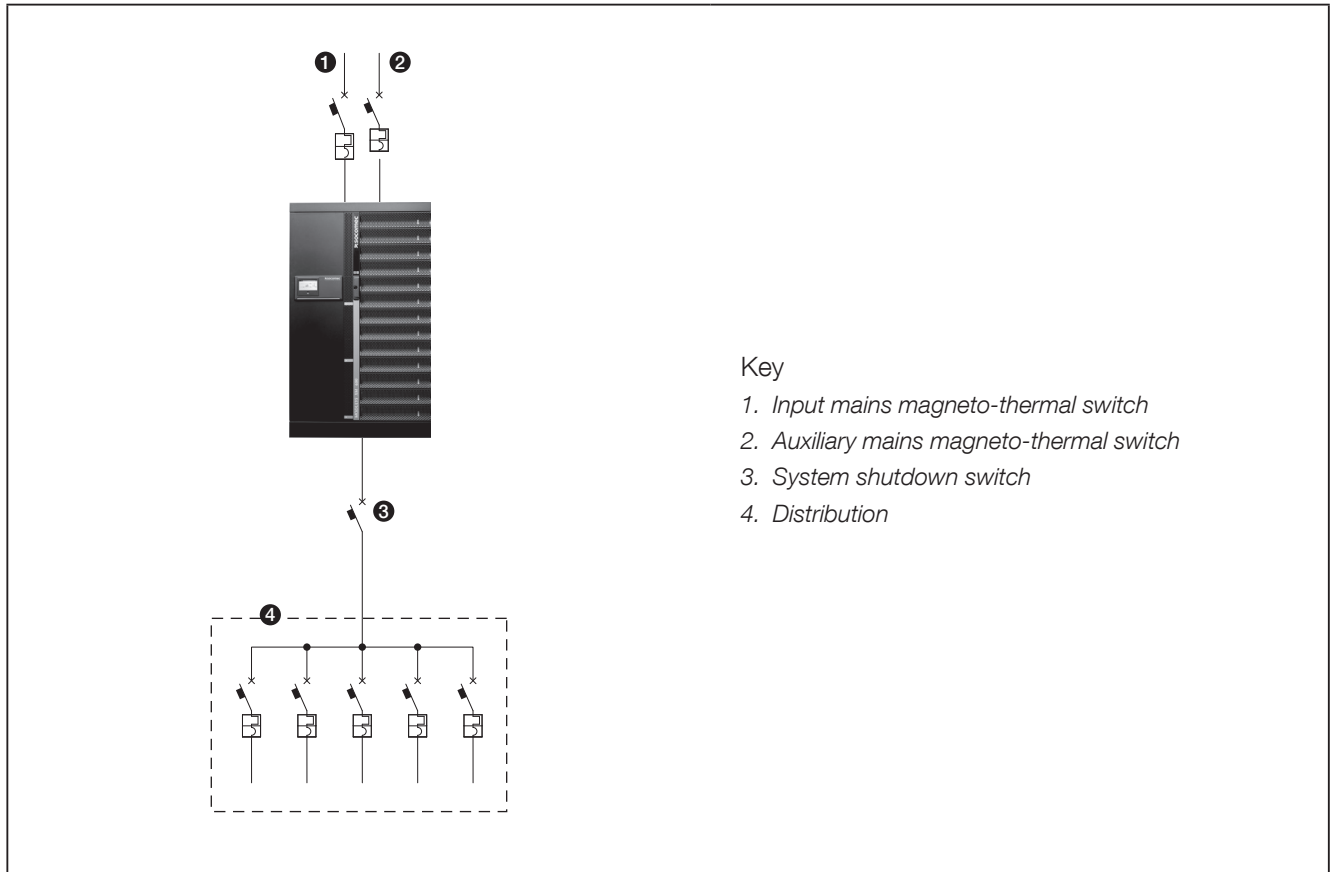
(2) Conditions: Initial Pout ≤ 80% Pn, Vin nominal

| ELECTRICAL CHARACTERISTICS - Battery Charger Max Current | | | | | | | | | | | | | |
|--|--|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Power Modules | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| N+1 redundant System Power (kW) | | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 |
| Max Current (A) | | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 |

(1) No power redundancy

2.3 RECOMMENDED PROTECTION

2.3.1 SYSTEM FROM 50 TO 600 + 50 kVA



The installation and system should comply with national plant regulations.

The electrical distribution panel should have a sectioning and protection system installed for input and auxiliary mains.

| SYSTEM CABLES - MAX SECTION | | |
|--|----------|---------|
| Number of Modules | | 1 → 13 |
| Rectifier terminals (mm ²) | Flexible | 3 x 240 |
| | Rigid | 3 x 240 |
| Bypass terminals (mm ²) | Flexible | 3 x 240 |
| | Rigid | 3 x 240 |
| Battery terminals (mm ²) | Flexible | 3 x 240 |
| | Rigid | 3 x 240 |
| Output terminals (mm ²) | Flexible | 3 x 240 |
| | Rigid | 3 x 240 |

M10 terminals for In, Aux and Out; M12 for battery connections

Tightening torque 20Nm

Max section is determined by the size of the terminals.

