

Marine & offshore UPS

Power protection on board



EATON

Powering Business Worldwide

Power protection systems on board for safety and business

Our top priority is securing the continuity of your business. Eaton's state-of-the-art UPS hardware, experience, problem-solving capabilities and commitment to good customer and maintenance services have made us the market leader in marine and offshore UPS solutions.

We have extensive experience in supplying the marine industry with uninterruptible power systems. Eaton® integrates a full line of uninterruptible power systems, power conversion products, power management software, remote monitoring, turnkey integration services and site support. Eaton has direct sales and service presence in more than 140 countries around the world. www.eaton.com/powerquality

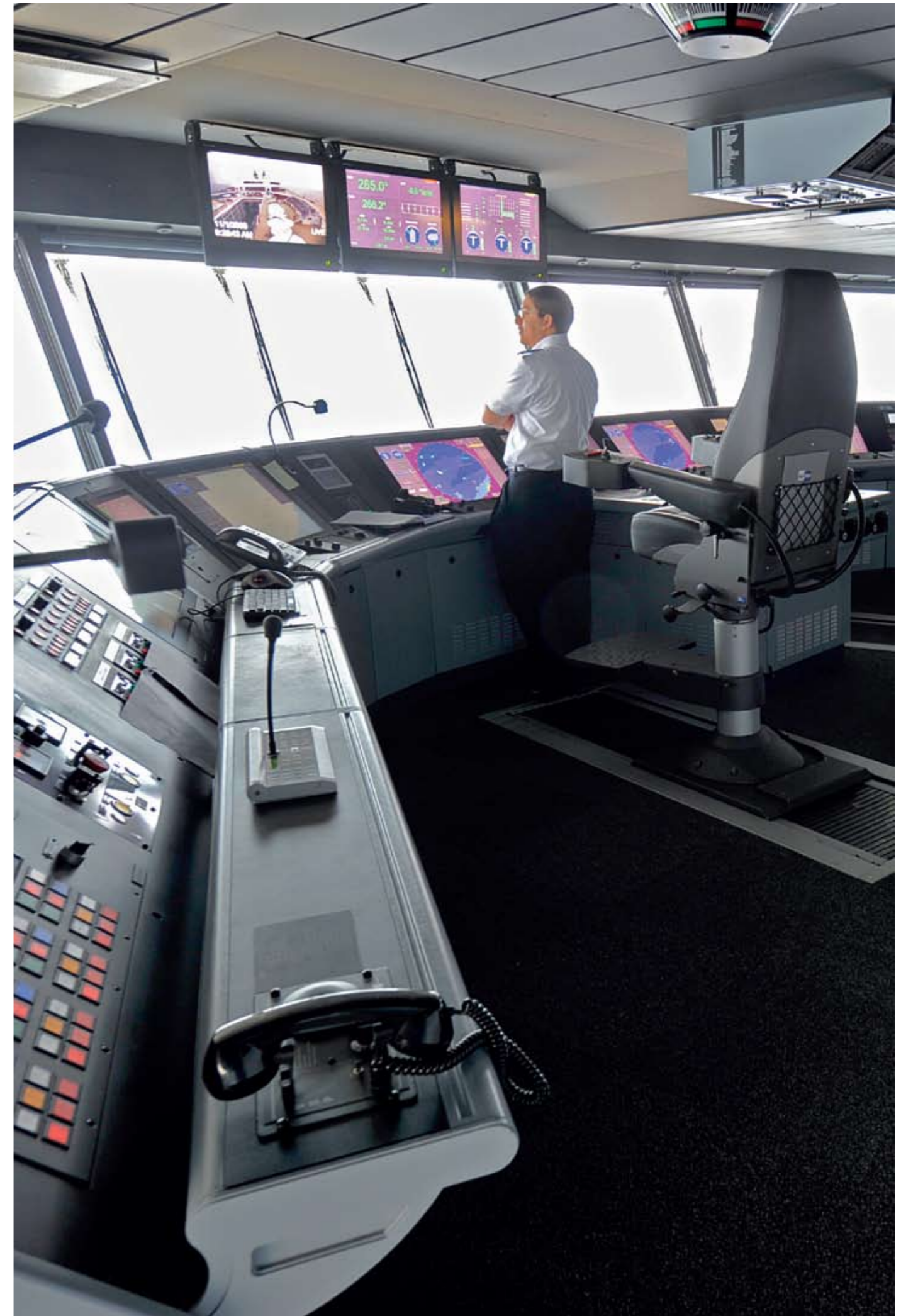


Powering marine and offshore applications

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.
- **Special systems on board special vessels**. Exploring, drilling, lifting, and cable laying, for example, is accurate and sensitive work where mistakes cannot be tolerated.
- **Business and management support**, such as computer systems that enable continuous business management.



Technology

Eaton is experienced in delivering solutions for the most demanding applications. As an example, marine UPSs have special dependability requirements due to harsh environmental conditions and to the critical nature of the protected equipment. Eaton has supplied marine UPSs to hundreds of vessels over the years.

