

# Sentryum Rack Marine



ONLINE



Modular



Service  
1st start



SmartGrid  
ready



USB  
plug



**1-3:1** 20-160 kVA/kW

**1-3:3** 20-160 kVA/kW

## HIGHLIGHTS

- **High adaptability to input voltage**
- **Compatible with marine environments**
- **High performance high yield strength steel cabinet**
- **No clearance required around the cabinet**
- **Modular Plug & Play solution**
- **Suitable for stand alone and modular installations**
- **Complete flexibility**
- **Graphic touch screen display on both the module and cabinet front door**

The Sentryum Rack Marine range was specially developed to ensure power continuity in all sectors deemed critical due to the specific environmental conditions or marine processes requiring protection.

It is a true ON LINE double conversion UPS, available in a 20 kVA/kW standalone version and in modular versions from 20 to 160 kVA/kW. The Sentryum Rack Marine is available in both single-phase and three-phase output configurations. It accepts both single-phase and three-phase inputs with no need for special setup or operator intervention. The voltage arrangement could change during operation without any reset or manual operation, therefore the UPS auto detects the input voltage and behaves accordingly.

## COMPATIBLE WITH MARINE ENVIRONMENTS

The basic building block is a 20 kVA/kW module. Its connection clamps are laid out so that the communication signal connections are segregated and separated from the power connections (inputs, output, battery), thus ensuring complete immunity from interference generated by the power supply grid, which is typically disturbed in marine environments. The module has a front to back air flow realised by a smart ventilation principle, which manages the fan speed and airflow in accordance with the room temperature and load level. The PCBs in each module undergo a coating treatment process. As all components are fully accessible

from the front of each module and thanks to the front-to-front air ventilation system, the Sentryum Rack Marine cabinet can be installed right against the wall or back to back. The construction characteristics of the cabinet (fiber laser welded box-type uprights manufactured from high-strength low-alloy sheet steel), including its basement complete with vibration dampers, make the Sentryum Rack Marine suitable for installation in the most severe environments.

The Sentryum Rack Marine cabinet is available in 2 versions, single-phase and three-phase output; it is designed to house up to 3 modules (60 kVA/kW) and it can be connected in parallel for a total of 8 modules and 160 kVA/kW of power. The Sentryum Rack Marine cabinet has a distribution panel that contains all the devices to disconnect each module (3 input rectifier disconnectors, 3 input bypass disconnectors, 3 output disconnectors, 3 battery fuse holders), as well as a manual maintenance bypass that isolates the 3 modules and guarantees power continuity to the load. Both modules and cabinets are provided with the bypass line separated from the rectifier line, ensuring greater availability of the power supply to the UPS system and consequently extending this benefit to the load. Input and Output voltage adapter cabinets are available on request, in order to match all the typical ship requirements and provide the galvanic isolation.

#### **MODULAR PLUG & PLAY SOLUTION**

Sentryum Rack Marine can be purchased as a single 20 kVA/kW module and installed in a 19-inch rack cabinet or mechanical support provided by the user. Another way is to lean the module on the right side; the display can be rotated 90° counter clockwise. It is also possible to remote the display (maximum 2 meters) in case the module is fitted inside a cabinet. The power terminals (inputs, output, battery) are connected by front hating connectors, ensuring simplicity and operating safety during insertion/removal, protection against electrical contacts and immunity from environmental conditions typical of marine settings (dust, humidity, brackish atmosphere, suspended chemical particles). The removal and replacement of a faulty module or the addition into the system of a new one can be carried out easily by the user from the front panel.

