

RELIABLE
POWER FOR A
SUSTAINABLE
WORLD

NORTH AMERICA CATALOG



Reliable power for a sustainable world

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UPS for North American Standards

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Key

1:1

Single-phase input and output

3:3

Three-phase input and output



UPS ON LINE
(Voltage Frequency Independent)



Tower



Rack / Tower



UPS suitable for home
small office applications



UPS suitable for
data Center applications



UPS suitable for
electro-medical applications



UPS suitable for
industrial applications



UPS suitable for
transport applications
(railways, airports, naval)



UPS suitable for
emergency applications



UPS with “cULus listed”
certificate for North America



UPS with “TUV Rheinland”
certificate for North America



UPS ready for use in Smart Grids



AN INTRODUCTION TO RIELLO UPS AMERICA

RPS America Inc. is a member of the Riello Elettronica Group, the fifth largest manufacturer of Uninterruptible Power Supplies (UPS) in the world.

With over 35 years experience in the power conversion, the Riello Elettronica Group delivers, through its main brand Riello UPS, innovative energy-efficient, scalable and cost-effective power solutions to guarantee quality energy for Data Centers, Electromedical and Healthcare applications, Lights Emergency, Industrial Facilities, Telecommunication and Offices (SoHo).

The pursuit of quality, the optimization of resources, and a strong drive towards technological innovation, together with seriousness, consistency, and experience, make RPS America Inc. a company able to meet the needs of a fast-growing market.

Why we're a leader in mission critical applications

- Over 35 years' experience (EST. 1986) in the supply and service of power quality systems for mission critical applications.
- Extensive field service coverage.
- Depended upon by key global accounts for power continuity and support.
- R&D focused on innovative engineering of power systems.
- Worldwide Distribution Network.
- Recipient of awards for engineering and design.



Products and solutions overview

Riello UPS' approach to market is solutions based – understand customer continuity goals and configure a solution to meet these goals.

The solutions typically integrate UPS, Switchgear, Battery Systems, network interfaces, software and services, all of which **can be provided from the North America headquarters in West Chester Ohio.**





PRESALES: **expertise at your disposal for every needs**

Our Presales experts have been working in the power sector for years. They come from a range of backgrounds and enjoy a wealth of technical experience in sectors such as Data Centers, Industry and Power Plants.

By adopting a consultative, honest approach, our engineers and technicians support customers to achieve the perfect outcomes in power quality and power protection for their business.

Consultancy on standards

Our technicians provides professional support to help customers comply with all necessary regulations (UNI, ISO or UL CSA standards), and related requirements, including the issues of energy management and safety protection.

Presales support for:

- UPS sizing;
- Installation and configuration requirements;
- Customized solutions with a “pay as you grow” approach;
- Tailored systems providing optimal CapEx and OpEx;
- Technical specifications;

Presales Help Desk

Presales support is available by phone or email.

MAINTENANCE AND TECHNICAL SERVICE: **guaranteeing the performance and quality of our products over time**

By adopting a highly professional approach, our engineers and technicians provide reliable and qualified technical support that enables our customers to promptly solve any problem that may occur to their power protection systems.

In addition, the Service Team's ability to analyze data from the UPS encourages preventive, predictive or corrective maintenance. In this way, any necessary interventions can be scheduled cyclically, minimising the likelihood of a fault and enabling prompt intervention in the event of sudden problems or unexpected anomalies.

From electrical installation and commissioning to ongoing maintenance and product training, our Service Team is constantly committed to achieving the target of zero downtime of the installed Riello UPS power continuity solutions and lead the customers into the future of the real-time energy management.



RELYING ON THE RIELLO UPS SERVICE MEANS:

EXPERIENCE

extensive knowledge of the product and its use in every application, made possible by an ongoing process of training our technicians and keeping them constantly up-to-date with the latest trends.

EXPERTISE

constant communication between the Service and Research and Development teams enables a continuous exchange of information and technical knowhow.

PRESENCE

Riello UPS ensures a widespread coverage of its Service structure throughout each national territory. It deploys a network of professional and expert Help-Desk operators to provide immediate responses to customers. This is complemented by a group of highly-trained and competent technicians and service engineers that can quickly be deployed for on-site interventions.

SPEED

faults and failures can be quickly repaired thanks to a broad network of service engineers in each territory, plus the immediate availability of spare parts stored across various strategically-placed locations.

CONTROL

performance and efficiency can be precisely optimised thanks to ongoing on-site maintenance or through the Riello Connect remote monitoring platform.

COVERAGE

Riello UPS enjoys a growing presence throughout the world thanks to its local branches and distributors who work together in mutual cooperation to meet the customers' needs.

Our Service Team also provides UPS Training.

For more information contact us to
info@rielloupsamerica.com



WE PROVIDE RELIABLE ENERGY THROUGHOUT THE WORLD.

Area SoHo UPS (Small Office/Home Office)

Consip (Italy)
Carrefour (Italy)
Ikea (Sweden)
Hilton Hotel (Germany)
Mc Donald's (Germany)
Royal Intern. (U.A.E.)
Intermarché (Portugal)
Carrefour (France)
Lonely Planet (Australia)
Tesco (UK)

Area Data Center

China Mobile (China)
Telecom (Corea)
German Government
(Germany)
Deutsche Bank (Germany)
Allianz (Germany)
Samsung India Electronics
(India)
Telecom Italia (Italy)
ENI (Italy)
Enel (Italy)
Globalswitch (Spain)
Telefonica (Spain)
Infinity (UK)
British Telecom (UK)

Area Medical

Country Hospital Graz (Austria)
Krankenhaus (LKH) Salisburgo
(Austria)
Clinique De La Sauvegarde,
Lyon (France)
Tropical Medicine Centre,
Marseilles (France)
Civil Hospital, Lyon (France)
Klinikum Süd Nürnberg
(Germany)
Universitätsklinikum Aachen
(Germany)
Ospedale le Molinette, Turin
(Italy)
Ospedale Cardarelli, Naples
(Italy)
E-HWA University Hospital,
Seoul (Korea)
Apollo Hospital, Colombo (Sri
Lanka)

Area Industry

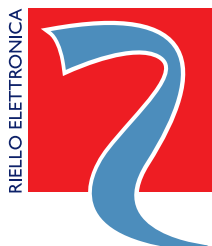
Mannesmann (Germany)
Audi (Germany)
Adidas (Germany)
HT Media (India)
Benetton Treviso (Italy)
Ilva (Italy)
La Doria (Italy)
Fincantieri (Italy)
Repsol (Spain)
Global Suit (Spain)
Ericsson (Sweden)
Ece (Russia)
Phillips (UK)

Area Transport

Munich airport (Germany)
Hamburg railway station
(Germany)
Underground Railway line C,
Rome (Italy)
Underground Railway, Turin
(Italy)
Barajas Madrid Airport (Spain)
High Speed Train A.V.E. (Spain)
CDG airport Paris (France)
Underground Railway, Paris
(France)
Johannesburgh International
Airport (South Africa)
Dubai Underground Railway
(U.A.E.)
Etihad Airway (U.A.E.)
Peking Airport (China)
Nanjing Underground Railway
(China)
Mumbai Metro (India)

Area Emergency Lighting

Juventus Stadium (Italy)
Malpensa Airport (Italy)
Allianz Arena Stadium
(Germany)
Ellispark Stadium (South Africa)
Loftus Stadium (South Africa)
Barcellona Olympic Stadium
(Spain)
Slavia Stadium Prague (Czech
Republic)



The Riello Elettronica Group

A world without energy is unthinkable. Everything moves and depends on energy. In our advanced societies, any interruption in the supply of power including a complete mains supply failure demonstrates how fundamental energy is to our daily lives. Riello Elettronica is the holding of a Group of companies whose core business is providing solutions that ensure quality power for business continuity, where the Group - with the brand Riello UPS - is permanently ranked among the top 5 players worldwide. However, power is not the only business; the Group have a strong presence in the home automation and security markets as well as in the real estate field.



Leader in the power continuity thanks to a comprehensive range of professional UPS (Uninterruptible Power Supplies).



Photovoltaic Inverter (PV) to cover every need, from small domestic systems to solar power plants.



Systems for intrusion, fire alarm and domotics.



Products for the safety of workers in dangerous areas.



A wide range of automation systems for access control.



Hydraulic plants, lubrication and automation installations for a wide variety of manufacturing applications.



- Power
- Automation & Security
- Real Estate



Technology and innovation have always been the hallmarks of Riello Elettronica. Since its incorporation they are the drivers behind our success and the outward expression of the entrepreneurial legacy that has its roots in Verona and its surrounding areas. Continuing growth and successful figures; this is Riello Elettronica, expression of its entrepreneurial tradition towards innovation, global challenges and the development of technology 'made in Italy' in international markets.

300
MILLION €
TURNOVER

1150
EMPLOYEES

85
BUSINESS
COUNTRIES

30
COMPANIES

7
PRODUCTION
SITES

DUCATI CORSE



Official
Sponsor

Riello UPS is the official sponsor of the Ducati Corse MotoGP Team.

Our partnership with Ducati provides Riello UPS with high levels of visibility and worldwide prestige. The two companies share values and principles that unite them in perfect synergy.

PERFECT SYNERGY

RIELLO UPS AND DUCATI
TOGETHER SINCE 2007



High performance
Unlimited energy
Italian technology.
These are the values
we share with Ducati.

Main Sponsor



Riello UPS is the main sponsor of the Aruba.it Racing - Ducati Team.

The collaboration best represents the Riello UPS philosophy, which in partnership with Aruba.it and Ducati, produces a close-knit and productive team that achieves goals and results of absolute excellence.



Riello UPS races into the future with FORMULA E and Audi Motor Sport

Electricity, future-oriented technology, **innovation**, **smart energy** management and above all “**green**” are the key drivers behind the ongoing commitment of Riello UPS and Audi to Formula E.



Audi Sport Official Partner

Riello UPS is an official partner of the Audi Sport Abt Schaeffler Formula E team in the FIA Formula E Championships. Formula E embodies the philosophy of Riello UPS: green technology that reduces pollution at the same time as enhancing performance, demonstrating how electric single-seaters can deliver true excellence. Electric cars are the future of mobility and Riello UPS, with its efficient products and Smart Grid Ready solutions, represents the future of high quality, sustainable energy.



Riello UPS

Brand Values

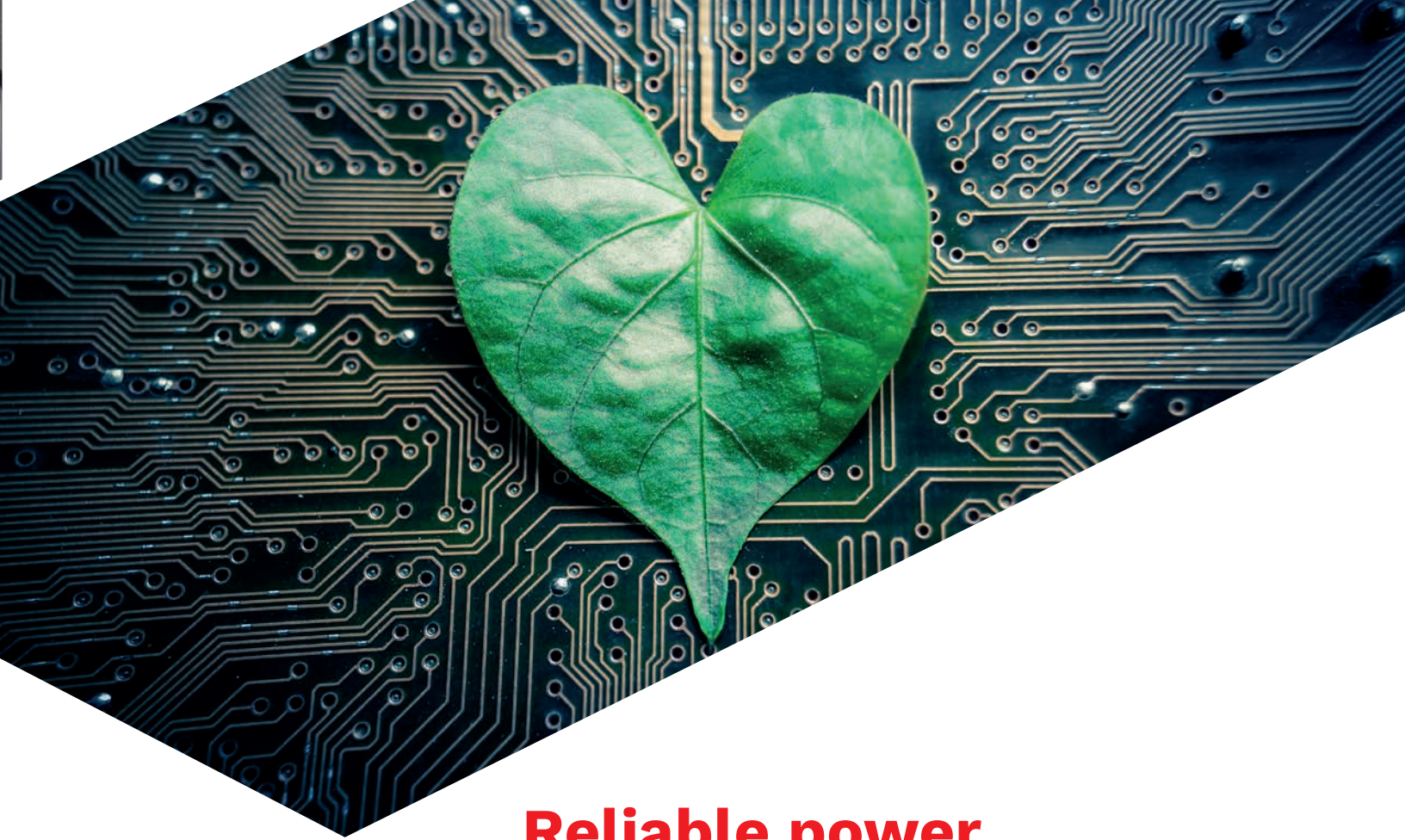
INNOVATION

the secret of an all-Italian success story

Riello UPS offers a diverse choice of products organized into 23 ranges of uninterruptible power supplies (UPS) incorporating several different state-of-the-art technological architectures. Thanks to its two research centers in Legnago (Verona) and Cormano (Milan), world class centers of excellence for the design, development and testing of uninterruptible power supplies, Riello UPS constantly innovates its product portfolio, keeping it at the pinnacle of performance, reliability and competition. In addition, in the event of large tenders or commissions Riello

UPS often provides bespoke solutions based on the specifications provided, demonstrating its attention to the customer's individual requirements. Riello UPS designs and manufactures its UPS in Italy in order to maintain direct control over quality and reliability standards, in addition to control over the entire manufacturing, sales and after-sales service processes. This customer-centric strategy encourages continuous improvement by monitoring customer feedback and using it to make rapid adjustments to optimise features as required by

the market. This process further consolidates Riello UPS's reputation as a reliable, dynamic and quality-oriented company. It doesn't stop here however: the successful development of innovative and modern UPS solutions such as Modular UPS and Smart Grid Ready UPS (i.e. ready for intelligent power distribution grids which represent the future of energy supply), are clear proof that innovation and quality are the secrets of Riello UPS's success.



