



Marine Products & Services
Worldwide operation with strong local
presence

Marine Products & Services

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Service Contracts

Marine Academy

ABB's products, solutions and services for marine applications deliver high levels of performance and reliability in demanding conditions. Certification by leading classification societies ensures compliance with major international standards. ABB's global network means that support is quickly available whenever and wherever it is needed.

Your partner – whatever the application

ABB provides machinery suppliers (OEMs), panel builders and integrators with compatible products, allowing shipyards, ship owners and operators to harmonize electrical equipment onboard. This ensures that operation, maintenance and support can be optimized over the vessel's lifetime.

In addition to stand-alone products, ABB offers shipyards and ship owners system deliveries in areas such as power generation and distribution, electrical propulsion and total solutions. We also take responsibility for conceptual design, detail engineering, project management and commissioning of the system.



Wide range of products for all applications

ABB's comprehensive product portfolio encompasses all the equipment and components typically required for machinery onboard the vessel. The power and voltage ranges meet all marine requirements with high efficiency ratings to minimize energy consumption. We also provide a wide range of components for hazardous onboard environments which meet the respective regulatory requirements.

The ABB product platform ensures high quality design, optimum compatibility and extensive product lifetime services. Typical application areas for ABB products include all kinds of pumps, compressors, air conditioning and ventilation systems, cranes, thrusters, winches, steering gear, generators, main and distribution switchboards, panels and protection and control systems.

To give an idea of the significant presence of ABB in the field of marine installations, considering all applications on board from the mini-yachts up to the cruise ships, going through all the types of vessels, but also all applications relevant to the off-shore platforms this brochure gives a description of the products available to cover all the sector demands.

ABB Marine Services

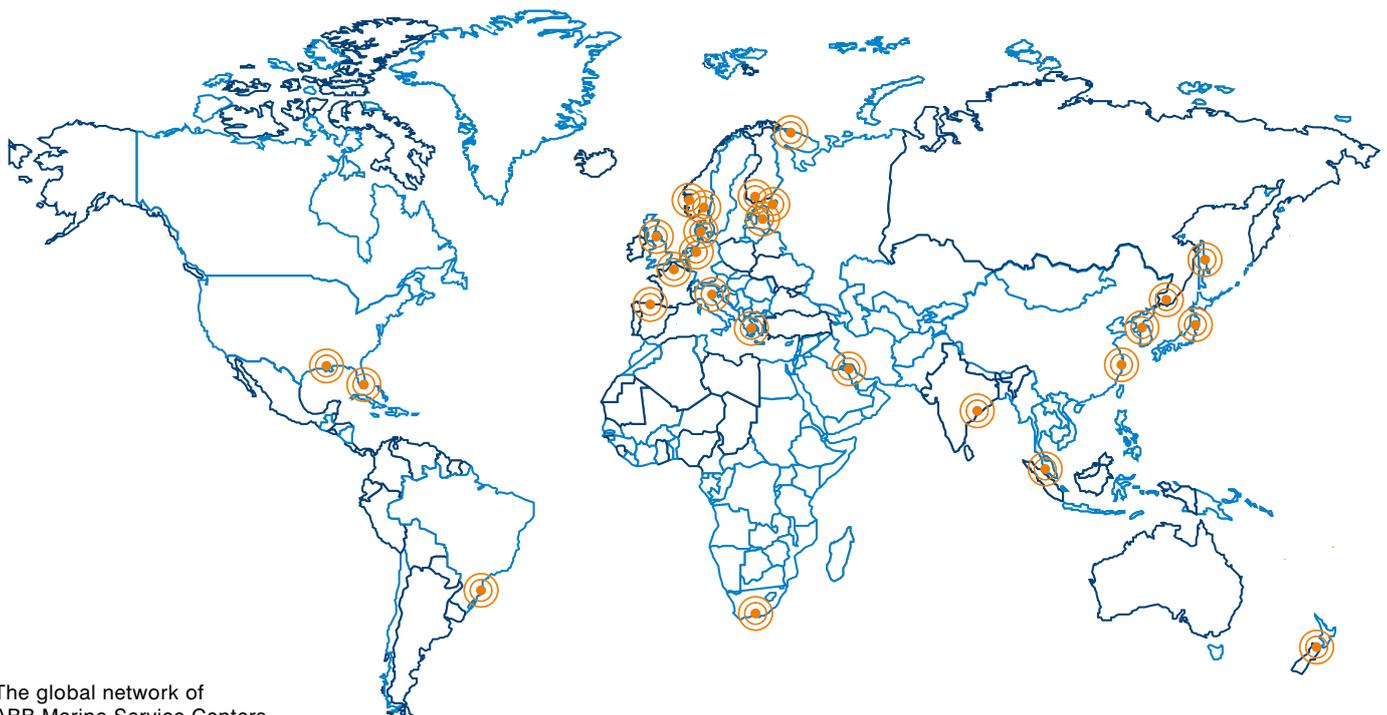
Services built for your business



The key to providing world-class service is to respond quickly and provide better solutions than can be found elsewhere. ABB provides a full range of reliable maintenance and other services to keep your operations running smoothly.