#### **FLEXIBILITY: STAND ALONE AND RACK CABINET**

The Sentryum Rack Marine module can be used as a standalone unit or in a parallel configuration; by simply adding the parallel kit for each module, the UPS system can grow as requirements demand (from 20 to 160 kVA/kW). Every module is completely independent with regards to the control and management of the operator interfaces; this facilitates all monitoring, control and fault detection operations, ensuring increased reliability in that any malfunctions in parts or accessories will not propagate through the entire system. Sentryum Rack Marine offers vertical scalability that minimises the system footprint; the user can have power capabilities from 20 to 60 kVA/kW in a single Sentryum Rack Marine cabinet without increasing the footprint. The 20 kVA/kW module in the standalone version is provided with input/output plug-in hating power connectors (inputs, output, battery) with three meter length loose electrical cable to arrange the cabling according with the installation enclosure. These cables are not provided when the module is ordered to be fitted inside the Sentryum Rack Marine cabinet, because they are already installed inside it as standard. Standalone module versions can be housed in any suitable cabinet or enclosure as it is compatible with standard 19" width.

#### **HIGH EFFICIENCY, POWER AVAILABILITY AND RELIABILITY**

This Series is derived from the Sentryum and essentially inherits its main technologies and standalone module versions:

- Full power rating available up to 45 °C (kVA=kW unity pf) and up to 96.3% VFI efficiency;
- Zero impact source, thanks to a very low input THDi <3%, input pf 0.99, power walk-in function, power walk-in start delay function;
- Up to 20 Amps battery recharging current and wide battery block range (the standard 20+20 battery blocks @ 12V with Neutral central point can be adjusted from 15+15 to 22+22);
- Three-level IGBT inverter, extremely low output THDv;
- Up to 270% inverter current for 200 msec. and 150% for 300 msec., which enables the system to deal with sudden peak loads (without static bypass intervention) and provide the short circuit current if required during operation on battery;
- "Cold start" function for starting the UPS from the battery.

In addition, Sentryum Rack Marine provides a filtering and power factor correction function within the power network upstream of the UPS, thus eliminating harmonic components and reactive power generated by the power utilities.

#### **SMART BATTERY MANAGEMENT**

The Smart Battery Management system, which is also compatible with Li-Ion batteries and Supercapacitors, consists of a series of features and capabilities to optimise battery management and obtain the best possible performance and operating life:

- Battery recharging for use with VRLA, AGM, GEL, Open Vented and Nickel Cadmium batteries;
- Availability of different charging methods, like one-level voltage recharge (typically used for VRLA AGM batteries), two-level voltage recharge (according to IU specification) and Cyclical recharge (to reduce electrolyte consumption and lengthen the life of VRLA batteries);
- Recharge voltage compensation based on ambient temperature;
- Battery tests to diagnose in advance any reduction in performance or problems with the batteries;
- Deep discharge protection, by increasing the end-of-discharge voltage during extended low-load discharges, as recommended by battery manufacturers;
- Negligible Ripple current (residual AC component at low frequency) by using a high frequency battery charger;
- Wide voltage range for the rectifier operating (up to -40% at half load).

#### **ADVANCED COMMUNICATIONS**

Sentryum Rack Marine module is equipped with a coloured graphic touch screen display providing UPS information, measurements, operating statuses and alarms in different languages. The default screen displays the UPS status, graphical indication of the energy path through the UPS and the operational condition of the various assemblies (rectifier, batteries, inverter, bypass) within the UPS. Furthermore, the user interface includes a UPS status led bar which delivers immediate and clear information regarding the overall status of the UPS by changing the colour (light blue, dark blue, orange and red) according with the operating mode and condition. Thanks to the 10" touchscreen colour display (capacitive) placed on the front door of the Sentryum Rack Marine cabinet, it is possible to monitor the whole UPS System and the status of each power module fitted inside the cabinet.