Reliable power for a sustainable world

Energy and sustainability in one hand

“Reliable power for a sustainable world” is the Riello UPS philosophy condensed into few simple words; a global brand constantly searching for the most innovative solutions that ensure a dual safety: a solid critical-load protection that also keeps the protection and sustainability of Planet Earth at the forefront of our minds.

Riello UPS manufactures efficient solutions that ensure power quality and business continuity. The company constantly implements new ideas and technologies to increase the efficiency of its products and reduce their power consumption and environmental impact. To this end, the company also invests significantly in new technologies that harvest clean and renewable energy

sources. Riello UPS's social commitment aims to help the present as well as shape a bright, sustainable future, combining the inevitable need for energy with environmental protection:

- Riello UPS has always been a strong supporter of the Code of Conduct (CoC) on Energy Efficiency and Quality of AC Uninterruptible Power Systems, a document addressed to the European Commission by all the major European manufacturers of UPS.
- It sets out energy efficiency targets for power ranges from 300 VA to above 200 kVA, from 25% to 100% loads. Riello UPS was the first European Manufacturer to classify its products in terms of ECO energy efficiency ratings.

- Riello UPS pays close attention to the use of low environmental impact materials from the initial design and development stage through to the final release of its products into the market.
- Riello UPS employs an environmental management system that is ISO 14001 certified.
- Huge attention is given to the evolution of the electric grid, in particular to the use of renewable energy sources: the Riello UPS offer incorporates not only traditional and Smart Grid Ready UPS, but also photovoltaic inverters and energy storage systems.

THE ROLE OF THE UPS IN MODERN ELECTRICAL POWER GRIDS: SMART GRID READY UPS

The ongoing evolution of electrical power grids is a key element for achieving greater sustainability. Smart Grids are fundamental to this: power management systems that balance supply with demand by using energy in the most efficient way.

In essence, Smart Grids are nothing more than power grids that integrate and manage the behaviour and actions of all connected consumers, generators, and output points with the aim of delivering an economically viable, safe, secure, and quality electrical system. Smart Grids enable the integration of different energy sources, encourage two-way flows electricity and information, and allow for centralised management. Smart Grids also introduce new business opportunities for installations of UPS. Uninterruptible power supply batteries represent a significant financial investment, but they are only partially

used. In the new Smart Grid scenario, installations with UPS can take on new roles by becoming virtual power plants. Its batteries harness the power of renewable energy sources like solar or wind and store energy that can be fed back into the grid.

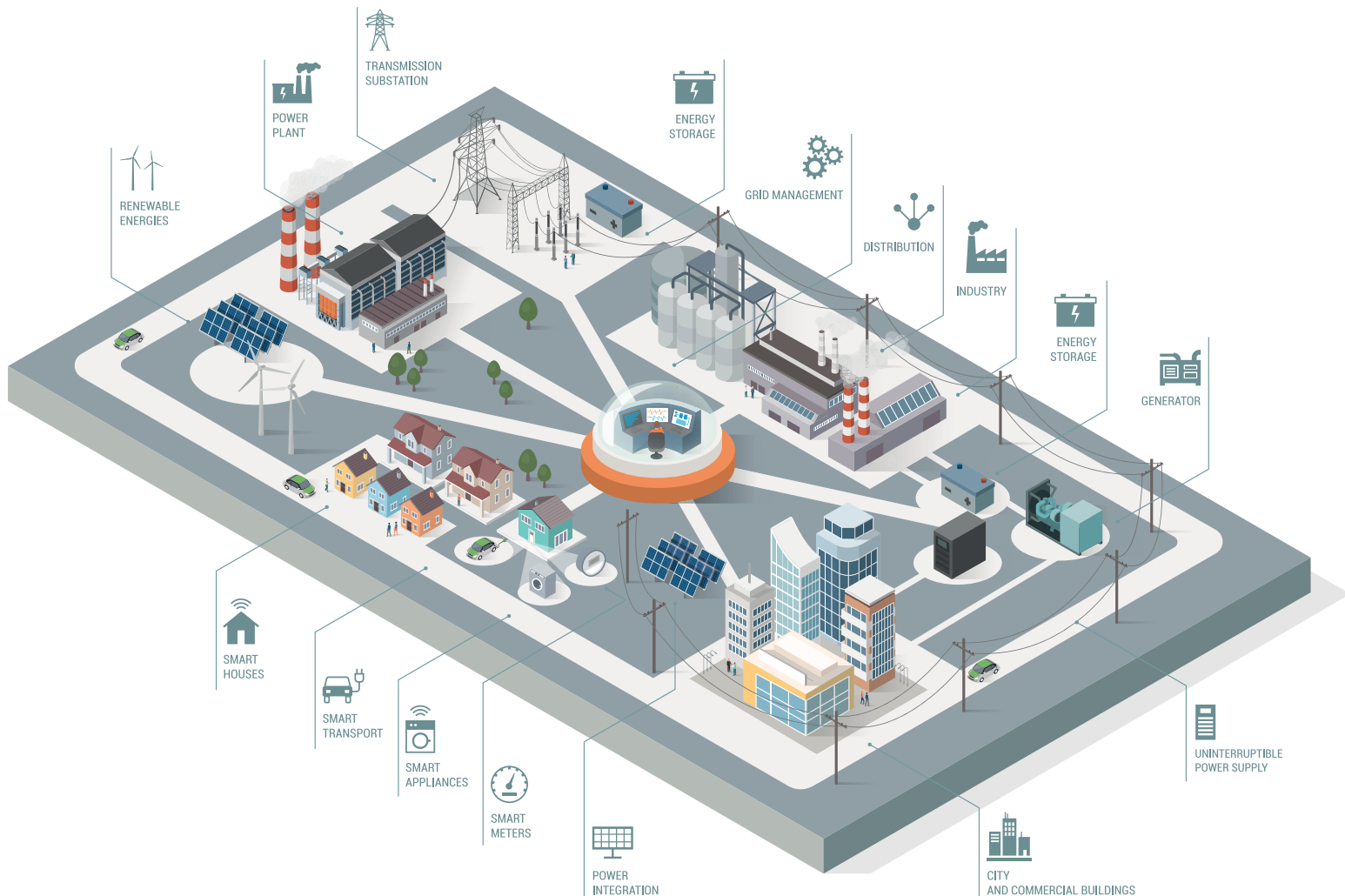
In order to be "Smart Grid Ready", a UPS must deliver extremely high levels of efficiency and be able to independently select the most efficient operating method depending on the real-time status of the grid.

It must also be able to electronically interface with the energy manager across the Smart Grid communication network. Always at the forefront of technological innovation, Riello UPS has invested significant R&D to develop Smart Grid Ready products such as the Master HP UL range.

With almost a decade of innovation and experience in the Smart Grid field,

Riello UPS is also involved in high-profile projects such as a trans-European project with RWE Supply & Trading: Master+ is a solution that enables mission-critical facilities like data centers or hospitals to profit from the batteries in their uninterruptible power systems by commercialising idle energy storage capacity through the energy market, minimising capital expenditure and operating costs while enhancing system reliability.

These are just two of the countless examples of how Riello UPS and its technological innovations is redefining the role of the UPS and opening up new business opportunities.





THE HUMAN FACTOR, ADDED VALUE

The concepts of product quality and excellence are central to Riello UPS's corporate philosophy, but this is complemented with a further concept: the value of people, whether they are customers, users or colleagues. At every staff level in Riello UPS, the sense of belonging to the company and respect for others creates an excellent working environment, which is instrumental in achieving consistently exceptional results. The teamwork that leads everyone to give their best every day, collaborating with colleagues to achieve challenging objectives is the result of

the careful selection, management and training of staff and above all due to a healthy attitude of sharing targets at all levels and an ethical belief in added value.

One of the secrets of Riello UPS's success is the reciprocal respect for each person's contributions and the collective effort to ensure the best levels of service and customer satisfaction. The countless awards we receive are proof of this, such as the accolade from Frost & Sullivan.



Options and accessories compatibility table

Easily identify the UPS that supports the software and accessories your installation requires.

UPS	Software		Specifications								
	POWERSHIELD ³ Shutdown software	POWERNETGUARD Inventory manager software	120 V 1/1	208 V 2/2	208 V 3/3	480 V 3/3	Manual bypass	Internal battery	Parallelable	Transformer-free	Transformer based
SENTINEL RT 1-3 kVA	●	●	●					●		●	
SENTINEL RT 6-10 kVA	●	●		●				●		●	
SENTRYUM S3U	●	●			●		Ⓐ	●	●	●	
MASTER HP UL	●	●				●	Ⓒ		●		●
MASTER HP FC UL	●	●				Ⓑ			●		●



Key		(A)	S3U SW
		(B)	480 V - 60 Hz/400 V - 50 Hz
		(C)	depending on the version
std			standard

Ports					Accessories					info
USB	RS232	Contacts	Slot	EPO	NETMAN 104 UL Card - Ethernet -SNMP v1,v3	NETMAN 204 UL Card - Ethernet -SNMP v1,v3	MULTICOM 384 UL Card - Relay I/O Interface	MULTICOM 392 UL Card - relay 3 In/8 Out	I/O RELAY CARD Expansion board	UPS page
●	●	-	1	●	●					
●	●	-	1	●	●					
●	●	std	2	●		●	●	●		
	●	std	2	●		●			●	
	●	std	2	●		●			●	38







UPS for North America (UL/CSA standards)



SOHO



INDUSTRY



EMERGENCY



E-MEDICAL

Sentinel RT

USB
plugPlug & Play
installation

TowerRack



True-ON LINE UPS System

1:1 1-3 kVA/kW

HIGHLIGHTS

- **Power factor
1 kW = kVA**
- **Simplified installation**
- **High quality output
voltage**
- **High battery reliability**

SENTINEL RT is designed to power critical loads such as servers, storage systems, telephone equipment, medical systems and industrial applications.

The UPS is ideal for Blade servers with an input power factor close to Unity (1). The UPS has can be used as tower UPS or within a rackmount cabinet, and takes up only 2U in height.

SENTINEL RT has a modern design, choice of functional formats, and represents the state-of-the-art technology from the Riello UPS research & development team. The UPS can achieve an ON LINE operating efficiency of 92%. For critical business continuity applications requiring long runtimes, SENTINEL RT can be installed with battery extension packs.

The UPS also incorporates the Riello UPS

'power-off' function found in other ECO Line UPS. SENTINEL RT is designed to save energy when no loads are connected.

SIMPLIFIED INSTALLATION

Tower or Rackmount UPS: SENTINEL RT can be installed as tower or 19" rack mount UPS, with a front mimic panel that can be turned through 90° to suit the installation.

- Noise Free Operation (<40dBA): the UPS can be installed in any environment thanks to its PWM digitally-controlled high frequency inverter;
- High Temperature Operation: UPS components are sized for high temperature operation up to 104 °F (40 °C) and are not therefore stressed during normal operational environments.



REDUCED MANAGEMENT COSTS

SENTINEL RT can be programmed remotely via software or set manually from the front mimic panel to operate in a range of energy saving operating modes:

- ON LINE: maximum power protection and output voltage waveform quality (efficiency up to 92%);
- ECO Mode: to increase efficiency (up to 98%), allows for the selection of LINE INTERACTIVE technology (VI) to power low priority loads from the mains supply;
- SMART ACTIVE: the UPS automatically decides upon the operating mode (VI or VFI) based on the quality of the mains power supply;
- STANDBY OFF: the operating mode in which the UPS functions as an emergency device. While power is present the UPS does not intervene. In the event of a blackout, the necessary power is provided by the UPS.