The global reach of the ABB Marine service network ensures that the services are available wherever and whenever they are needed.

All in all, ABB Marine employs some 1000 people. After-sales services, support and training are integral parts of ABB Marine's total delivery. ABB has service operations in more than 100 countries with Marine Service Centers located in the world's main shipping and shipbuilding areas.



The global network of ABB Marine Service Centers

Fuel Saving Solutions

Engine Room Ventilation

Description:

Fan motors are often greatly over-dimensioned to handle the most extreme operating conditions with good margin. Inverter handles this over-dimension in order to adjust motor speed to the desired level.

Benefits:

- Reduced fuel consumption
- Reduced greenhouse emission
- Typical payback 1-2 years

Sea Water Cooling Pumps & Chilled Water Pumps

Description:

Pumps motors are often greatly over-dimensioned to handle the most extreme operating conditions with good margin. Inverter handles this over-dimension in order to adjust motor speed to the desired level.

Benefits:

- Reduced fuel consumption
- Reduced greenhouse emissions
- Mitigates risk of cavitation and reduces mechanical weariness of motor, pump and piping and improve reliability of the system.
- Typical payback 1-2 years

Engine Performance Monitoring - Cylmate

Description:

- Monitoring of important engine parameters through the usage of pressure, angle transducers.
- Measured parameters, like:
 - Indicated Engine Power [kW],
 - MIP [bar], Pdiff (Pmax-Pcomp) [bar]
 - Pmax [bar], Pmax [°CA]

Benefits:

- Pay back by reduced SFOC
- Low life-cycle cost
- Long life time – MTBF more than 10 years
- Maintenance free - blow through design
- Calibration free

Shore-to-ship Power

Description:

Ships can shut down their engines while berthed and plug into an onshore power source. The ship's power load is transferred to the shore side power supply without disruption to onboard services.

Benefits:

- Reduced fuel consumption
- Compliance with environmental regulations
- Zero noise and vibration while in port
- Reduced engine maintenance costs



Shaft Torque Monitor - Torductor 500

Description:

- Torque, Rpm, Power, Energy, Fuel Rate monitoring
- No mechanical contact with the shaft
- No recalibration or periodic zeroing
- No maintenance

Benefits:

- Hull and Engine Performance analysis
- Engine protection
- Advanced Automation Possibilities
- Reduced fuel consumption
- Compliance with environmental regulations (SEEMP)

Advisory Solutions – EMMA™ Advisory Suite

Description:

- EMMA™ Advisory Suite is a decision support tool to minimize the fuel & energy costs for a whole fleet.
- EMMA™ Fleet Control
- EMMA™ Onboard Tracker
- EMMA™ Advanced Optimizer

Benefits:

- Fleet wide operational data
- Real time energy monitoring and management following SEEMP guidelines.
- Real-time decision support for optimizing dynamic trim, power management, hull fouling.

Winch Retrofit

Description:

- Frequency drive to be used in different winching control configurations.
- Anchor winches
- Mooring winches
- RoRo ramp winches
- Offshore winches

Benefits:

- Higher efficiency and reduced emissions
- Improved reliability
- Lower maintenance costs
- Soft-starting reduces startup current peaks
- Reduced stress on the whole system