Eaton marine UPSs are designed to meet the most stringent industry standards. The double-conversion online topology (*picture 1*) with a static bypass switch is Eaton's choice for marine use. This protects against all types of power disturbances that may occur in the supplying network and is the only topology that meets the highest performance class, VFI-SS-111, requirements. All Eaton UPSs are tested and certified to meet appropriate safety and EMC standards.

Eaton 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.

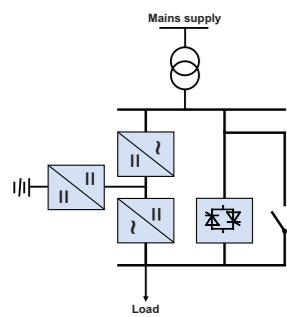
Higher reliability

The most critical loads may require increased protection. Therefore all 3-phase systems can be connected to parallel redundant configuration (*picture 2*).

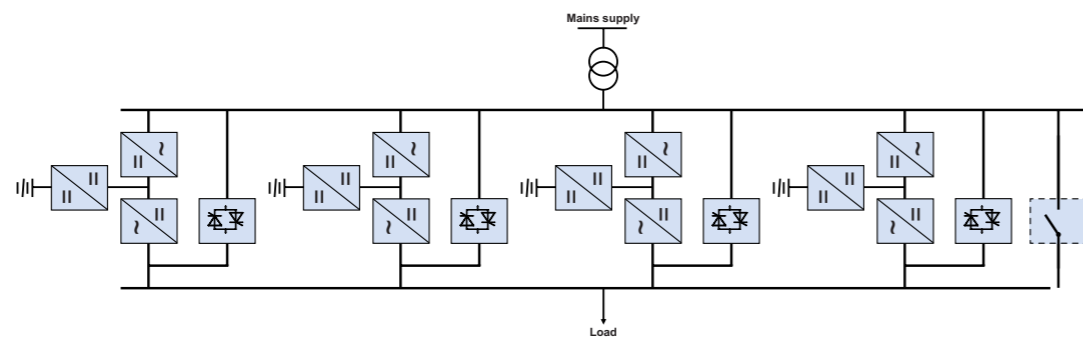
In such a system two or more UPSs are supplying and sharing the same load. Should a failure occur in any of the UPS units, the faulty unit is automatically disconnected from the load and the remaining unit or units continue to supply the load. This redundancy leads to extremely high system level reliability.

Communication options

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 1.
Double-conversion online UPS topology



Picture 2.
Parallel redundant UPS system



Applications



Source: STX Europe

- Satellite communication
- Voyage Data Recorder
- Dynamic Positioning System
- Azipod control

- Internal cable TV
- Intercom, security camera systems
- Emergency Public Announcement
- Business and customer satisfaction

- Water-proof doors
- Power distribution, filtering
- Control/monitoring system
- Computer systems

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

- Emergency lighting
- Ship automation
- Navigation equipment
- Radio and telecom



Products

Eaton Marine UPS

Small systems 0-3 kVA

DNV type approved on-line double conversion UPS with automatic bypass Rack/Tower versatile, multilingual LCD display, hot swappable batteries, power management software, USB and Serial port.