HIGH QUALITY OUTPUT VOLTAGE

- Even with non-linear loads (IT loads with a crest factor of up to 3:1);
- High short circuit current on bypass;
- High overload capacity: 150% by inverter (even with mains failure);
- Filtered, stabilised and reliable voltage (TRUE-ON LINE double conversion technology), with filters for the suppression of atmospheric disturbances;
- Power factor correction: UPS input power factor close to 1 and sinusoidal current uptake.

HIGH LEVELS OF BATTERY RELIABILITY

- Automatic and manual battery tests;
- Batteries are 'hot-swappable' and user replaceable.

EMERGENCY FUNCTION

This configuration ensures the operation of those emergency systems that require continuous, reliable and long-lasting power supply in the event of a mains power failure, such as emergency lighting, fire detection/ extinguishing systems and alarms.

When the mains power supply fails, the inverter begins powering the loads with a progressive start up (Soft Start) in order to prevent overload.

OTHER FEATURES

- Output voltage can be selected using display;
- Auto-restart when mains power returns (programmed via software);
- Standby on Bypass: when the machine is switched off, it automatically goes into bypass operation with batteries charging;
- Power-Off with zero load connected to save energy;
- Low battery warning;
- Power-on delay;
- Full microprocessor control;
- Automatic bypass without interruption;
- Status, measurements and alarms available on the front panel mimic panel and LCD;
- UPS firmware upgrade via PC;
- Input protection including a user reset thermal switch (up to 1500VA);
- Back-feed protection;
- Manual option to switch to bypass.

ADVANCED COMMUNICATIONS

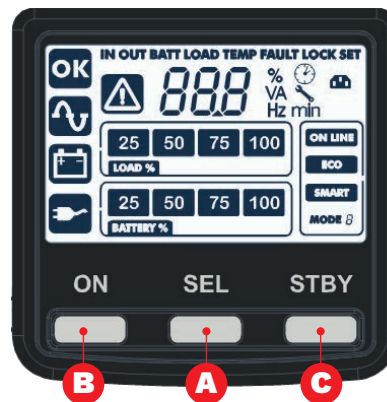
SENTINEL RT offers maximum flexibility for integrations with any communication system.

- Multiplatform communication for all operating systems and network environments, Powershield³ supervision and shut-down software for Windows, Mac OS X operating systems and other Unix operating systems;
- RS232 serial port and opto-isolated contacts;
- USB port;
- Slot for TCP/IP, SNMP communication card.

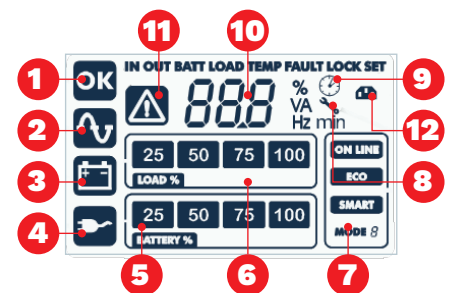
UNITY POWER FACTOR

- More power delivered;
- More real output power (W).

2-YEAR WARRANTY



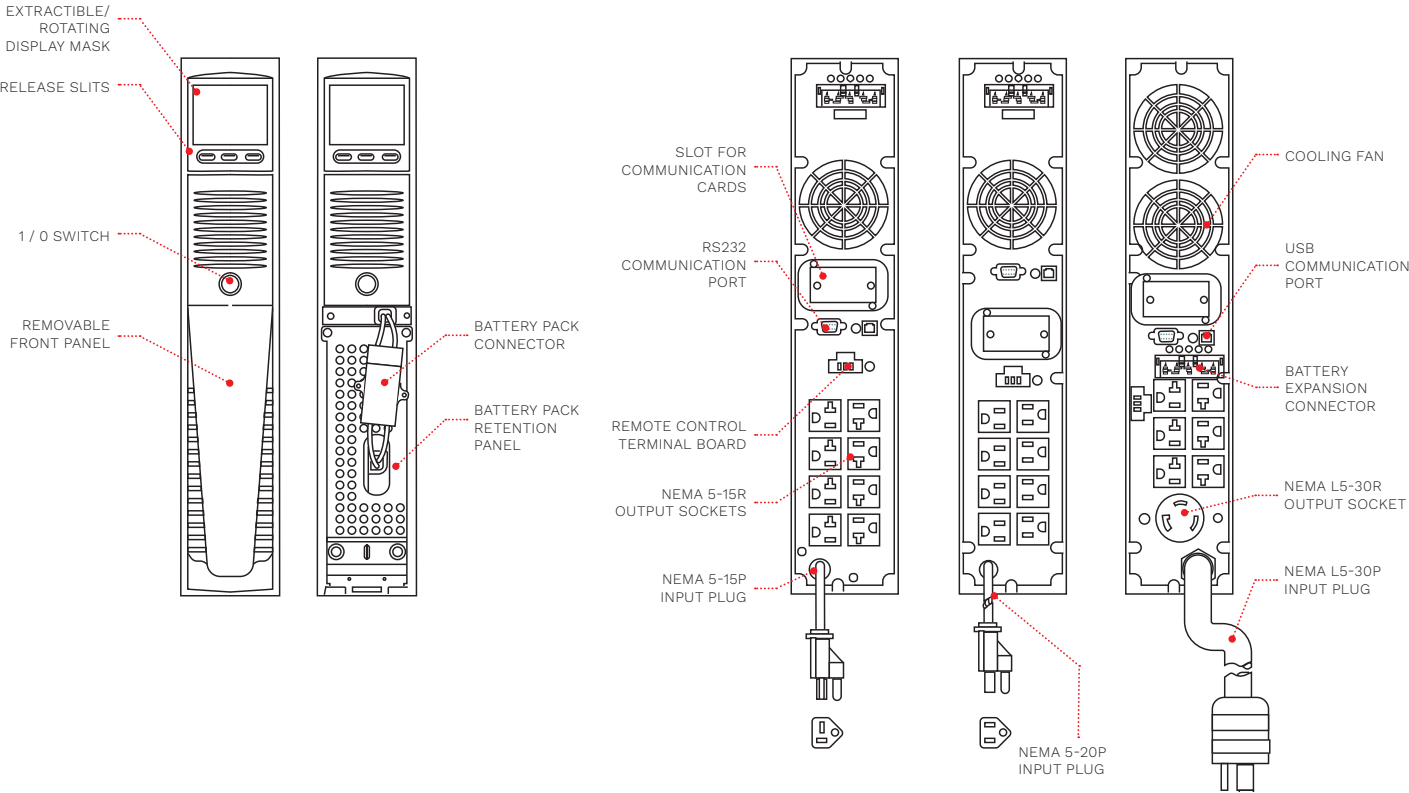
- A.** "SEL" Button
- B.** "ON" Button
- C.** "STANDBY" Button



- 1.** Regular operating mode
- 2.** Network operating mode
- 3.** Battery operating mode
- 4.** Load powered by bypass
- 5.** Battery charge level indicator
- 6.** Load level indicator
- 7.** Configuration area
- 8.** Maintenance required indicator
- 9.** Timer indicator
- 10.** Measurement display area
- 11.** Standby / alarm indicator
- 12.** EnergyShare indicator

Front view

Rear view



MODELS	SDH 1000 RT	SDH 1500 RT	SDH 2000 RT	SDH 3000 RT
INPUT				
Rated power [VA]	1000	1500	2000	3000
Rated voltage [V]	100 / 110 / 115 / 120 / 127			
Voltage tolerance [V]	80 <Vin <150 @ 100% Load			
Frequency [Hz]	60			
Frequency tolerance [Hz]	60 ±5%			
Power Factor	>0.98			
Current distortion	≤6%			
BYPASS				
Voltage tolerance [V]	85 / 140			
Frequency tolerance [Hz]	Frequency selected (from ±0 to ±5 configurable)			
Number phases	1			
OUTPUT				
Rated power [kVA]	1	1.5	2	3
Active power [kW]	1	1.5	2	3
Number phases	1			
Crest factor [Ipeak/Irms]	3:1			
Rated Voltage [V]	Selectable: 100 / 110 / 115 / 120 / 127			
Waveform	Sinewave			
Frequency [Hz]	Can be selected: 60 or self-learning			
Voltage distortion with non linear load	≤4%			
Voltage distortion with linear load	≤2%			
OVERLOAD TIMES				
100% <Load <110%	1 min			
125% = Load <150%	4 sec.			
Load >150%	0.5 sec.			
BATTERIES				
Type	VRLA AGM lead, maintenance-free			
Typical recharge time	2-4 h			
DC Voltage	36VDC		72VDC	
ENVIRONMENTAL				
Maximum altitude [ft/m]	20000 / 6000			
Color	Black			
Communications	USB / DB9 with RS232 and contacts / Slot for communication interface			
Safety compliance	UL1778:2014 and CSA C22.2 No. 107.3-14			
EMC conformance	CFR 47 FCC Part 15, Subpart B, Class A 2016			
Accessories provided	Power cable, serial cable, USB cable, safety manual, quick start, software downloadable			
Protection rating	IP20			
Surge capability [joule]	300			
Certification	Certified by TUV per UL 1778			
LINE-INTERACTIVE/SMART ACTIVE efficiency	98%			
Noise Level	<40 dB(A) at 3.3 ft / 1 m			
Operating temperature	32 – 104 °F / 0 – 40 °C			
Relative humidity	<95% without condensation			
OTHER				
Net Weight [lbs/kg]	37.48 / 17	39.68 / 18	58.42 / 26.5	69.44 / 31.5
Gross weight [lbs/kg]	45.19 / 20.5	47.40 / 21.5	67.24 / 30.5	79.36 / 36
Dimensions (WxDxH) [inches/mm]	3.42x16.73x17.71 / 87x425x450		3.42x24.60x17.71 / 87x625x450	



SOHO



INDUSTRY



EMERGENCY



E-MEDICAL

Sentinel RT

USB
plugPlug & Play
installation

TowerRack



True-ON LINE Rack/Tower UPS System 1:1 6-10 kVA/kW



HIGHLIGHTS

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1 kW = kVA**
- **Simplified installation**
- **High quality output
voltage**
- **High battery reliability**

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- High Temperature Operation: UPS components are sized for high temperature operation up to 104 °F (40 °C) and are not therefore stressed during normal operational environments.

REDUCED MANAGEMENT COSTS

SENTINEL RT can be programmed remotely via software or set manually from the front mimic panel to operate in a range of energy saving operating modes:

- ON LINE: maximum power protection and output voltage waveform quality (efficiency up to 92%);
- ECO Mode: to increase efficiency (up to 98%), allows for the selection of Line Interactive technology (VI) to power low priority loads from the mains supply;
- SMART ACTIVE: the UPS automatically decides upon the operating mode (VI or VFI) based on the quality of the mains power supply;
- STANDBY OFF: the operating mode in which the UPS functions as an emergency device. While power is present the UPS does not intervene. In the event of a blackout, the necessary power is provided by the UPS.

HIGH QUALITY OUTPUT VOLTAGE

- Even with non-linear loads (IT loads with a crest factor of up to 3:1);
- High short circuit current on bypass;
- High overload capacity: 150% by inverter (even with mains failure);
- Filtered, stabilised and reliable voltage (TRUE-ON LINE double conversion technology), with filters for the suppression of atmospheric disturbances;
- Power factor correction: UPS input power factor close to 1 and sinusoidal current uptake.

HIGH LEVELS OF BATTERY RELIABILITY

Automatic and manual battery tests. Batteries are 'hot-swappable' and user replaceable.

EMERGENCY FUNCTION

This configuration ensures the operation of those emergency systems that require continuous, reliable and long-lasting power supply in the event of a mains power failure, such as emergency lighting, fire detection/ extinguishing systems and alarms.

When the mains power supply fails, the inverter begins powering the loads with a progressive start up (Soft Start) in order to prevent overload.

OTHER FEATURES

- Output voltage can be selected using display;
- Auto-restart when mains power returns (programmed via software);
- Standby on Bypass: when the machine is switched off, it automatically goes into bypass operation with batteries charging;
- Power-Off with zero load connected to save energy;
- Low battery warning;
- Power-on delay;
- Full microprocessor control;
- Automatic bypass without interruption;
- Status, measurements and alarms available on the front panel mimic panel and LCD;
- UPS firmware upgrade via PC;
- Back-feed protection;
- Manual option to switch to bypass;
- Isolation transformer cabinet.

ADVANCED COMMUNICATIONS

SENTINEL RT offers maximum flexibility for integrations with any communication system.

- Multiplatform communication for all operating systems and network environments, Powershield³ supervision and shut-down software for Windows, Mac OS X operating systems and other Unix operating systems;
- RS232 serial port and opto-isolated contacts;
- USB port;
- Slot for TCP/IP, SNMP communication card.

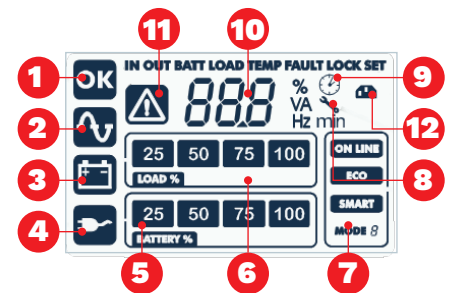
UNITY POWER FACTOR

- More power delivered;
- More real output power (W).