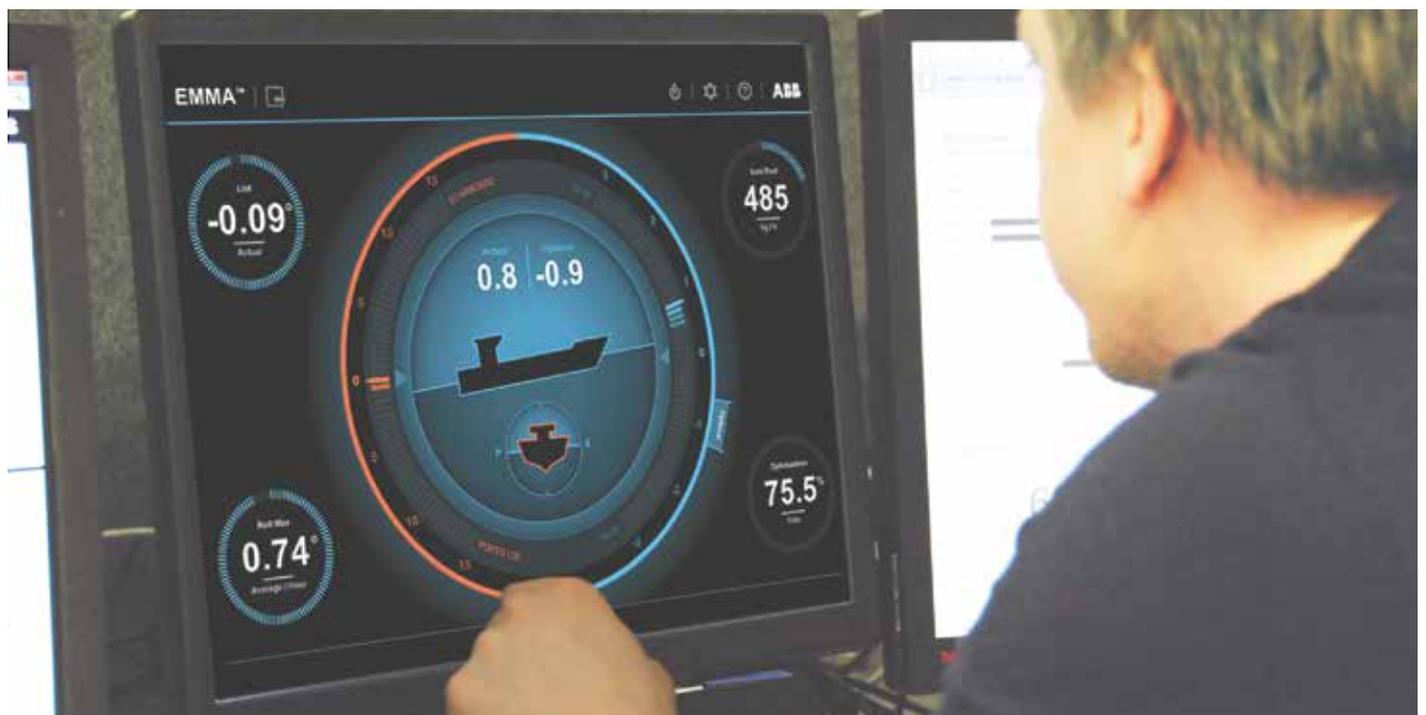
Energy Efficiency Audit & Training

Description:

- A comprehensive list of possible technical and operational improvements that increase the energy efficiency of the vessel.
- Quantified improvement possibilities with estimated investments and annual savings.
- Energy efficiency training

Benefits:

- Fuel saving
- Operation optimization, analysis
- Environmental friendly ships
- Following SEEMP guidelines



Engine Control and Monitoring Solutions

Main Engine Safety & Control Solutions – AMCS500SS

Description:

- Monitors all relevant temperatures and pressures of the main diesel engine and warns the crew before critical limits are reached, so preventive measures can be taken in time.
- Control of engine

Benefits:

- Prevent engine damage
- Efficient control of the engine
- Connection to IAS

Auxiliary Engine Safety Solutions – SS500SS

Description:

- Monitors all relevant temperatures and pressures of the auxiliary diesel engine and warns the crew before critical limits are reached, so preventive measures can be taken in time.
- Control of engine

Benefits:

- Prevent engine damage
- Efficient control of the engine
- Connection to IAS

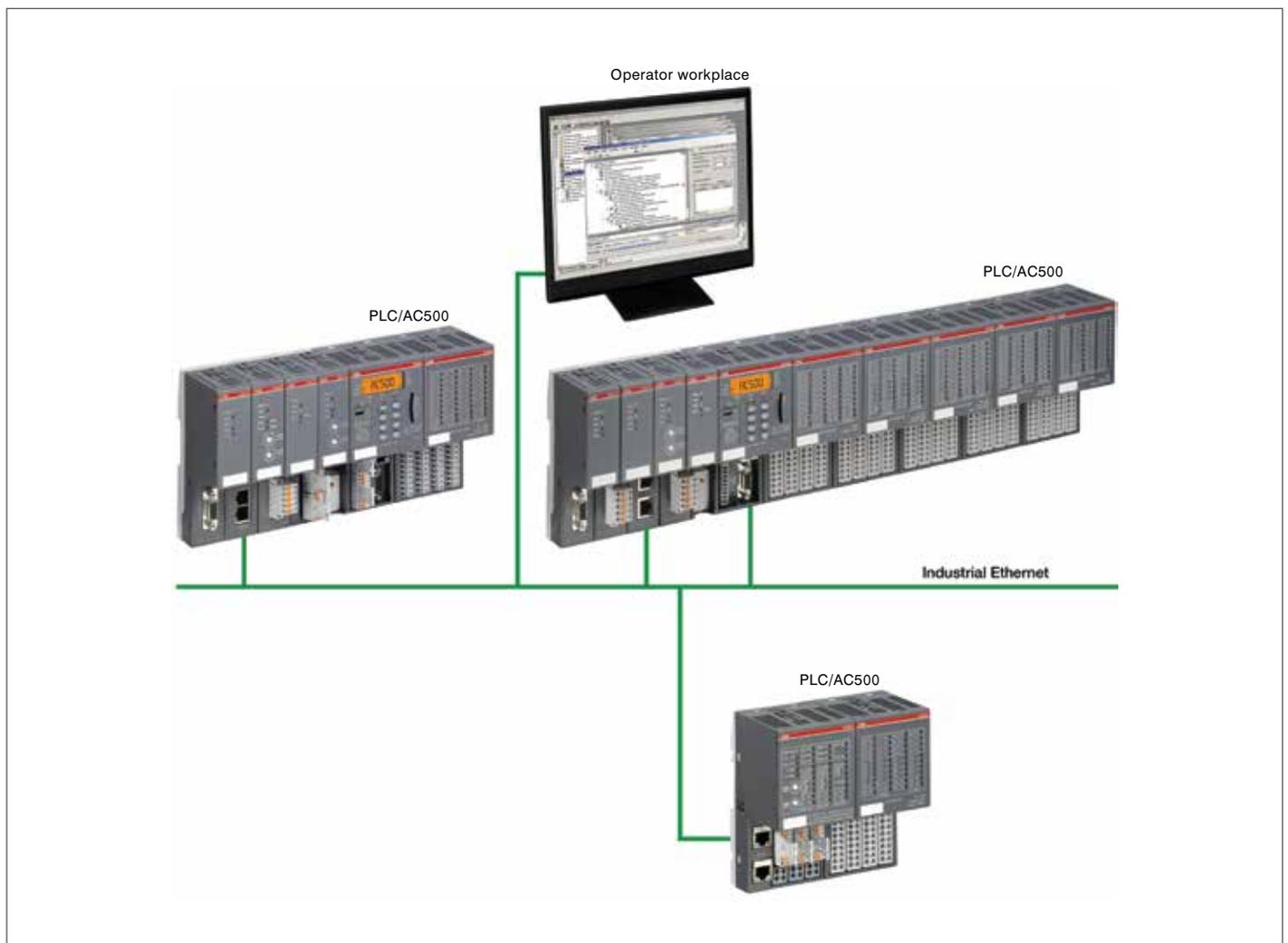
Electronic Governors – DEGO III

Description:

- Ship speed control electronic unit with ABB made actuators.
- Over speed supervision and suppression
- Soft start, reduced emission idle running
- Torque and smoke limits

Benefits:

- The control algorithm is automatically adopted to the actual running condition.
- Back-up control bypassing the governor in fixed propeller applications.
- Excellent load sharing in multi-engine applications.



Vessel Information and Control Solutions

Smart Marine Automation – System 800xA

Description:

- Electrical propulsion control
- Vessel alarm and monitoring systems
- Power management and enhanced power distribution control
- Fire & Gas, and Emergency Shutdown (ESD) systems
- Cargo and ballast control systems
- Advanced remote diagnostics to vessels worldwide

Benefits:

- Integrated safety system saves space and reduces need for training.
- Integration of electrical equipment increases uptime and overall energy efficiency.
- Human interfaces make decisions quicker and easier
- Safeguarding your investment and your assets.