Mid range systems 8-160 kVA

Double-conversion online technology with power ratings 8-10kVA, single-phase input and output, 8-30kVA, three-phase input and single-phase output and 8-160kVA three-phase input and output, small foot print, patented Hot Sync® parallel capability up to four redundant systems, ABM™ technology to extend battery service life, wide communication options.

Large systems 225-1100 kVA

Double-conversion online technology with power ratings 225-1100kVA, three-phase input and output, small foot print, possible for inherent redundancy, patented Hot Sync parallel capability up to four redundant systems, ABM technology to extend battery service life, wide communication options.

Customised solutions

Beyond standard product offering it is possible to do project based modifications to meet environment requirements and customer needs. Whether these modifications are related to physical functional and appearance requirements or there is need for special regulation requirements Eaton can find the optimal solution.



Evolution 1.15 kVA

EX 3 kVA



9155/9355-15 kVA

9155/9355-40 kVA

9395-550 kVA

9390-80 kVA

References

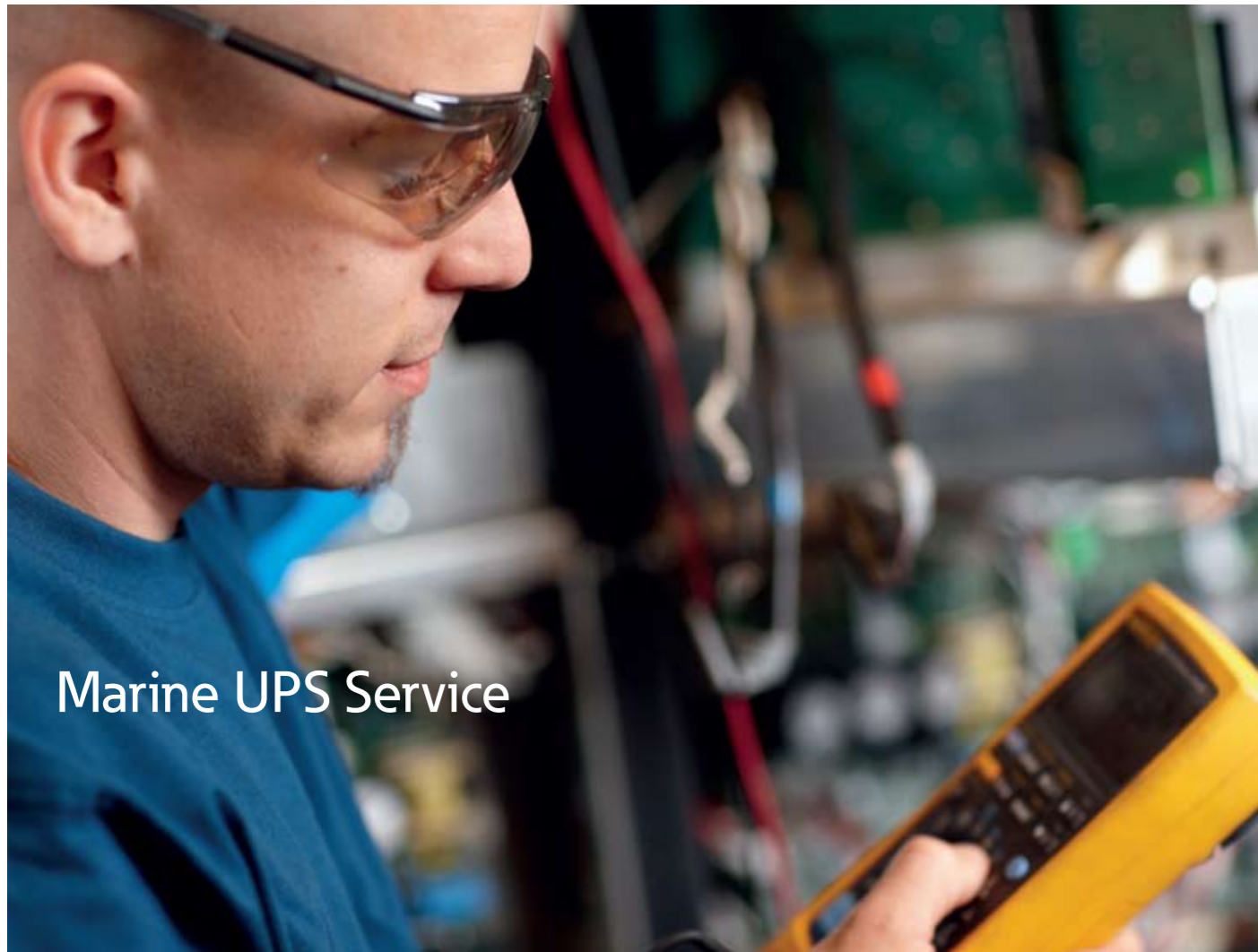
Eaton has the pleasure to work with top shipping companies and ship builders around the world. Our list of references includes UPS deliveries for a wide range of vessels from cruise liners and ferries to ice breakers; from LNG carriers and cable ships to oil rigs. Contact our local sales office for references.