- Advanced multi-platform communications for all operating systems and network environments: PowerShield3 monitoring and shutdown software included for Windows operating systems 11, 10, 8, Hyper-V, Server 2022, 2019, 2016 and previous versions, Windows Server Virtualization Hyper-V, macOS, Linux, Citrix XenServer and other Unix operating systems;
- Compatible with VMware infrastructures to perform graceful shutdown of hosts and clusters; to perform Vmotion and prioritized shutdown of VM thanks to

- NetMan 208 Network card;
- Compatible with Nutanix and Syneto infrastructures to perform graceful shutdown of hosts; to perform prioritized shutdown of VM thanks to NetMan 208 Network card;
- Compatible with RielloConnect (remote monitoring service);
- RS232 port on RJ10 connector and USB ports;
- 2 slots for optional communications cards such as network adaptors and volt free contacts etc;
- Embedded contact interface which

- includes 5 programmable inputs and 4 programmable outputs;
- R.E.P.O. Remote Emergency Power Off for switching off the UPS via a remote emergency button;
- Graphic display panel for remote connection.



Sentryum Rack Marine Module (Stand alone solution fitted inside a 19" rack cabinet) – Compatible for installation in any 19" enclosure.

## OPTIONS

### SOFTWARE

PowerShield<sup>3</sup>  
PowerNetGuard

### ACCESSORIES

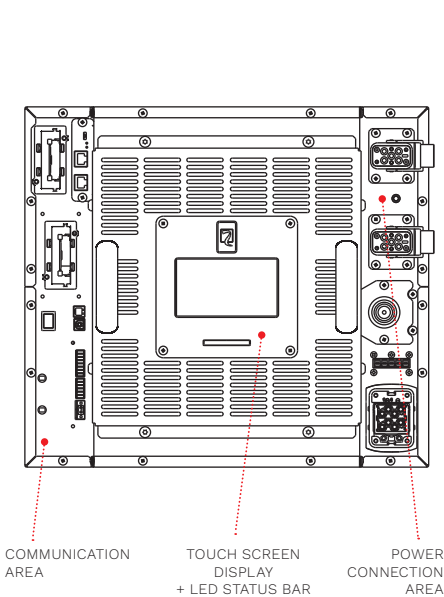
NETMAN 208  
MULTICOM 302  
MULTICOM 352  
MULTICOM 384  
MULTICOM 411  
MULTICOM 421  
MULTI I/O  
MULTIPANEL

### PRODUCT ACCESSORIES

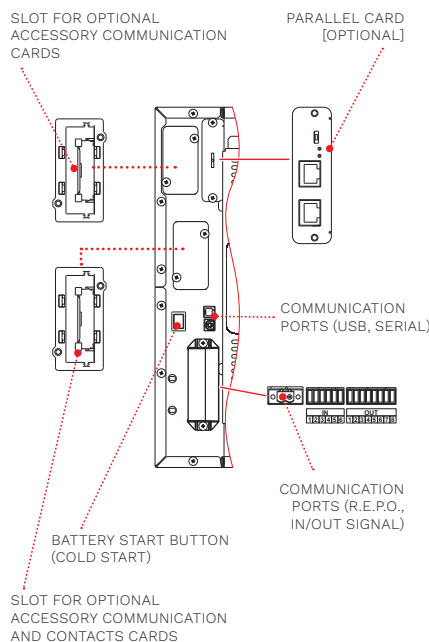
Parallel Kit  
Battery temperature sensor  
MULTICOM 392  
ENERGYMANAGER