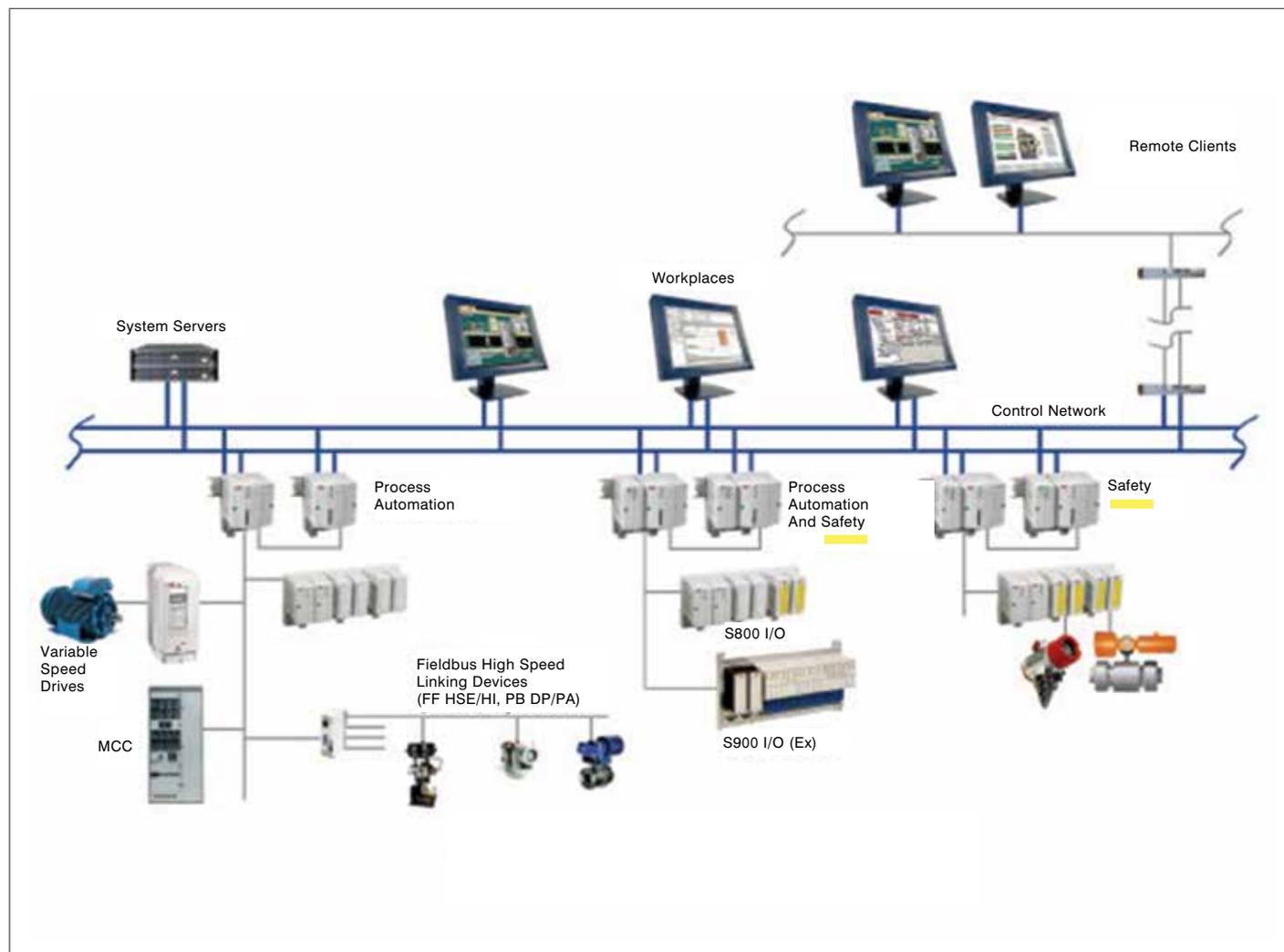
Automation Systems Retrofits

Description:

- Retrofits for ABB and non ABB Automation systems
- Selma
- Advant / Master Systems
- Alsy
- Fahm
- CS31
- Freelance
- Symphony/Harmony (INFI 90)
- Alarm Annunciators (SACO)
- Procontic

Benefits:

- Integrated safety system saves space and reduces need for training.
- Integration of electrical equipment increases uptime and overall energy efficiency.
- Human interfaces make decisions quicker and easier.
- Safeguarding your investment and your assets.



Power Management Solutions

Diesel Generator Monitoring System - DGMS

Description:

- DGMS is monitoring all connected generators simultaneously for fault types that typically cause disconnection of healthy generators. These faults include over/under fueling of the diesel engines and over/under excitation of the generators.