2-YEAR WARRANTY



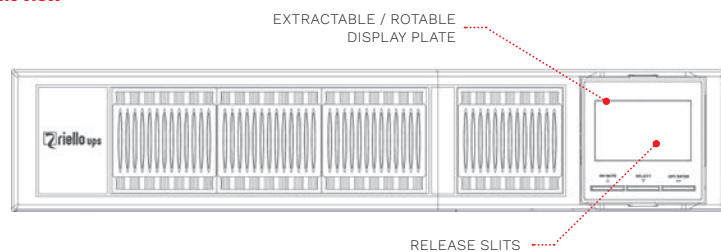
- A.** "SEL" Button
- B.** "ON" Button
- C.** "STANDBY" Button



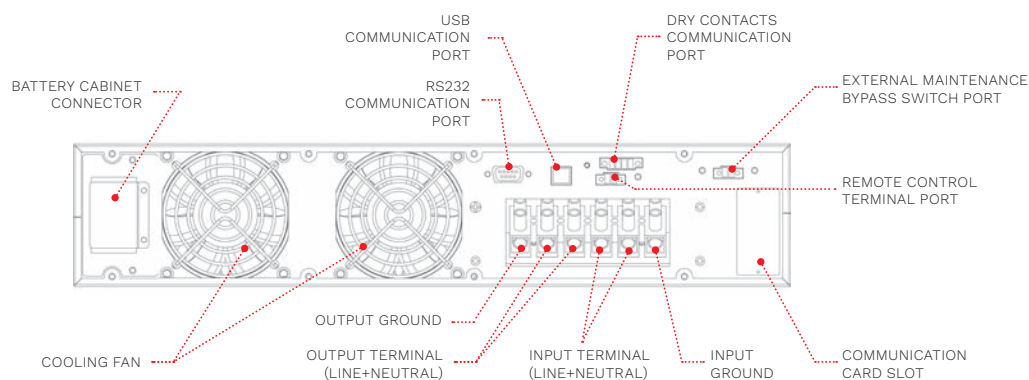
- 1.** Regular operating mode
- 2.** Network operating mode
- 3.** Battery operating mode
- 4.** Load powered by bypass
- 5.** Battery charge level indicator
- 6.** Load level indicator
- 7.** Configuration area
- 8.** Maintenance required indicator
- 9.** Timer indicator
- 10.** Measurement display area
- 11.** Standby / alarm indicator
- 12.** EnergyShare indicator

DETAILS

Front view



Rear view



MODEL	UPS Cabinet	Battery Cabinet QTY	Transformer cabinet for 120V/127V output	Dimensions (in tower configuration) W x D x H (in/mm)	Weight (lb/kg)
SDH-6000-RT-ER-C0	Yes	0	Yes	9(5U)x25x19 / 218(5U)x438x645	181 / 82
SDH-10000-RT-ER-C0	Yes	0	Yes	9(5U)x25x19 / 218(5U)x438x725	249 / 113
SDH-6000-RT-ER-C1	Yes	1	Yes	14(8U)x26x19 / 349(8U)x438x645	302 / 137
SDH-10000-RT-ER-C1	Yes	1	Yes	14(8U)x29x19 / 349(8U)x438x725	370 / 167
SDH-6000-RT-ER-C2	Yes	2	Yes	19(11U)x26x19 / 480(11U)x438x645	423 / 191
SDH-10000-RT-ER-C2	Yes	2	Yes	19(11U)x29x19 / 480(11U)x438x725	492 / 223
SDH-6000-RT-ER-C3	Yes	3	Yes	25(14U)x26x19 / 611(14U)x438x645	545 / 247
SDH-10000-RT-ER-C3	Yes	3	Yes	25(14U)x29x19 / 611(14U)x438x725	613 / 278
SDH-6000-RT-ER-C4	Yes	4	Yes	30(17U)x26x19 742(17U)x438x645	666 / 302
SDH-10000-RT-ER-C4	Yes	4	Yes	30(17U)x29x19 747(17U)x438x725	734 / 333

MODELS	SDH 6000 RT	SDH 10000 RT
INPUT		
Rated Power [VA]	6000	10000
Rated voltage [V]	208 / 220 / 230 / 240	
Voltage tolerance [V]	110 <Vin <300 @ 60% LOAD / 176 <Vin <300 @ 100% Load	
Frequency [Hz]	50 / 60	
Frequency tolerance [Hz]	60 ±5%	
Power Factor	>0.98	
Current distortion	≤6%	
BYPASS		
Voltage tolerance [V]	176 / 276	
Frequency tolerance [Hz]	Frequency selected (from ±0 to ±5 configurable)	
Number phases	1	
OUTPUT		
Rated power [kVA]	6	10
Active Power [kW]	6	10
Voltage [V] option UPS	208 / 220 / 230 / 240	
Voltage [V] option with transformer cabinet	240 plus neutral for a split of 120 / 120 or 230 plus neutral for a split 115 / 115	
Number phases	1	
Crest factor [Ipeak/Irms]	3:1	
Waveform	Sinewave	
Frequency [Hz]	Can be selected: 60 or self-learning	
Voltage distortion with non linear load	≤4%	
Voltage distortion with linear load	≤2%	
OVERLOAD TIMES		
100% <Load <110%	10 min.	
125% = Load <150%/130%	1 min.	
Load >150%/130%	1 min.	
BATTERIES		
Type	VRLA AGM lead, maintenance-free	
Typical recharge time	6 h	
DC Voltage	240 VDC	
ENVIRONMENTAL		
Maximum altitude [ft/m]	20000 / 6000	
Color	Black	
Communications	USB / DB9 with RS232 and contacts / Slot for communication interface	
Safety compliance	UL1778:2014 and CSA C22.2 No. 107.3-14	
EMC conformance	CFR 47 FCC Part 15, Subpart B, Class A 2016	
Accessories provided	Power cable, serial cable, USB cable, safety manual, quick start, software downloadable	
Protection rating	IP20	
Surge capability [joule]	660	
Certification	Certified by TUV per UL 1778	
LINE-INTERACTIVE/SMART ACTIVE efficiency	98%	
Noise Level	<40 dB(A) at 3.3 ft / 1 m	
Operating temperature	32 – 104 °F / 0 – 40 °C	
Relative humidity	<95% without condensation	
OTHER		
Weight [lbs/kg]	37.47 / 17	44 / 20
Dimensions (WxDxH) [inches/mm]	3.4x17.24x24 / 87x438x610	



EMERGENCY



E-MEDICAL



INDUSTRY



DATACENTER



TRANSPORT

Sentryum S3U



ONLINE



Tower

USB
plugService
1st start

sentryum

3:3 10-20-30 kVA
208V, 60 Hz

HIGHLIGHTS

- **Efficiency up to 95.5%**
- **High power availability**
- **Outstanding battery care**
- **Compact**
- **Maximum reliability**
- **Flexibility of use**
- **Graphic touch screen display**

The rapid evolution of IT technologies, augmented focus on environmental matters and complexity of critical applications are demanding more flexible, efficient, secure and interconnected power protection solutions. The Sentryum 10-30 kVA @ 208 V offers the best combination of power availability, energy efficiency and global performance ensuring installation and running cost savings. It is the very latest Riello UPS development resulting in a third-generation transformer-free UPS, originally introduced into the market over twenty years ago.

The Sentryum series is a transformer-free UPS available in 10-20-30 KVA with three-phase input and output. Sentryum is designed and built using state-of-the-art technology and components. It applies the

advanced technologies such as DSP (Digital Signal Processor), dual core microprocessor, three-level inverter circuits and resonant control to provide maximum protection to the critical loads with no impact on downstream systems, whilst maintaining optimised energy savings. With a unique control system, it makes it possible to reduce the inverter output harmonic voltage distortion and provide rapid response to all load variations, ensuring an outstanding sinewave form during all conditions. Furthermore, Riello UPS' technological advances in digital control and power components contribute to minimise the impact on the grid. Sentryum provides the solution to installation problems in systems where the power supply has limited power available, when the UPS is supported by a

generator or where there are compatibility problems with loads that generate harmonic currents.

EXTENSIVE RANGE OF SOLUTIONS

Sentryum has been conceived to optimise the specific requirements by enhancing the installation flexibility. Riello UPS offers Sentryum in two different frame solutions the S3U model with only one switch and the S3U SW with four switches.

COMPACT

Modern guidelines and sustainable best practices direct us to conceive and design UPS with particular focus on the entire product life cycle, therefore applying ultimate but resilient technologies, recyclable materials and miniaturisation of assemblies whilst ensuring the systems global reliability, which is pivotal for any UPS.

HIGH EFFICIENCY

Sentryum is a true ON LINE double-conversion UPS system providing the very highest levels of power availability, flexibility and unrivalled energy efficiency with superior performance for any small Data Center and mission critical applications. Thanks to the three-level IGBT inverter topology (constructed using modules rather than discrete components) and innovative digital control, the Sentryum provides up to 95.5% overall efficiency, whilst maintaining a reduced number of components, connections and ribbon cables, which increases the overall system reliability, thanks to a higher MTBF. Riello UPS' advanced average current mode digital PFC control and State-of-the-art three-level NPC inverters working at high frequency (18 kHz), contributes to minimise the UPS's impact on the grid and hence reducing the overall operational costs and energy bills. Sentryum applies a zero impact onto its power source, whether this is from the mains power supply or a generator, this results in:

- very low input current distortion <3%;
- near unity input power factor 0.99;
- power walk-in function that ensures progressive rectifier start up;
- start up delay function, to sequentially restart the rectifiers once the mains power supply is restored if there are several UPS within the overall system;
- Sentryum provides a filtering and power factor correction function within the power network upstream of the UPS.

HIGH POWER AVAILABILITY

Sentryum's design delivers full power up to 40 °C ambient temperature. Furthermore, Sentryum's advanced digital control makes it possible to deliver up 270% inverter current for 200 msec. and 150% for 300 msec. The high overcurrent availability 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. The innovative input stage design provides extremely high battery recharging current whilst at the same time an energy efficient conversion process during battery operation to reduce the power wasted and to increase the autonomy time compared to legacy DC/AC converters.

SMART BATTERY MANAGEMENT

Proper battery care is critical to ensure the correct operation of the UPS during emergency conditions. The Riello UPS Smart Battery Management (SBM) consists of a series of features and capabilities to optimise battery management and obtain the best performance and operating life possible. Battery recharging: Sentryum is suitable for use with conventional hermetically sealed lead-acid (VRLA), AGM and GEL batteries, Open Vent and Nickel Cadmium batteries. Superior battery charging availability up to 25 A for all models, meaning that the Sentryum can be utilized within any extended battery autonomy application.

Depending on the battery type, different charging methods are available:

- One-level voltage recharge, typically used for widely available VRLA AGM batteries;
- Two-level voltage recharge according to IU specification;
- Cyclical recharge system to reduce electrolyte consumption and lengthen the life of VRLA batteries.

Recharge voltage compensation based on ambient temperature to prevent excessive battery charging or overheating.

Battery tests to diagnose in advance any reduction in performance or problems with the batteries.

Deep discharge protection: during extended low-load discharges, the end-of-discharge voltage is increased - as recommended by battery manufacturers - to prevent damage or reduced battery performance.

Ripple current: recharge ripple current (residual AC component at low frequency) is one of the main causes of reduced reliability and battery life. Using a high frequency battery charger, Sentryum reduces this value to negligible levels, prolonging battery life and maintaining high performance over a long period of time.

Wide voltage range: the rectifier is designed to operate within a wide input voltage range (up to -40% at half load), reducing the need for battery discharge and thus helping to extend battery life.



Graphic touch screen display

MAXIMUM RELIABILITY AND AVAILABILITY

Distributed parallel configuration of up to 8 units per redundant (N+1) or power parallel system. The UPS continue to operate in parallel even if the connection cable is interrupted (Closed Loop).

Advanced technology and use of high performance components, allows Sentryum to provide exceptional performance and efficiency from a very compact size:

- The smallest overall footprint is only 0.45 sqm for Sentryum 30 kVA/kW with 8 minutes back-up time;
- The input power stage (IGBT rectifier) ensures an input power factor close to 1 with extremely low current distortion, avoiding the need for bulky and expensive filters;
- Extremely low output THDV under any circumstances provides a perfect sinewave and therefore a reliable power supply for the load preventing and disturbances from affecting the network users;
- More energy to face sudden load increase like for example 110% for 60 minutes or 125% for 10 minutes or clear output short circuits due to appliance failures downstream;
- Smart ventilation principle, Sentryum manages the fan speed and airflow in accordance with the room temperature and load level. This preserves the lifespan of the fans, whilst at the same time reduces noise levels and the overall power consumption

due to unnecessary UPS ventilation.

Furthermore, the overall UPS high efficiency reduces the losses and therefore the need for high levels of ventilation compared to older legacy UPS. In addition, this results in a decrease in the overall noise level at the nominal load and a reduction in the number of fans required, which significantly benefits the operating and maintenance costs.

FLEXIBILITY

With its flexible range of two solutions, configuration, performance, accessories and options, Sentryum is suitable for use in a wide range of applications:

- Two modules with or without switches for better matching the customer requirements;
- ON LINE, ECO, SMART ACTIVE and STANDBY OFF operating modes.
- Frequency converter mode;
- Cold Start to switch on the UPS even when there is no mains power present;
- Parallel configuration up to 8 units;
- Optional temperature sensor for external battery cabinets, to assist recharge voltage compensation;
- High power battery chargers to optimise charge time in the event of long runtimes;
- Dual input mains power supply;
- Different sized battery cabinets and capacities, for extended runtimes.