Approvals

Eaton is working for system testing and certification with:

- Lloyd's Register of Shipping
- American Bureau of Shipping (ABS)
- Det Norske Veritas (DNV)
- Germanischer Lloyd
- Bureau Veritas
- RINA
- Korean standard
- CCS

Product	Power rating	Typical Applications	Installation
Eaton Evolution 1150 Marine (line interactive)	1.15 kVA	1 or 2 servers / Storage systems	Tower (free standing)
Eaton EX Marine	1.5, 2.2, 3.0 kVA	Small servers and storage systems, Bridge equipment	Rack / Tower (free standing)
Eaton 9155 Marine	8 - 30 kVA	Navigation, communication, automation, bridge equipment	Tower with mounting rails and vibration absorbers
Eaton 9355 Marine	8 - 40 kVA	Navigation, communication, automation, bridge equipment	Tower with mounting rails and vibration absorbers
Eaton 9390 Marine	40 - 160 kVA	Emergency lighting, computer rooms	Tower with mounting rails and vibration absorbers
Eaton 9395 Marine	225 - 1100 kVA	Emergency lighting, computer rooms	Tower with mounting rails and vibration absorbers



Marine UPS Service

Eaton's UPS service network comprises more than 1200 service professionals and a number of authorised service partners worldwide. They make sure you get the same high quality services wherever you operate. We are available for our customers in all main ports around the world. Eaton offers service on every step of installation projects from detailed design to a full installation.

Eaton service products:

- Installation
- Commissioning and User's trainings
- Preventive maintenance
- Telephone support
- Battery analysis and replacement
- System upgrades
- Spare parts



Powering Business Worldwide

Founded in 1911, Eaton Corporation is a diversified power management company which helps customers operating in a wide variety of industries and residential environments manage power and do more while consuming less energy. As an integrated global company, we are unified in our commitment to powering business worldwide.

Eaton operates in two main sectors: Industrial and Electrical. Eaton Power Quality Division, a part of the Electrical Sector, has more than 45 years of experience in designing and producing innovative power quality products. The result is an expansive portfolio of products, which help to protect our customer's business processes, critical applications and systems from all power problems and failures.

Doing Business Right

When operating on different continents, dealing with different cultures and selling different products under Eaton brand we have something in common in all our businesses: we care intensely about how we get the results.

At Eaton, we're committed to "Doing Business Right" and that's not just a slogan. It's an unwavering commitment to the highest ethical practices and standards of behavior. It's how we conduct

ourselves in interactions with each other, our customers and our business partners. It's how we support our communities, respect the environment, and it's a reflection of our long-standing core values and beliefs about people.

In order to fulfill our promises to our customers and community we have developed a set of internal processes and standards making it possible to enhance our practices and increase efficiency significantly.

Sustainable by design

Sustainability means meeting the current needs of our society in ways that enable future generations to meet their own needs. At Eaton, sustainability is an integral part of the design of our products and production processes right from the start and extends through to the end of the products' life.





For assistance with your power quality needs, contact your local Eaton sales and service representatives. www.eaton.com/powerquality/marine