Benefits:

- Proactively monitoring the vessel's diesel-electric generators, mitigates potential onboard power plant problems and failures before they occur.
- Detecting failure
- Creating alarms
- Starting standby diesel engines
- Isolating faulty engines before a blackout condition occurs (only if system crosses pre-set trip limits).
- Isolating faulty switchboard section (only if isolation of faulty engine fails).

Diesel Generator Synchronization Solutions – Symap

Description:

- SYMAP® is a flexible microprocessor-based digital protection and control device for use in low, medium, and high-voltage power systems. With three powerful microprocessors, SYMAP® offers complete protection and control functions for generators, motors (synchronous and asynchronous), transformers, power lines, and distributions.

Benefits:

- All in one device / multi-function device
- Large graphical display with single line and five CB status and control on display
- Integrated PLC functions
- User programmable inputs and outputs
- Engine control for various manufacturers
- Up to five breaker control on display
- Monitoring Power Management System

Diesel Generator Synchronization Retrofits – Gena, Synpol, Dicon

Description:

Retrofit Solution based on Symap

- Gena
- Synpol
- Dicon
- Non ABB products

Benefits:

- Improved reliability
- Lower maintenance costs
- Increased uptime
- Safeguarding your investment and your assets



Motors & Generators

Motors & Generators Products

Description:

Marine motors

- Low voltage high efficiency motors
- High voltage induction motors

Synchronous motors

- Motors for explosive atmospheres
- IEC motors
- NEMA motors
- Synchronous generators for marine applications
- Synchronous generators for diesel and gas engines

Benefits:

- **Improve safety:** Our products are designed and certified to work in the most demanding environments, fulfilling and even exceeding the relevant standards.
- **Increase reliability:** Our products are designed for durability in demanding, continuous and duty operation. We design and manufacture using the highest quality materials. Our production techniques ensure maximum availability and minimize downtime.
- **Lower costs:** We offer products that minimize energy consumption, reduce running costs and CO₂ emissions whilst minimizing maintenance costs.

Motors & Generators Services

Description:

- Spare Parts

- Replicas
- Preventive maintenance
- Predictive maintenance:
 - MACHsense
 - LEAP (Life Expectancy Analysis Program)
 - Azima Vibration Monitoring

Benefits:

- Minimize unplanned downtime
- Extend motors and generators lifetime
- Boost return on investment (ROI)
- Reduce operating risks

Mechanical Power Transmission

Description:

- Bearings
- Couplings
- Gearing
- Belts
- Bushings
- Clutches
- Brakes

Benefits:

- Improve output
- Decrease downtime
- Enhance system value
- Speed installation
- Reduce maintenance
- Lower your total cost of ownership



Low/Medium Voltage Products

Low Voltage Products

Description:

- LV Systems
 - MNS Intelligent Switchgear
- Breakers and Switches
 - Circuit Breakers
 - Switches
 - Fusegear and Cable Distribution Cabinets
- Enclosures & DIN-Rail Products
 - Modular DIN-Rail Products
 - Enclosures and Cable Systems
- Control Products
 - Control and Protection
 - Electronic Products and Relays

Benefits:

- Decrease downtime
- Enhance system value
- Speed installation
- Reduce maintenance
- Lower your total cost of ownership
- Increase safety

Medium Voltage Products

Description:

- Indoor apparatus – vacuum and SF6 circuit breakers.
- Indoor apparatus – vacuum contactors
- Indoor apparatus – SF6 sealed switches
- Indoor apparatus – air insulated switches
- Indoor apparatus – fuses
- Current limiters and Ultra Fast Earthing Switches
- Vacuum interrupters and embedded poles
- Indoor sensors
- Indoor instrument transformers
- Voltage indicators
- Air-insulated primary switchgear

Benefits:

- Decrease downtime
- Enhance system value
- Speed installation
- Reduce maintenance
- Lower your total cost of ownership
- Increase safety



Transformers

Description:

- Unique manufacturer with three coil technologies:
 - Vacuum cast coil
 - RESIBLOC®
 - Open wound
- Power and voltage range produced
 - From 50 kVA to 60 MVA
 - Up to 72 kV
- On Load Tap Changers available
- Drives, excitation and rectifier transformers

Benefits:

- Improved reliability
- Lower maintenance costs
- Increased uptime
- Safeguarding your investment and your assets



Low/Medium Voltage Drives

Low/Medium Voltage Drives

Description:

- The most efficient way to control the process is to control the speed, and the most efficient way to control the speed is to use an electric variable speed drive – a frequency converter.
- A drive controls the speed, the torque or the power on the shaft of an electric motor by converting the fixed voltage, frequency at the network into a variable voltage, frequency on the output to the motor. In this way, the drive can control the variables of a process, such as flow, by controlling the speed of a pump.