## DETAILS

### Sentryum Rack Marine (UPS MODULE - front)

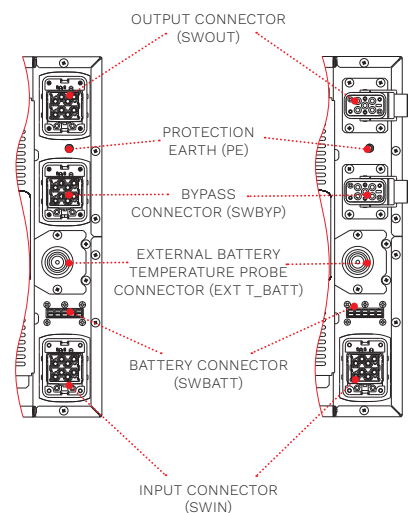


### Communication Area



### Power Connection Area

Single-phase version      Three phase version



<b>MODELS</b>	<b>Single-phase output (SMM) from 20 kVA/kW to 160 kVA/kW</b>	<b>Three-phase output (SMT) from 20 kVA/kW to 160 kVA/kW</b>
<b>INPUT</b>		
Rated voltage [V]	220 / 230 / 240 single-phase + N and 380 / 400 / 415 three-phase + N	
Rated frequency [Hz]	50 / 60	
Voltage tolerance [V]	230 / 400 ±10% @ full load <sup>1</sup>	
Frequency tolerance [Hz]	40 - 72	
Power factor @ full load	0.99	
Current distortion	THDI ≤3%	
<b>BYPASS</b>		
Rated voltage [V]	220 / 230 / 240 single-phase + N	380 / 400 / 415 three-phase + N
Number of phases	1 + N	3 + N
Voltage tolerance (Ph-N) [V]	from 180 (adjustable 180-200) to 264 (adjustable 250-264) referring to neutral	
Rated frequency [Hz]	50 or 60 (selectable)	
Frequency tolerance	±5% (selectable)	
Bypass overload	110% infinite, 125% for 60 min., 150% for 10 min.	
<b>OUTPUT</b>		
Nominal power [kVA]	20	
Active power [kW]	20	
Power factor	1 up to 45 °C	
Number of phases	1 + N	3 + N
Rated voltage [V]	220 <sup>1</sup> / 230 / 240 single-phase + N (selectable)	380 <sup>1</sup> / 400 / 415 three-phase + N (selectable)
Rated frequency [Hz]	50 or 60	
Frequency stability on battery operation	0.01%	
Voltage stability	±1%	
Dynamic stability	EN 62040-3 class performance 1 non-linear load	
Voltage distortion	<1% with resistive linear load / ≤1.5% with non-linear load	
<b>BATTERIES</b>		
Type	VRLA AGM/GEL/NiCd/Li-ion/SuperCaps	
Recharging method	One level, Two level, Cyclic recharge (selectable)	
<b>OVERALL SPECIFICATIONS</b>		
Weight of the Power Module [kg]	41	
Dimensions of the Power Module (WxDxH) [mm]	445(19")x664x397(9U)	
Weight of the cabinet [kg]	165 (Power Modules excluded) <sup>3</sup>	
Dimensions of the Power Cabinet (WxDxH) [mm]	615x830x2100 (if provided by Riello UPS) <sup>3</sup>	
Maximum number of Power Modules for cabinet	3	
Communications for each Power Module	UPS status led bar - 5 inch graphic touch screen display - 2 slots for communications interface USB - RS232 - Contact interface with 5x opto insulated Input and 4x Output relays	
Ambient temperature for the Power Module	0 °C - +45 °C	
Recommended temperature for battery life	+20 °C - +25 °C	
Range of relative humidity	5-95% non-condensing	
Colour	Module RAL 7035 <sup>4</sup>	
Noise level at 1 m [dBA ±2] SMART ACTIVE	<40 for the single power module	
IP rating	IP20	
SMART ACTIVE efficiency	up to 99%	
Standards	European directives: LV 2014/35/EU low voltage Directive EMC 2014/30/EU electromagnetic compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2; RoHS compliant Classification in accordance with IEC EN 62040-3 (Voltage Frequency Independent) VFI - SS - 111 <sup>2</sup>	
Moving the parts	Pallet jack (UPS cabinet) - 2 operators (UPS Power Module)	

<sup>1</sup> For wider tolerance conditions apply.

<sup>2</sup> Marine Type Approval (in progress).

<sup>3</sup> The overall dimensions of the complete UPS system depend on the required configuration.

<sup>4</sup> The external colour of the Cabinet can be customised according to the customer's needs using the RAL colour matching system.