ADVANCED COMMUNICATIONS

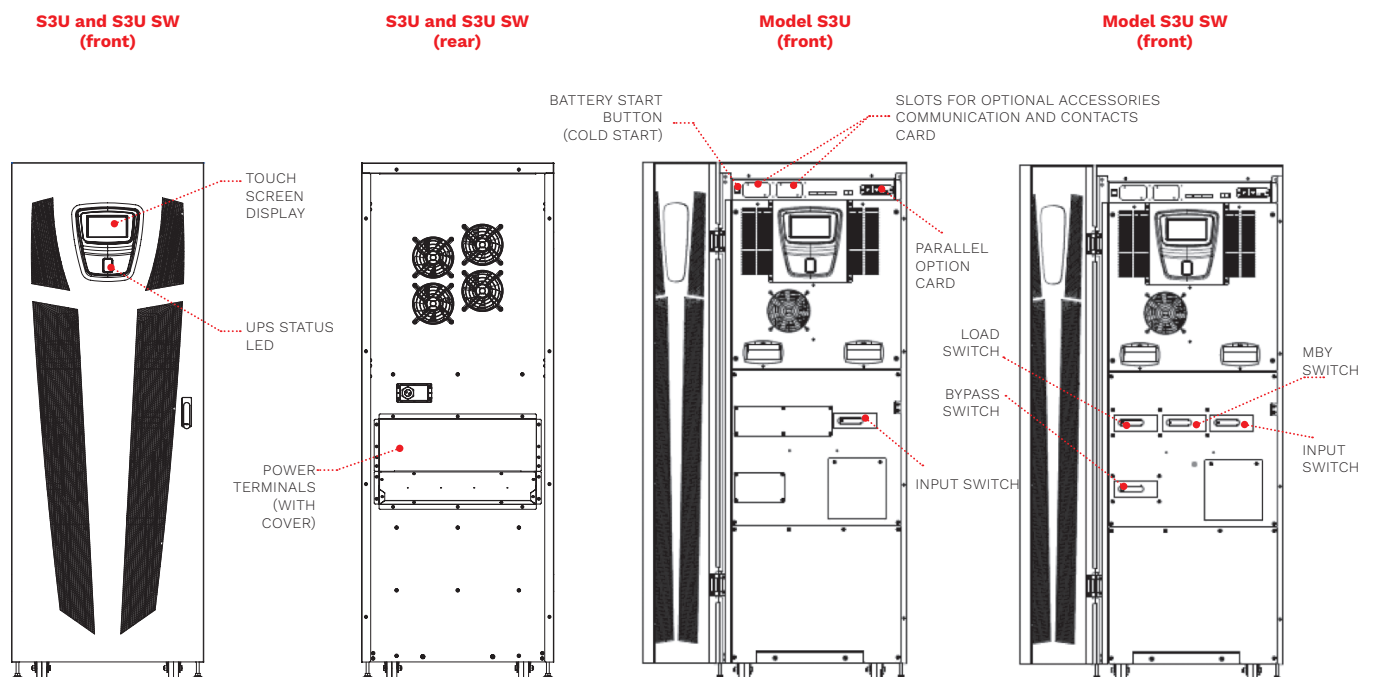
Sentryum is equipped with a coloured graphic touch screen display providing UPS information, measurements, operating states and alarms in different languages.

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 (blue, yellow and red) according with the operating mode and condition.

- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ monitoring and shutdown software included for Windows operating systems 10, 8, 7;
- RS232 serial on RJ10 connector and USB ports;
- 2 slots for the installation of optional communications accessories such as network adaptors and volt free contacts etc.;
- Embedded contact interface which includes 5 programmable inputs and 4 programmable outputs;
- REPO Remote Emergency Power Off for switching off the UPS via a remote emergency button.

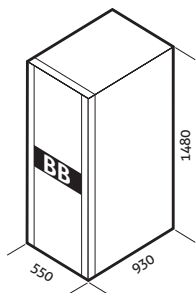
DETAILS



BATTERY CABINET

MODELS	BB 1500 240 – B1 / BB 1500 240 – N1
UPS MODELS	S3U 10-20-30/ S3 10-20-30 SW

Dimensions (mm)



OPTIONS

SOFTWARE
PowerShield ³
PowerNetGuard

ACCESSORIES
NETMAN 204
MULTICOM 384

PRODUCT ACCESSORIES
Versions with other operating voltages 208 V/480 V, 480 V/208 V, 480 V/480 V

MODELS	S3U 10	S3U 20	S3U 30
INPUT			
Rated voltage [V]	208 / 220 three-phase + N		
Voltage tolerance [V]	+15% -20% ¹		
Frequency tolerance [Hz]	45 to 65		
Power factor @ full load	0.99		
Current distortion [THDI]	≤3%		
BYPASS			
Rated voltage [V]	208 / 220 three-phase + N		
Voltage tolerance (Ph-N) [V]	5 to +15% (adjustable)		
Rated frequency [Hz]	60		
Frequency tolerance	±6% (selectable)		
Bypass overload	110% infinite, 125% for 60 min., 150% for 10 min., 200% for 1 min.		
OUTPUT			
Nominal power [kVA]	10	20	30
Active power [kW]	9	18	27
Power factor	0.9 up to up to 104 °F / 40 °C		
Rated voltage [V]	208 / 220 three-phase + N		
Nominal frequency [Hz]	60		
Frequency stability on battery operation	0.01%		
Voltage stability	±1%		
Dynamic stability	±3%		
Voltage distortion	≤1% wih ≤1.5% with non-linear load		
Overload	110% for 60 min., 125% for 10 min., 150% for 1 min.		
BATTERIES			
Type	VRLA AGM/GEL/NiCd		
Recharging method	One level, Two level, Cyclic recharge (selectable)		
OVERALL SPECIFICATIONS			
Weight without batteries [lb/kg]	324 / 147	324 / 147	340 / 154
Dimensions (WxDxH) [inches/mm]	21.7x32.7x59.0 / 550x830x1500		
Communications	UPS status led bar - Graphic touch screen diplay - 2 slots for communications interface USB - RS232 Contact interface with 5x opto insulated Input and 4x Output relay		
Operating temperature	32 – 104 °F / 0 – 40 °C		
Range of relative humidity	5-95% without condensing		
Colour	Pantone Black C		
Standards	UL 1778 5th Edition CSA C22.2 107.3 -05 and Annex NNN, UL 60950-11, FCC Part 15 Subpart J class A – IEC 62040-3		
Moving the UPS	Castors/pallet jack		

¹ Wider voltage tolerance acceptable with conditions applied.



EMERGENCY



E-MEDICAL



INDUSTRY



DATACENTER



TRANSPORT

Master HP UL



ONLINE



Tower



Service
1st start



SmartGrid
ready



3:3 65-500 kVA

HIGHLIGHTS

- **High efficiency**
- **IGBT-based rectifier technology**
- **Compact, reliable and robust**
- **Galvanic isolation**
- **High overload capacity**

The high levels of quality, reliability and energy savings offered by the Master HP range of UPS, has been extended to include a UL/CSA Listed, 480 V 60 Hz version with ratings from 65 kVA to 500 kVA. IT managers, facility managers, and CTOs are under increasing pressure to reduce downtime and assure that their critical loads are supplied with uninterrupted and high quality power. With this increasingly stringent requirement, Riello UPS has invested in power solutions that meet strict demands; a commitment resulting in the launch of the Master HP UL range. More than just an innovative and technologically-advanced UPS, it is a leap into the future of three-phase technology. With its double conversion ON LINE technology based entirely

on IGBT and digital signal processors (DSP), the Master HP UL range ensures maximum critical load protection, with VFI SS 111 classification (Voltage and Frequency Independent) in accordance with IEC EN 62040-3. This range is designed using a new configuration that includes an IGBT sinusoidal input rectifier. Unique in its design, double conversion technology with galvanic isolated output guarantees a quality power supply that is completely protected from all electrical anomalies at the input.

COMPLETE GALVANIC SEPARATION

The Master HP UL UPS features an output isolation transformer on the inverter as part

of the inverter circuit inside the UPS cabinet, providing galvanic isolation between the load and the battery with improved versatility in system configuration, allowing:

- Complete UPS output galvanic isolation for critical infrastructures from the battery DC power source;
- Two truly separated supply inputs (utility and bypass), which can be taken from two different power sources (with different neutrals); this is particularly well suited for parallel systems in order to ensure selectivity between the two sources, improving the reliability of the entire installation;
- No neutral input connection is required at the UPS rectifier input stage; this method is particularly favorable in order to prevent the transmission of common neutral disturbances via the neutral conductor;
- No effects to the UPS output performance or reduced impact of the inverter power components while supplying specific loads; in addition the inverter transformer minimizes the impact of third harmonic disturbances, prevents the effects of energy back-feed into the inverter when supplying industrial load applications and can supply unbalanced loads;
- High inverter short circuit current to clear faults which occur between phase and neutral on load side (up to three times nominal current).

Output transformer housed within a cabinet which allows for a significant reduction in the footprint and provides space savings.

ZERO IMPACT SOURCE

The Master HP UL series features the added advantages of the Zero Impact Source formula offered by an IGBT-based rectifier assembly. This eliminates problems connected with installation in networks with limited

power capacity, where the UPS is supplied by a generator set or anywhere there are compatibility problems with loads that generate current harmonics. Master MHT UL series UPS have zero impact on the power supply source, whether it is a utility grid or generator set:

- Input current distortion <3%;
- Input power factor 0.99;
- Power walk-in function that ensures progressive rectifier start up;
- Start up delay function, to restart the rectifiers when mains power is restored if there are several UPS in the system.

This provides savings in installation costs via:

- A smaller electrical infrastructure;
- Smaller circuit protection devices;
- Less wiring.

FLEXIBILITY

Master HP UL is suitable for a wide range of applications including IT and the most demanding industrial environments and processes. With several operational configurations including ON LINE, ECO, SMART ACTIVE, STANDBY, Frequency Converter and Voltage Regulation. A broad range of accessories and options, complex configurations and system architectures can be achieved to guarantee maximum power availability and the option to add new UPS without interruption to site operations.

BATTERY CARE SYSTEM: MAXIMUM BATTERY CARE

Master HP UL series UPS include a range of features designed to prolong battery life and reduce usage by using different recharging methods; deep discharge protection, current limitation, and voltage compensation based on ambient temperature.

MAIN FEATURES

- Compact size: e.g.: only 2.330 square inches for the Master HP UL 500 kVA;
- Reduced weight for transformer based UPS;
- Double load protection, both electronic and galvanic, towards the battery.

The entire Master HP UL range is suitable for use in a wide range of applications. The Master HP can supply any type of load, e.g. servers, controls, lighting, capacitive, switch mode. Power supply reliability and availability are ensured for critical applications by distributed parallel configurations of up to 8 units, for redundant (N+1) or power parallel configurations.

ADVANCED SUPERVISION

The Master HP UPS has a front panel mounted graphic display providing UPS information, measurements, status updates and alarms in multiple languages, with waveform displays including voltage/current and providing a kWh reading that can be used to measure IT loads and calculate a Data Center PUE (Power Usage Effectiveness) ratio.

OPTIONS

SOFTWARE

PowerShield³

PowerNetGuard

ACCESSORIES

NETMAN 204 UL

Multi I/O (Relay Alarm card and generator Interface)

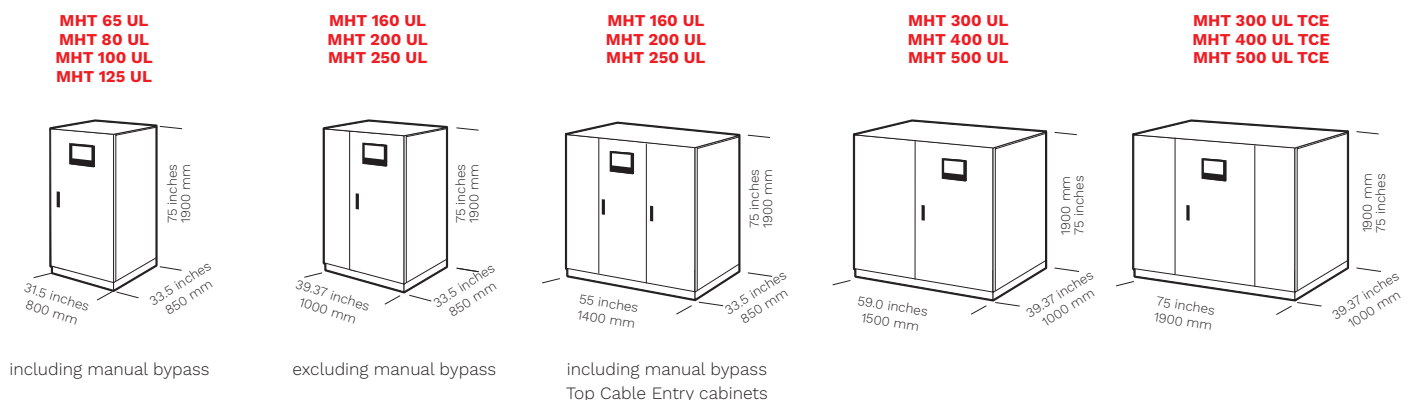
PRODUCT ACCESSORIES

Parallel configuration kit (Closed Loop)