Benefits:

- Saves energy
- Improves quality through better process controllability
- Reduces waste and saves raw materials
- Soft start and stop reduces process equipment wear
- Electrical braking of the motor
- Possibility to produce energy for other motors or feed the energy back to network.
- Reduces noise
- Natural resources saved while process efficiency improved.



Measurement Products

Analytical Measurement

Description:

- Process gas chromatography & photometers
- Reid vapor pressure analyzers
- Continuous gas analyzers
- BTU Analyzers
- Continuous emission monitoring systems
- FT-IR/FT-NIR lab & process analyzers
- Remote sensing & spectra radiometers
- Liquid analytical and monitoring systems
- System integration & fabrication
- Engineering, application & support services

Benefits:

- Advanced and reliable technology
- Integrated system solutions – for added flexibility
- Multi-analyzer systems (up to four analyzer modules)
- Unlimited connectivity
- Integrated control and monitoring
- Simple, user-friendly operation
- “Packaging” that fits right in
- Reliable and powerful



Analytical Measurement

Flow Measurement

Description:

- Flow metering systems and products
- Flow computers for custody transfer
- RTUs for low power, programmable I/O needs
- Remote automation solutions
- Production enhancement applications
- Engineering, application and support services

Benefits:

- Advanced and reliable technology
- Integrated system solutions – for added flexibility
- Multi-analyzer systems (up to four analyzer modules)
- Unlimited connectivity
- Integrated control and monitoring
- Simple, user-friendly operation
- “Packaging” that fits right in
- Reliable and powerful



Flow Measurement

Field Instruments & Devices

Description:

- Pressure, temperature and level products
- Actuator & positioner products
- Recorders, controllers and data acquisition products
- Engineering, application and support services

Benefits:

- Advanced and reliable technology
- Integrated system solutions – for added flexibility
- Multi-analyzer systems (up to four analyzer modules)
- Unlimited connectivity
- Integrated control and monitoring
- Simple, user-friendly operation
- “Packaging” that fits right in
- Reliable and powerful



Field Instruments & Devices

DC Grid

DC Grid

Description:

- DC links throughout the vessel and distributes power through a single 1,000 V DC circuit, thereby eliminating the need for main AC switchboards, distributed rectifiers and converter transformers. The Onboard DC Grid combines the best of both AC and DC components and systems, is fully compliant with rules and regulations for selectivity and equipment protection, can be used for any electrical marine application up to 20 MW, and operates at a nominal voltage of 1,000 V DC.

Benefits:

- More functional vessel layout through more flexible placement of electrical components.
- Reduced maintenance of engines by more efficient operation.
- Improved dynamic response and maneuverability
- Increased space for payload through lower electrical footprint and more flexible placement of electrical components.
- A system platform that allows “plug and play” retrofitting possibilities to adapt to future energy sources.
- Up to 20 percent fuel savings.

AC to DC transformation of a generic electric propulsion system



Electric Propulsion Solutions

Electric Propulsion Systems

Description:

- Electric propulsion (DFEP) concept that uses a 4-stroke engine (fueled by either natural gas or diesel) to generate electricity, which is then used to power the carrier's electric propulsion system and meet its overall need for electric power.

Benefits:

- 30% reduction in fuel consumption and a corresponding lowering of harmful exhaust emissions
- Cargo capacity up 6%
- Vastly improved maneuverability
- Faster stopping times
- Blackout prevention

