

Power protection
systems on board for
safety and business

POWERWARE®



Technology-dependent ships need secure power

Of course the first thing to secure in a ship is the safety and navigation equipment. But the money comes from the entertainment. Let Powerware make sure power glitches won't stop your customers' spending in your onboard restaurants, casinos, shops and nightclubs. Powerware has supplied reliable marine uninterruptible power systems (UPS) to hundreds of vessels over more than 30 years. And no matter where in the world your ship sails, Powerware's global service network is always at hand.

The increasing amount of new technology installed on board presents a whole new set of challenges to the electrical power supply of a vessel or a rig. Today's sophisticated high technology equipment can fail to do its work or even get damaged if the input power has disturbances or breaks down completely. That is why power systems that supply uninterruptible and clean power are essential on board. These systems are called Uninterruptible Power Systems or UPS systems.

The equipment that needs power protection can be roughly divided into:

- safety and cruising related systems, such as navigation equipment and emergency lighting. Classification organisations normally require UPS protection for these systems.
- commercial applications, such as casinos and EPOS devices at restaurants and shops. Customer satisfaction depends on the smooth operation of these systems.
- business and management support, such as computer systems that enable continuous business management.
- special systems on board special vessels. Exploring, drilling, lifting, and cable laying, for example, is accurate and sensitive work where mistakes cannot be tolerated.

Powerware

Powerware has more than 30 years of experience in supplying the marine industry with Uninterruptible Power Systems (UPS). Powerware integrates a full line of AC and DC power systems, power conversion products, power management software, remote monitoring, turnkey integration services and site support. Powerware offers service on every step of installation projects from detailed design to a full installation.

Product lines

The Powerware product offering includes:

- AC UPS Systems 1- and 3- phase 1kVA – 5MVA
- DC UPS Systems for 24V, 48V, 110V and 220V voltages
- battery systems, cabinets and racks
- power converters, eg frequency converters
- power management and monitoring software
- customised systems built to customers' exact needs

Applications onboard ship are many



- Navigation equipment
- Radio and telecom
- Satellite communication



- Business and customer satisfaction
- Cash registers (EPOS) at hotels, tax free and other shops, restaurants, casinos and other entertainment venues



- Computer systems and networks
- Internal cable TV
- Intercom, security camera and audio visual systems
- Emergency Public Announcement system



- Emergency lighting
- Ship automation



- Azipod control
- Water-proof doors
- Power distribution, filtering
- Control/monitoring system



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Technology

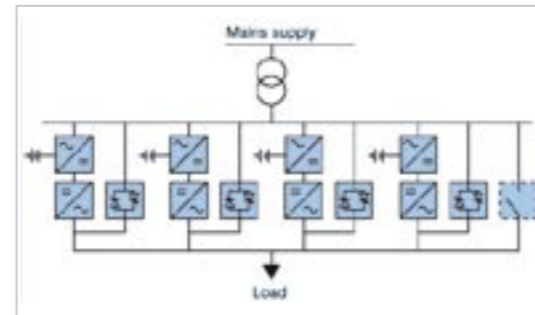
The harsh environmental conditions and the critical nature of the protected equipment set special dependability requirements for marine UPSs.

All Powerware marine UPSs are designed to meet the most stringent industry standards. The double conversion online topology with a static bypass switch is Powerware's choice for marine use. This topology protects against all types of power disturbances that may occur in the supplying network and it is the only topology that meets the highest performance class, VFI-SS-111, requirements. All Powerware UPSs are tested and certified to meet the appropriate safety and EMC standards.

Powerware UPSs are built into one cabinet that houses all the electronics: the rectifier, the inverter, the static bypass and the microprocessor control. This configuration allows the entire system to be controlled as one integral device. This leads to higher reliability than using separate power converters. It also saves plenty of valuable space.

The most critical loads may require increased protection. Therefore all 3-phase systems can be connected to parallel redundant configuration. In such a system two or more UPSs are supplying and sharing the same load. Should a failure occur in any of the UPS units, the faulty unit is automatically disconnected from the load and the remaining unit or units continue to supply the load. This redundancy leads to extremely high system level reliability.

System performance monitoring is often crucial for continuous operation. Therefore a versatile combination of remote communication options via serial communication ports and potential free contacts are available.



Picture 2. Parallel redundant system

Approvals

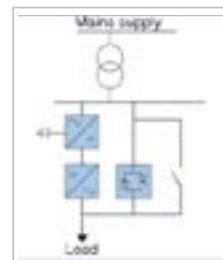
Powerware has been working for system testing and certification with eg Lloyd's Register of Shipping, Det Norske Veritas (DNV), Germanischer Lloyd, Bureau Veritas, American Bureau of Shipping (ABS), RINA, Korean standard.

References

Over the last 30 years Powerware has had the pleasure to work with top shipping companies and ship builders. Our list of references includes UPS deliveries for a wide range of vessels from cruise liners and ferries to ice breakers; from LNG carriers and cable ships to oil rigs.

Services

Powerware's global service network comprises more than 1,200 service professionals worldwide. They make sure you get the same high quality services wherever you operate, delivered by your local Powerware Authorised Service Provider. We are available for our customers in all main ports around the world.



Picture 1. Online UPS

Offshore and marine offering highlights



Powerware 9340/9370

Power range 80–250 kVA

- Double conversion online technology
- Three-phase input and output
- Hot Sync parallel redundant systems up to 4 parallel
- Typical applications: emergency lighting, computers

Powerware 9305

Power range 7.5–80 kVA

- Three-phase input and output
- Hot Sync parallel redundant systems high-nines reliability
- Typical applications: cash registers, computers, casino, emergency P.A.
- Audio-visual equipment
- Bridge equipment



Powerware 9155

Power range 8-15 kVA

- Double conversion online technology
- Three-phase input and output
- Hot Sync parallel redundant systems up to 4 on parallel
- Typical applications: navigation, communications, automation

In addition, a number of battery and transformer options, power distribution panels and other optional devices can be delivered in external battery & option cabinets. Powerware's full range of products also includes DC systems and operating software.





Powerware has a strong presence along the main oil and gas flows around the globe.

About Powerware

Powerware Corporation today, Powerware and site support, providing a seamless solution with more than 40 years of experience.

Powerware systems and services deliver the high nines of availability demanded by today's digital economy. Powerware products and services are used in local and wide area networking, data and voice over IP, co-location facilities, fixed-line and wireless communication networks and industrial manufacturing. Powerware Corporation is headquartered in Raleigh, North Carolina, US.

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