Fully configured battery systems with appropriate autonomy

Maintenance Bypass Switchgear for all models

DIMENSIONS



MODELS	MHT 65 UL	MHT 80 UL	MHT 100 UL	MHT 125 UL	MHT 160 UL
INPUT					
Rated voltage [V]	480 three-phase + N				
Frequency [Hz]	45 / 65				
Power factor	>0.99				
Harmonic current distortion	<3% THDi				
Soft start	0 - 100% in 125" (selectable)				
Frequency tolerance	±2% (selectable from ±1% to ±5% from front panel)				
Standard equipment provided	Back Feed protection; separable bypass line				
BATTERIES					
Type	VRLA, Wet Cell, NiCd				
Ripple current	Zero				
Recharge voltage compensation	-0.061% x V x °F / -0.11% x V x °C				
OUTPUT					
Nominal power [kVA]	65	80	100	125	160
Active power [kW]	58.5	72	90	112.5	144
Number of phases	3 + N				
Rated voltage [V]	480 three-phase + N				
Static stability	±1%				
Dynamic stability	from ±5% to ±1% in 20 msec.				
Voltage distortion	<1% with linear load / <3% with non-linear load				
Crest factor [Ipeak/Irms]	3:1				
Frequency stability on battery	0.05%				
Frequency [Hz]	60				
Overload	110% for 60 min.; 125% for 10 min.; 150% for 1 min.				
INFO FOR INSTALLATION					
Weight [lbs/kg]	1500/680		1610/730	1742/790	1851/840
Weight with TCE and maintenance bypass [lbs/kg]	-	-	-	-	2204/1000
Dimensions (WxDxH) [inches/mm]	31.5x33.5x75 / 800x850x1900				39x33.5x75 / 1000x850x1900
Dimensions with TCE and Maintenance bypass (WxDxH) [inches/mm]	-	-	-	-	55x33.5x75 / 1400x850x1900
Remote signals	dry contacts (configurable)				
Remote controls	ESD and bypass (configurable)				
Communications	Double RS232 + dry contacts + 2 slots for communications interface with SNMP				
Operating temperature	32 – 104 °F / 0 – 40 °C				
Relative humidity	<95% non-condensing				
Color	Black				
Noise level at 3.3 ft / 1 m (ECO Mode) [dBA]	65			68	
IP rating	IP20				
ECO Mode efficiency	up to 98.5%				
Standards	UL Standard 1778: 2 nd edition from 65 to 125 kVA, 5 th edition from 160 to 250 kVA; From 160 to 250 kVA: UL 60950-1 1: Information Technology Equipment - Safety - Part 1: General Requirements; National Electrical Code (NFPA-70); FCC Part 15 Subpart J class A - Radio Frequency; IEC 62040-3; UL 924 and OUST category - Emergency Lighting and power equipment				
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111				
Transport	Pallet jack				

MODELS	MHT 200 UL	MHT 250 UL	MHT 300 UL	MHT 400 UL	MHT 500 UL
INPUT					
Rated voltage [V]	480 three-phase + N				
Frequency [Hz]	45 - 65				
Power factor	> 0.99				
Harmonic current distortion	<3% THDi				
Soft start	0 - 100% in 125" (selectable)				
Frequency tolerance	±2% (selectable from ±1% to ±5% from front panel)				
Standard equipment provided	Back Feed protection; separable bypass line				
BATTERIES					
Type	VRLA, Wet Cell, NiCd on Racks or Cabinet				
Ripple current	Zero				
Recharge voltage compensation	-0.061% x V x °F / -0.11% x V x °C				
OUTPUT					
Nominal power [kVA]	200	250	300	400	500
Active power [kW]	180	225	300	400	450
Number of phases	3 + N				
Rated voltage [V]	480 three-phase + N				
Static stability	±1%				
Dynamic stability	from ±5% to ±1% in 20 msec.				
Voltage distortion	<1% with linear load / <3% with non-linear load				
Crest factor [Ipeak/Irms]	3:1				
Frequency stability on battery	0.05%				
Frequency [Hz]	60				
Overload	110% for 60 min.; 125% for 10 min.; 150% for 1 min.				
INFO FOR INSTALLATION					
Weight [lbs/kg]	2138/970	2247/1110	4190/1900	4741/2150	4741/2150
Weight with TCE and maintenance bypass [lbs/kg]	2524/1145	2799/1270	4410/2000 ¹	4961/2250 ¹	4961/2250 ¹
Dimensions (WxDxH) [inches/mm]	39x33.5x75 / 1000x850x1900		59x39.5x75 / 1500x1000x1900		
Dimensions with TCE and manual bypass (WxDxH) [inches/mm]	55x33.5x75 / 1400x850x1900		75x39.5x75 / 1900x1000x1900 ¹		
Remote signals	dry contacts (configurable)				
Remote controls	ESD and bypass (configurable)				
Communications	Double RS232 + dry contacts + 2 slots for communications interface				
Operating temperature	32 – 104 °F / 0 – 40 °C				
Relative humidity	<95% non-condensing				
Color	Black				
Noise level at 3.3 ft / 1 m (ECO Mode) [dBA]	68		72		
IP rating	IP20				
ECO Mode efficiency	up to 98.5%				
Standards	UL Standard 1778: 5 th edition; UL 60950-1 1: Information Technology Equipment - Safety - Part 1: General Requirements; National Electrical Code (NFPA-70); FCC Part 15 Subpart J class A – Radio Frequency; IEC 62040-3; UL 924 and OUST category – Emergency Lighting and power equipment		UL Standard 1778: 5 th edition; National Electrical Code (NFPA-70); NEMA; CSA C22.2; ASME; FCC section 15 subsection J class A; IEC 62040-3;		
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111				
Transport	Pallet jack				

¹ Maintenance Bypass Switch – on option.



EMERGENCY



E-MEDICAL



INDUSTRY



DATACENTER



TRANSPORT

Master HP FC UL



ONLINE



Tower



Service
1st start



SmartGrid
ready



3:3 80-200 kVA

Voltage and Frequency Converter



HIGHLIGHTS

- **High efficiency**
- **IGBT-based rectifier technology**
- **Output voltage: 400V - 50 Hz**
- **Galvanic isolation**
- **High overload capacity**

The high levels of quality, reliability and energy savings offered by the Master HP range of UPS have been extended to include frequency converter 480 V - 60 Hz input /400 V - 50 Hz output certified as UL, with power ratings from 80 to 200 kVA. The typical application of such Frequency Converters is the power supply of the loads at 400 V, 50 Hz as for example imported from other countries. The FC units can work with or without battery. With its double conversion ON LINE technology based entirely on IGBT and digital signal processors (DSP), the Master HP FC UL range ensures maximum critical load protection, with VFI SS 111 classification (Voltage and Frequency Independent) in accordance with IEC EN 62040-3. This range is designed using a new configuration that

includes an IGBT sinusoidal input rectifier. Unique in its design, double conversion technology with galvanic isolated output guarantees a quality power supply that is completely protected from all electrical anomalies at the input.

COMPLETE GALVANIC SEPARATION

Master HP FC UL feature an output isolation transformer (delta zig/zag type) on the inverter as part of the inverter circuit inside the FC cabinet, providing galvanic isolation between the load and the battery with improved versatility in system configuration, allowing:

- Complete FC output galvanic isolation for critical infrastructures from the battery DC power source;

- No neutral input connection is required at the rectifier input stage;
- No effects to the FC output performance or reduced impact of the inverter power components whilst supplying specific loads; in addition the inverter transformer minimizes the impact of third harmonic disturbances, prevents the effects of energy back-feed into the inverter when supplying industrial load applications and can supply unbalanced loads.
- High inverter short circuit current to clear faults which occur between phase and neutral on load side (up to three times nominal current).

Output transformer housed within a cabinet which allows for a significant reduction in the footprint and provides space savings.

ZERO IMPACT SOURCE

The Master HP FC UL features the added advantages of the Zero Impact Source formula offered by an IGBT-based rectifier assembly. This eliminates problems connected with installation in networks with limited power capacity, where the FC is supplied by a generator set or anywhere there are compatibility problems with loads that generate current harmonics. Master HP UL series FC have zero impact on the power supply source, whether it is a mains grid or generator set:

- input current distortion <3%
- input power factor 0.99
- power walk-in function that ensures progressive rectifier start up
- start-up delay function, to restart the rectifiers when mains power is restored if there are several FC in the system.

This provides savings in installation costs via:

- a smaller electrical infrastructure.
- smaller circuit protection devices
- less wiring.

BATTERY CARE SYSTEM: MAXIMUM BATTERY CARE

Master HP FC UL uses the Battery Care System, which optimises battery performance in order to extend the battery life for as long as possible.

MAIN FEATURES

- Compact size: e.g.: only 1318 in2 for Master MHT FC 200 UL
- Reduced weight for transformer based FC
- Double load protection, both electronic and galvanic, towards the battery.

The entire Master HP FC UL range is suitable for use in a wide range of applications.

Thanks to the flexibility of configuration, available options and accessories, it is suitable for supplying any type of load, e.g. capacitive loads such as blade servers, rather than motor drivers or any other critical vertical application. Power supply reliability and availability are ensured for critical applications by distributed parallel configurations of up to 8 units, for redundant (N+1) or power parallel configurations.

ADVANCED SUPERVISION

Master HP series FC have a front panel mounted graphic display providing FC information, measurements, status updates and alarms in different languages, with wave form displays including voltage/current and providing a kWh reading that can be used to measure IT loads and calculate a Data Center PUE (power usage effectiveness) ratio.

OPTIONS

SOFTWARE

PowerShield³
PowerNetGuard

ACCESSORIES

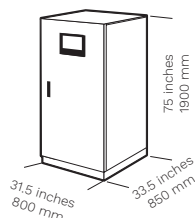
NETMAN 204 UL
Multi I/O (Relay Alarm card and generator Interface)

PRODUCT ACCESSORIES

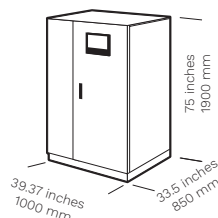
Parallel configuration kit (Closed Loop)
Fully configured battery systems with appropriate autonomy

DIMENSIONS

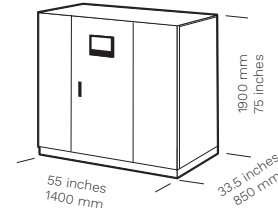
**MHT FC 80 UL
MHT FC 100 UL**



**MHT FC 125 UL - MHT FC 160 UL
MHT FC 200 UL**



**MHT FC 125 UL TCE
MHT FC 160 UL TCE
MHT FC 200 TCE**



MODELS	MHT FC 80 UL	MHT FC 100 UL	MHT FC 125 UL	MHT FC 160 UL	MHT FC 200 UL
INPUT					
Rated voltage [V]	480 three-phase + N				
Frequency [Hz]	45 / 65				
Power factor	>0.99				
Harmonic current distortion	<3% THDi				
Soft start	0 - 100% in 125" (selectable)				
Frequency tolerance	±2% (selectable from ±1% to ±5% from front panel)				
BATTERIES					
Type	VRLA AGM / GEL; NiCd; Li-ion; Supercaps and Flywheel				
Ripple current	Zero				
Recharge voltage compensation	-0.061% x V x °F / -0.11% x V x °C				
OUTPUT					
Nominal power [kVA]	80	100	125	160	200
Active power [kW]	72	90	112.5	144	180
Number of phases	3 + N				
Rated voltage [V]	400 three-phase + N				
Static stability	±1%				
Dynamic stability	from ±5% to ±1% in 20 msec.				
Voltage distortion	<1% with linear load / <3% with non-linear load				
Crest factor [I _{peak} /I _{rms}]	3:1				
Frequency stability on battery	0.05%				
Frequency [Hz]	50				
Overload	110% for 60 min.; 125% for 10 min.; 150% for 1 min.				
INFO FOR INSTALLATION					
Weight [lbs/kg]	1610/730	1742/790	1851/840	2138/970	2447/1110
Weight with TCE [lbs/kg]	-	-	2204/1000	2524/1145	2799/1270
Dimensions (WxDxH) [inches/mm]	31.5x33.5x75 / 800x850x1900		39x33.5x75 / 1000x850x1900		
Dimensions with TCE and Maintenance bypass (WxDxH) [inches/mm]	-	-	55x33.5x75 / 1400x850x1900		
Remote signals	dry contacts (configurable)				
Remote controls	ESD (configurable)				
Communications	Double RS232 + dry contacts + 2 slots for communications interface with SNMP, Modbus, and Bacnet Protocols				
Operating temperature	32 – 104 °F / 0 – 40 °C				
Relative humidity	<95% non-condensing				
Color	Black				
Noise level at 3.3 ft / 1 m (ECO Mode) [dBA]	65			68	
IP rating	IP20				
Standards	UL Standard 1778: 2 nd edition 80 and 100 kVA, 5 th edition from 125 to 200 kVA and CAN/CSA C22.2; From 125 to 200 kVA: UL 60950-1 1: Information Technology Equipment - Safety - Part 1: General Requirements; National Electrical Code (NFPA-70); FCC Part 15 Subpart J class A – Radio Frequency; IEC 62040-3				
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111				
Transport	Pallet jack or fork lift				







Software, Accessories and Connectivity

Software

PowerShield³

SHUTDOWN SOFTWARE

ORACLE SOLARIS citrix redhat ubuntu® debian



HIGHLIGHTS

GRAPHIC MONITORING OF UPS AND ENVIRONMENTAL SENSOR STATUS

PowerShield³ is a simple but powerful UPS management tool. A graphic version is available for all operating systems.