Azipod® Propulsion

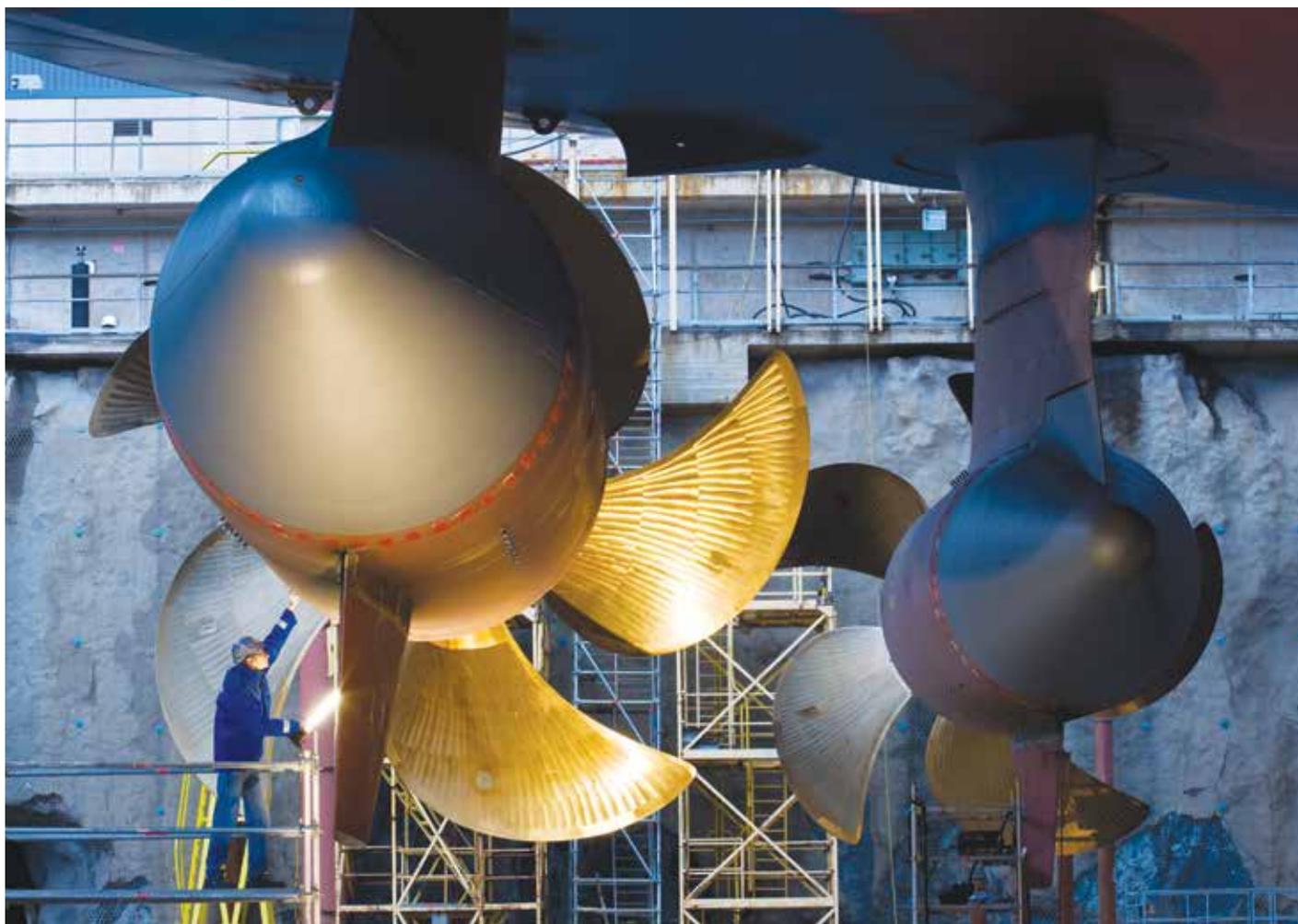
Description:

- In the Azipod® system the electric motor is inside the pod and the propeller is connected directly to the motor shaft.

The AC motor of the pod is driven by electricity from the ship's generator by a cycloconverter. Electric power for the Azipod® motor is conducted through slip rings that let the Azipod® rotate through 360 degrees.

Benefits:

- All-in-one steering and propulsion system
- Flexible ship design
- Simplified ship construction
- High fuel efficiency - low emission
- Outstanding maneuverability
- Low noise and vibration



Service Contracts

Description:

- The Service Contract Concept gives the flexibility to customize agreements, for individual customer and vessel needs.

Benefits:

- Prevent down time and revenue loss
- Reduce maintenance costs
- Allow predictable maintenance budgets
- Develop crew and shore side personnel skills

The ABB Marine service contract brings you several important and valuable benefits, such as consistent system availability, a predictable maintenance budget and easier long-term management of maintenance costs. Thanks to its modular and customizable structure, the service contract easily adapts to your specific requirements and evolves with your business.



Marine Academy

Description:

- Training organization which develops and produces training designed for ship's technical crew
- E-learning
- Basic courses
- Level 1 – product courses
- Level 2 – advanced system courses
- Coaching
- Electrical systems
- Electrical products courses
- Azipod® propulsion
- Automation
- Safety

Benefits:

- Operational excellence
- Reduce down time
- Increase communication with ABB
- Easier to troubleshoot
- Stricter competence requirements to maritime personnel
- Increase awareness on safety to avoid serious incidents
- Energy and economic efficiency



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Marine Services Portal