As specified in EN 62040-3 Appendix 3 (Non-Linear Load Reference), in the event of three-phase non-linear loads connected downstream of the UPS, the neutral current on the load can be 1.5 - 2 times higher than the phase current. This should be taken into account when estimating the correct size of the output and the auxiliary neutral cables.

| RECOMMENDED PROTECTION DEVICES - Rectifier | | | | | | | | | | | | | |
|--|-----|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Modules | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| N+1 redundant System Power (kW) | | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 |
| C Curve circuit breaker (A) | Min | 200 | 320 | 400 | 630 | 630 | 630 | 800 | 1000 | 1000 | 1000 | 1250 | 1250 |
| | Max | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 |

(1) No Power redundancy

(2) Caution! Residual Current Detection (RCD) can only be used with a common input and auxiliary mains (configuration not recommended). It must be placed upstream of the connection between input mains and auxiliary mains. Use type B fourpole selective (S) residual current detectors. Load leakage currents are to be added to those generated by the UPS and during transitory phases (power failures and power returns) short current peaks may occur. If loads with high leakage current are present, adjust the residual current protection. It is advisable in all cases to carry out a preliminary check on the earth current leakage with the UPS installed and operational with the definitive load, to prevent the RCD tripping over.

A circuit breaker switch is recommended with magnetic intervention threshold $\geq 10 I_n$.

It is necessary to use a circuit breaker with $I_m \leq 20 \times I_n$ (A) selective breaker if an optional external transformer is used. The min value depends on the size of the power cables in the installation, while the max value is limited by the UPS cabinet.

The system can accept the max. value of protection, whatever the number of modules installed, in order to allow future scalability, while the min. value depends on the size of the power cables in the installation. A value of protection less than Max shall be used when the mains network structure cannot support the full power load, and shall be chosen between max. and min. values (as per the table above) according to mains network design.

Rectifier protection should be taken into account in the event of separate inputs; when the auxiliary mains and rectifier inputs are combined (common input), the general input protection rating should be higher than both (auxiliary mains or rectifier).

| RECOMMENDED PROTECTION DEVICES - Auxiliary mains | | | | | | | | | | | | | |
|--|-----|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Modules | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| N+1 redundant System Power (kW) | | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 |
| C Curve circuit breaker (A) | Min | 200 | 320 | 400 | 630 | 630 | 630 | 800 | 1000 | 1000 | 1000 | 1000 | 1000 |
| | Max | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 |

(1) No Power redundancy

A circuit breaker switch is recommended with magnetic intervention threshold $\geq 10 I_n$.

It is necessary to use a circuit breaker with $I_m \leq 20 \times I_n$ (A) selective breaker if an optional external transformer is used. The min value depends on the size of the power cables in the installation, while the max value is limited by the UPS cabinet.

The conditional short circuit current (I_{cc}) according to IEC 62040-1 is 65KA rms, provided that the UPS is protected by a MCCB with adequate breaking capability and current limiting capability under short circuit conditions. Contact us for detailed information.

| RECOMMENDED PROTECTION DEVICES - Upstream Residual Current Detection Circuit Breaker | | | | | | | | | | | | | |
|--|-----|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Modules | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| N+1 redundant System Power (kW) | | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 |
| Differential input (A) | Min | | | | | | | | | | | | |

(1) No Power redundancy

An RCD is not necessary when the UPS is installed in TN-S system. RCDs are not allowed on TN-C systems. If an RCD is required, a B type should be used.

Caution! Use four-pole selective (S) residual current detectors (RCDs). Load leakage currents are to be added to those generated by the UPS and during transitory phases (power failures and power returns) short current peaks may occur. If loads with high leakage current are present, adjust the residual current protection. It is advisable in all cases to carry out a preliminary check on the earth current leakage with the UPS installed and operating with the definitive load, so as to prevent the sudden activation of the RCD switch.

| OUTPUT SELECTIVITY ON BATTERY MODE (AUX MAINS NOT PRESENT) | | | | | | | | | | | | | |
|--|-----|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Modules | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| N+1 redundant System Power (kW) | | 100+0 ⁽¹⁾ | 100+50 | 150+50 | 200+50 | 250+50 | 300+50 | 350+50 | 400+50 | 450+50 | 500+50 | 550+50 | 600+50 |
| Circuit breaker with $I_m \leq 5 \times I_n$ (A) | Max | 50 | 80 | 100 | 125 | 125 | 200 | 200 | 250 | 250 | 250 | 250 | 250 |
| Circuit breaker with $I_m \leq 10 \times I_n$ (A) | Max | 25 | 40 | 50 | 63 | 80 | 100 | 100 | 125 | 125 | 160 | 160 | 160 |

(1) No Power redundancy

3. REFERENCE STANDARDS AND DIRECTIVES

3.1 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.

3.2 STANDARDS

| STANDARD | |
|-----------------------|--|
| Safety | EN/IEC 62040-1 - AS 62040-1 |
| EMC | EN/IEC 62040-2 - AS 62040-2 |
| Product certification | IECEE CB Scheme |
| Performance | EN/IEC 62040-3 - AS 62040-3 |
| Product marks | CE - RCM ⁽¹⁾ - EAC ⁽¹⁾ - CMIM ⁽¹⁾ - UKCA ⁽¹⁾ |
| Protective class | Protective Class I |
| Protection level | IP20 |

(1) Depends on the production site. Consult the data plate on the equipment



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.