DETAILED DISPLAY OF ALL UPS AND ENVIRONMENTAL SENSOR PARAMETERS

PowerShield³ provides all the information required for first level diagnostics.

EVENTS LOG AND GRAPHIC DISPLAY OF MAIN PARAMETERS

All changes in UPS operating states are logged, as well as the main physical values and parameters. These constantly recorded values are displayed in graphic format.

UPS CONTROL PROGRAMMING

This allows you to automate all the actions normally carried out by the user: turning the server on and off, UPS battery test, etc.

BLOCK DIAGRAM OF OPERATION

A display of UPS operation in the form of a block diagram makes the analysis of UPS operating states more intuitive.

PowerShield³ provides efficient, user-friendly UPS management, displaying all major operational information such as input voltage, applied load and battery charge. The software also provides detailed information on fault conditions and UPS operating states. Developed with a client/server architecture, it is the ideal tool for managing multi-platform network systems.

FEATURES

- PowerShield³ free version: supports a single UPS for the operating systems highlighted in green;

- PowerShield³ full version: supports up to maximum of 32 UPS for all operating systems;
- With sequential and priority-based shutdown, PowerShield³ provides unattended shut-down of all networked PCs, saving any active work on the most widely used applications. Users can define the shutdown priorities for the various computers in the network and can also customise the procedure;
- With multi-platform compatibility, PowerShield³ uses the TCP/IP communications protocol to achieve standardised management and monitoring across the widest possible range of platforms. This makes it possible to monitor computers with different operating systems from a single console, for example monitoring a UNIX server from a PC running Windows and also connecting to UPS located in different geographical areas using dedicated networks (intranets) or the Internet;
- With event scheduling, PowerShield³ users can program their own shutdown procedures, detailing power-off and power-up scenarios to increase system security and save energy;
- With messages management, PowerShield³ keeps users constantly informed about the status of UPS and environmental sensors, either locally or via network messages. A list can also be defined of users who should receive e-mails, faxes, voice messages and SMS messages when faults or sudden mains power supply failures occur;
- Integrated SNMP agent: PowerShield³ features an integrated SNMP agent for UPS management which can send all the information required and generate traps using the RFC1628 standard, and environmental sensors;
- Secure, easy to use and connect, communication is now password protected to ensure UPS system security. Using the new discov-

ery/ browsing function, all UPS connected to a protected computer and/or LAN can be displayed in a list format for monitoring. In the absence of a LAN connection, support is provided for modem-based communication.

DEVELOPED FOR VIRTUALIZED SYSTEMS

PowerShield³ permits to initiate live migration of virtual machines (VM) to automatically and transparently migrate VMs during power disturbance to protected devices by UPS with migration systems such as VMware vMotion™ and Microsoft Live Migration. PowerShield³ can monitor and manage UPS either inside or outside the data center. Can also measure power consumption to help calculate power usage effectiveness (PUE), the standard metric utilized for gauging data center power efficiency.

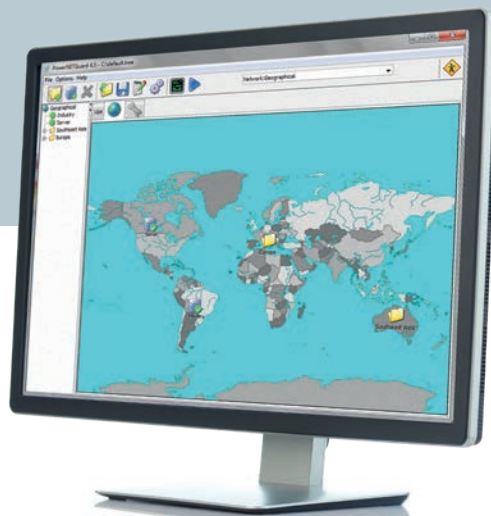
SUPPORTED OPERATING SYSTEMS

- Windows 2008, 2012, 2016, 2019 Server, XP, Vista, 7, 8, 10 on X86, X86_64 and IA 64 processors;
- Microsoft Hyper-V;
- Microsoft SCVMM™;
- Linux on X86, X86_64 and IA64 processors;
- Novell Netware 3.x, 4.x, 5.x, 6;
- Mac OS X;
- VMware ESX, ESXi;
- Citrix® XenServer;
- Xen® open source platforms;
- The most common UNIX operating systems such as: IBM AIX, HP, SUN Solaris INTEL and SPARC, SCO Unixware and Open Server, Silicon Graphics IRIX, Compaq Tru64 UNIX and DEC UNIX, Open BSD UNIX and FreeBSD UNIX, NCR UNIX;
- HP OPEN VMS.

PowerShield³ is available for download at www.riello-ups.com

PowerNetGuard

INVENTORY MANAGER SOFTWARE



HIGHLIGHTS

GRAPHIC MONITORING OF UPS AND ENVIRONMENTAL SENSOR STATUS

PowerNetGuard is a simple but powerful UPS management and display tool. A graphic version is available for all operating systems.

DETAILED DISPLAY OF ALL UPS AND ENVIRONMENTAL SENSOR PARAMETERS

PowerNetGuard provides all the information required for first level diagnostics.

EVENTS LOG AND GRAPHIC DISPLAY OF MAIN PARAMETERS

All changes in UPS operating states are logged, as well as the main physical values and parameters. These constantly recorded values are displayed in graphic format.

CENTRALISED MANAGEMENT

PowerNetGuard is the ideal solution for managing all UPS in an infrastructure using a single application. With this one application you can monitor and manage all your UPS, ensuring prompt warnings in the event of faults or malfunctions.

SUPPORT FOR THIRD PARTY UPS

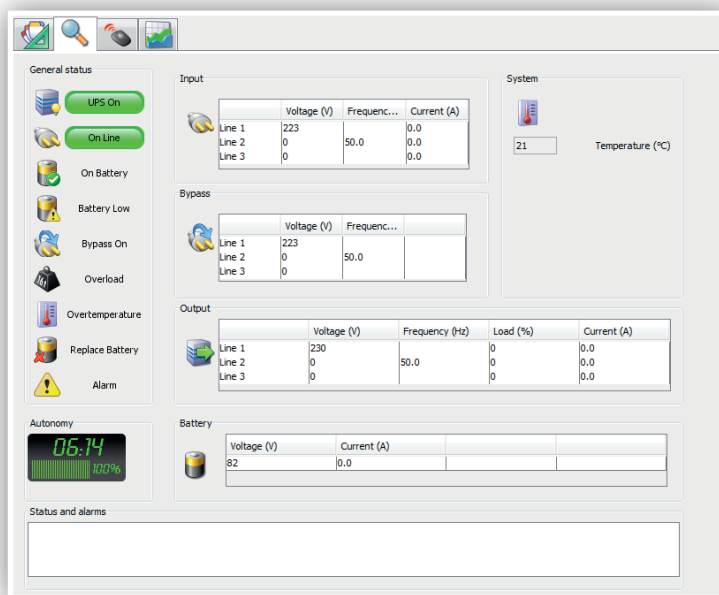
PowerNetGuard also allows you to manage UPS made by other manufacturers via SNMP using their own network boards. This allows you to centralise the management of the UPS fleet into a single system without the need for many different applications, simplifying management and use.

PowerNetGuard software centralises UPS management using network interface (SNMP) communications. It is ideal for Data Center EDP managers and medium to large-sized networks. Using the RFC1628 Management Information Base (MIB), it ensures standardised management for all UPS compliant with this worldwide standard.

FEATURES

- Centralised control of remote UPS via Ethernet with SNMP protocol;
- Multi-level display of geographical areas, building plans, maps, etc.;
- Multi-user access with various security levels;
- Compatible with NetMan and RFC1628 standard SNMP agents;
- Creation of graphs of input and output values and data back-up to file;
- Alarm notifications via e-mail and SMS
- Windows operating systems 10, 8, 7, 2019, 2016, 2012 and previous versions, Mac OS X, Linux.

PowerNetGuard is available for download at www.riello-ups.com



Accessories

NetMan 204

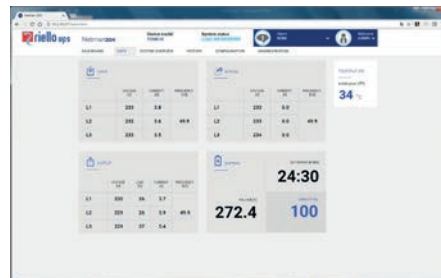
CARD - ETHERNET - SNMP

The NetMan 204 network agent allows UPS directly connected over LAN 10/100 Mb connections to be managed using the main network communication protocols (TCP/IP, HTTP and SNMP). It is the ideal solution for the integration of UPS over Ethernet networks with Modbus/TCP or BACNET/IP protocols. It was developed to integrate UPS into medium-sized and large networks, to provide a high level of reliability in communication between the UPS and associated management systems.



FEATURES

- 32 bit RISC processor;
- Compatible with 10/100 Mbps Ethernet and IPv4/6 networks;
- Wifi ready;
- Compatible with PowerShield³ and PowerNetGuard;
- SNMP v1 and v3 with RFC1628 for PowerNetGuard and NMS connection;
- SNMP v1, v2 and v3 with RFC3433 for the management of environmental sensors;
- HTTPS for UPS control via web browser;
- SMTP for alarm notifications and UPS status updates via email;
- Ldap and Active Directory integration for centralised authentication mechanism support;



- Seamlessly integrates with VMware. Esxi hosts and vCenter servers, enabling you to manage your virtual network to perform shutdown or live migrations of active virtual machines as well as shutdown of physical hosts with delay and priority.
- Modbus/TCP;
- BACNET/IP;
- Maximum expandability;
- USB host for Pendrive USB connection;
- Events log and data management;
- Wake-on-LAN management for starting computers via TCP/IP network;
- Other standards: DHCP, DNS, RARP, FTP, NTP, ICMP, IGMP;
- Management of environmental sensors;
- Configurable via Telnet or SSH sessions, and web;
- Firmware upgradeable via microSD and web browser.



NetMan 104

NETWORK CARD

The NetMan 104 network agent allows UPS directly connected over LAN 10/100 Mb connections to be managed using the main network communication protocols (TCP/IP, HTTP, HTTPS, SSH, SNMPv1, SNMPv2 and SNMPv3). It was developed to integrate UPS into medium-sized and large networks, to provide a high level of reliability in communication between the UPS and associated management systems.

FEATURES

- Allows control and monitoring of multiple UPSs through RJ-45 ethernet port;
- Built-in web server;
- Real-time dynamic graphs of UPS data (voltage, frequency, load level, battery level);
- Warning notifications via audible alarm, broadcast, mobile messenger, e-mail and SNMP traps;
- Historic data log stored in centralized PC database;

- Simple firmware upgrade with one click
- Password security protection and remote access management;
- Supports optional environmental monitoring detector for temperature, humidity and smoke.



MultiCom 384

CARD - RELAY I/O INTERFACE

The MultiCom 384 provides a set of relay contacts for managing UPS alarm notifications and operating states. The board has two removable terminal boards. One of these terminal boards includes the ESD (UPS Emergency Shut Down) and RSD (Remote Shut Down) signals. The board also provides the possibility of associating Battery Working, Bypass, Alarm and Battery Low warnings with potential free contacts

on normally close or normally open contacts.

FEATURES

- Max. current 3 A at 250 V
- Signal-contact customisation
- Normally Open or Normally Close configuration for each contact



I/O Relay card

EXPANSION BOARD

The I/O expansion board for the Master range is equipped with:

- 6 outputs with NC/NO potential-free contacts (250 V/5 A), electrically isolated from each other and from other circuits
- 2 self-powered inputs.

Each output or input can be configured with different meanings, using the associated menu.



Multi Panel

REMOTE DISPLAY INTERFACE

The Multi Panel is a remote monitoring device that can provide a detailed UPS status overview in real time. This device is able to display mains power, output and battery readings as well as UPS operating states. The high visibility graphic display supports English, Italian, German, French, Spanish, Russian, Chinese and many other languages. It has 3 independent serial ports, one of which allows for UPS monitoring via the MODBUS/JBUS protocol (on either an RS485 or RS232 serial line). The other independent serial lines can be used to connect devices such as the NetMan 204 or a PC running PowerShield³ software.

FEATURES

- High visibility LCD with graphic functions
- Management of three independent serial lines;
- Port configuration for MODBUS/JBUS as RS232 or RS485;
- Suitable for integration with the main BMS management programs;
- Firmware upgradeable via serial port.



Connectivity

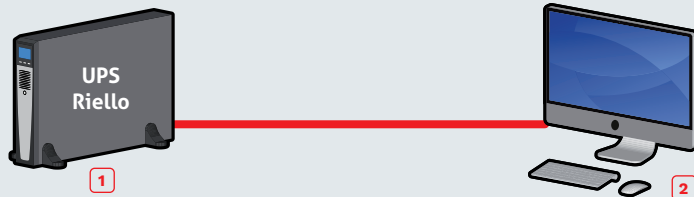
Index of configurations

Connecting a UPS to other devices, sensors, computers and other specific devices, means on the one hand allowing the user to monitor UPS operating parameters and prevent critical situations, and on the other hand provides the UPS with input parameters from the working environment. By processing these parameters the

UPS is able to activate/deactivate itself, communicate its status and much more. This brief overview summarises some of the basic connectivity configurations, grouped according to the end purpose and situation surrounding each case.

- **Point to point connections;**
- **Multipoint connection;**
- **Connection for UPS in parallel setup;**
- **Field bus connections;**
- **Bus connections over Ethernet;**
- **Field bus connections;**
- **Serial bus connections.**

POINT TO POINT CONNECTIONS



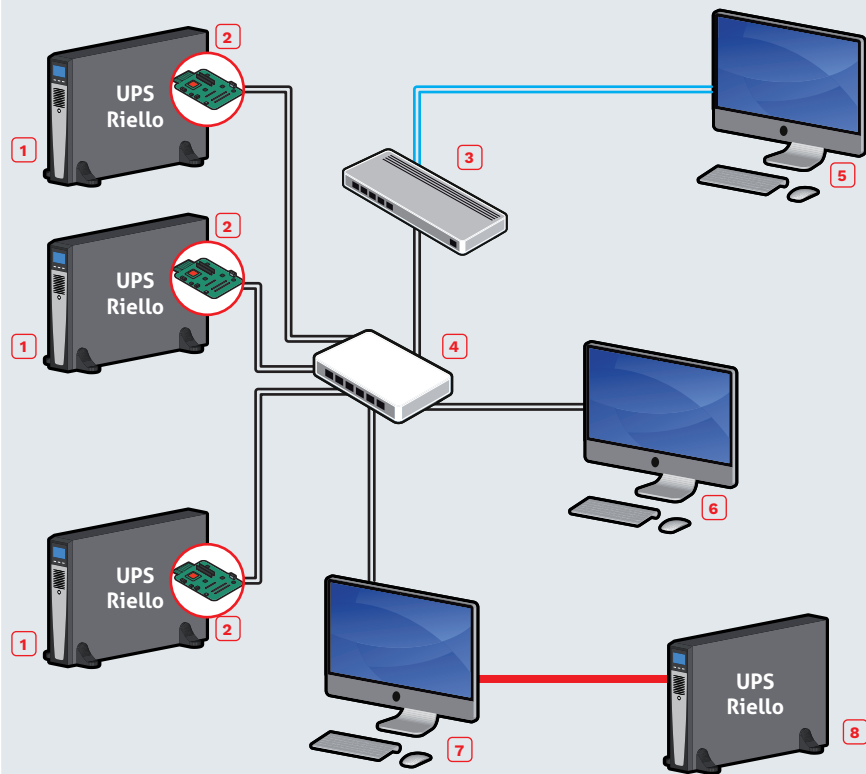
Controlling the UPS from 1 workstation

- 1 UPS connected to load
- 2 Local computer with PowerShield³ version FREE

— USB or RS232



DISTRIBUTED CONNECTION (MULTIPOINT)



Connection with more than 1 UPS.

The FULL version of PowerShield³ software is required as well as a NetMan 204 communication board on each UPS.

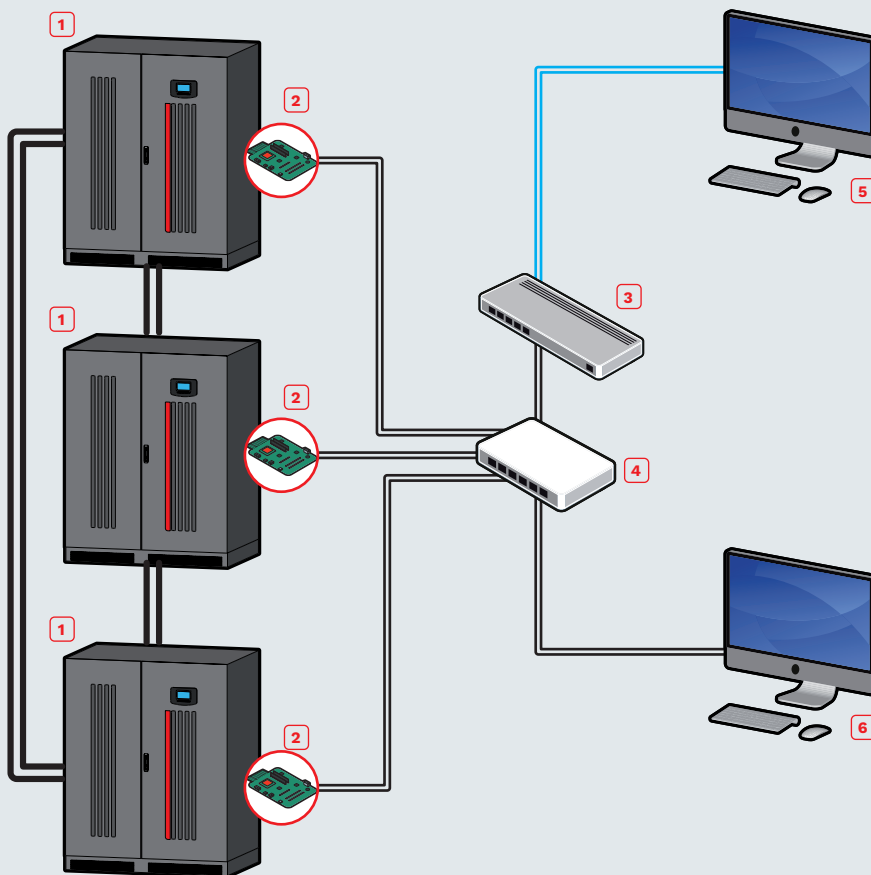
- 1 UPS connected to load
- 2 NetMan 204 board
- 3 Firewall
- 4 Switch
- 5 Remote computer connected via web
- 6 Local computer
- 7 Local computer that controls the UPS (8) via USB or RS232, and UPS (1) via LAN and Ethernet
- 8 UPS connected to load

— USB or RS232

— Ethernet

— World Wide Web

CONNECTION FOR UPS IN PARALLEL SETUP



The FULL version of PowerShield³ software should be used for managing setups with several UPS installed in parallel, and each UPS must have a NetMan 204 board installed.

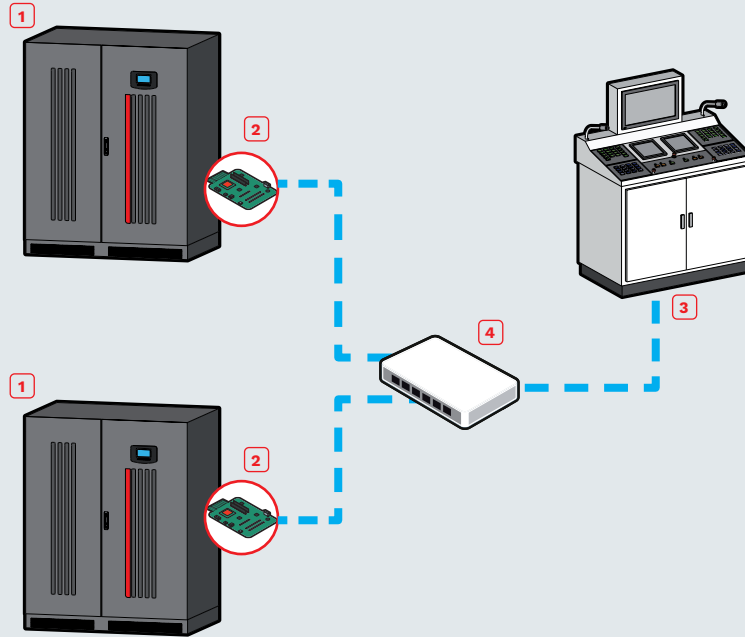
- 1 UPS in parallel setup connected to the load
- 2 NetMan 204 board
- 3 Firewall
- 4 Switch
- 5 Remote computer connected via web
- 6 Local computer

— Ethernet

— World Wide Web

— Parallel setup bus

FIELD BUS CONNECTION OVER ETHERNET

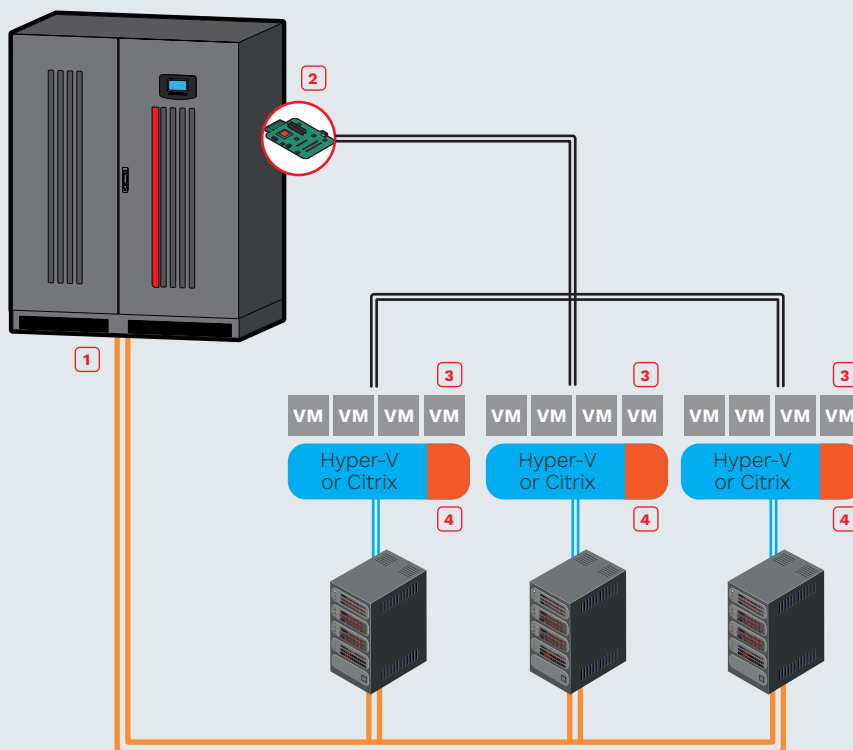


For UPS management in industrial or civil environments requiring Modbus protocol communication over Ethernet.

- 1 UPS connected to load
- 2 NetMan 204 board
- 3 SCADA management system
- 4 Switch

- ■ Modbus / TCP over Ethernet

POWERSHIELD³ ON VIRTUALIZED SYSTEMS: MICROSOFT HYPER-V; CITRIX



PowerShield³ software should be used for managing setup with UPS, a specific script to shut down the virtualized system must be used, UPS must have a NetMan 204 board installed.

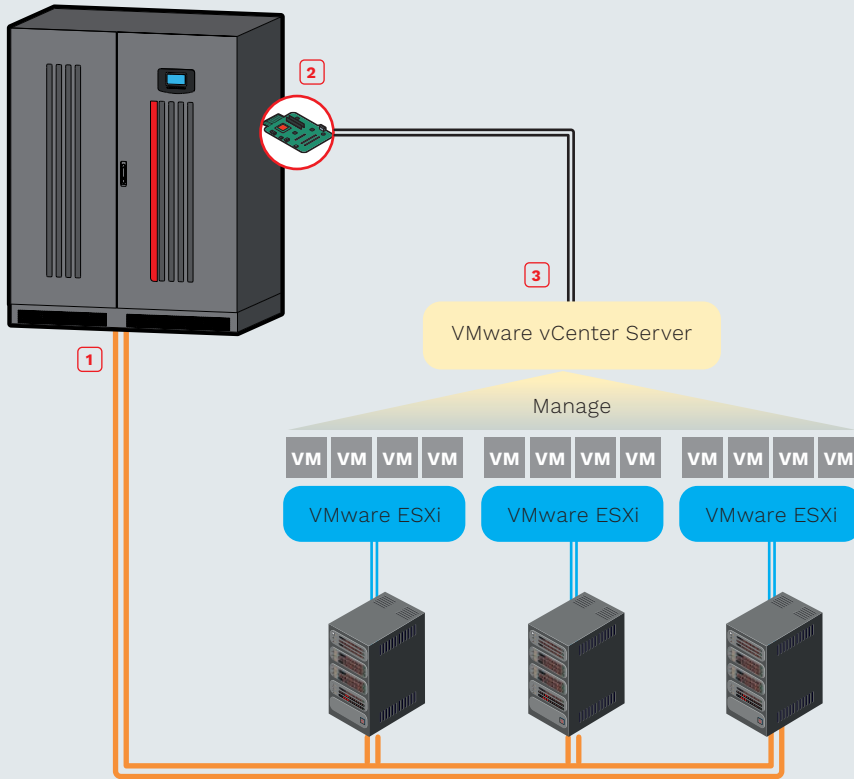
- | | |
|---|--------------------------|
| 1 | UPS |
| 2 | NetMan 204 |
| 3 | Virtualized system |
| 4 | PowerShield ³ |

=====

== Ethernet

Power connection

NETMAN 204 ON VIRTUALIZED SYSTEMS: VMWARE ESXi



NetMan 204 should be used for managing Esxi hosts and vCenter servers, enabling you to manage your virtual network to perform shutdown or live migrations of active virtual machines as well as shutdown of physical hosts with delay and priority.



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ARABIAN PENINSULA

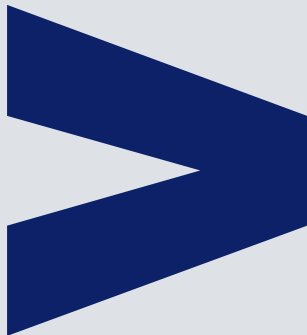
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