

Increase ship control precision and reliability, reduce operating costs and protect the environment



AVENTICS™ Marex ship and valve controls

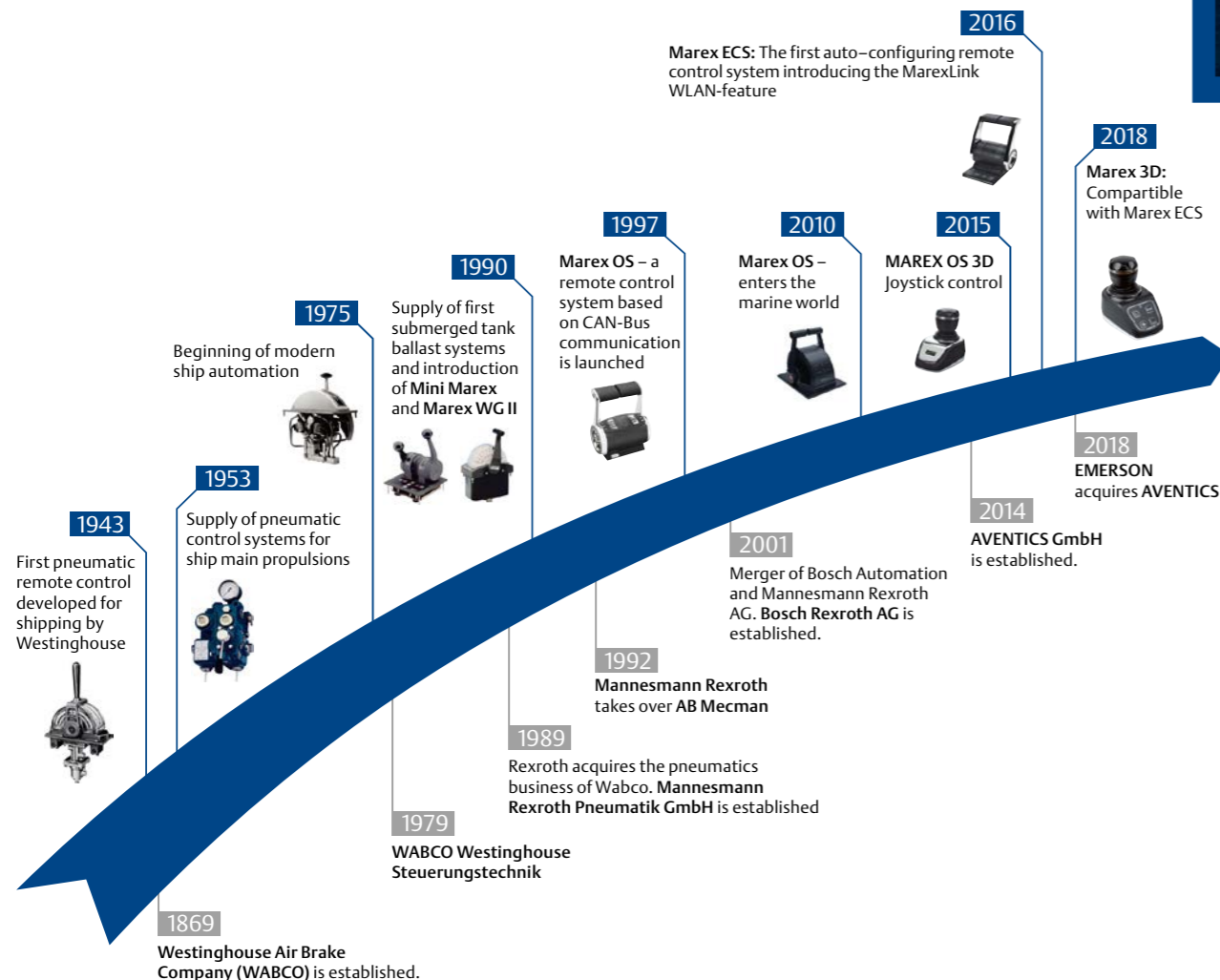
Meet the demands of commercial and recreational vessels with industry-leading pneumatics, valve control systems and ship controls



Ship Controls – it's that easy

Emerson offers a wide range of AVENTICS products for control applications at sea or inland waters. Pneumatic products are complemented by modular, classification approved ship controls with joystick option, valve control systems and components for selective catalytic reduction. While limited commodity availability and the increasing prominence of environmental aspects call for innovative engineering, the operating conditions at sea have not changed: safety and robustness remain paramount. AVENTICS products are developed and manufactured in Germany in accordance with the highest quality standards.

Our innovative, tailor-made system solutions are able to fulfill the different demands of the commercial and recreational shipbuilding industry. OEMs, shipyards, system integrators and ship operators all over the world rely on our engineering expertise and service throughout the full lifecycle of their vessels. Our products can be found on work boats, mega yachts, pleasure boats, passenger vessels or freight carriers of any size.



Pneumatics

Pneumatic components retain their importance for marine engines, with AVENTICS air preparation, starting air valves, and start/stop units in use on two- and four-stroke engines for decades. Emerson's pneumatic controls are tailored to the specific application using class-approved, easy-to-use, robust and durable products. ▶ p4

Valve Control Systems

On larger vessels, intelligent electro-pneumatic valve control systems are used to control fluid tanks of all kinds (e.g. fuel, fresh water or bilge). This AVENTICS product range includes control cabinets, butterfly valves and actuators, SOS units, and backup panels; options such as remote touchscreen operation, monitoring, and data bus communication provide flexible interfaces able to interact with today's ship management systems. ▶ p10

Ship Controls

Emerson's marine engineers have responded to changes in engine and propulsion technology by developing the Marex OS ship control into a class-approved system solution, offering engine remote control, joystick operation, and monitoring functions. With Marex ECS, we have introduced an easy-to-install control system designed specifically for smaller pleasure crafts – the first remote control system which can be adjusted using a smartphone or laptop. ▶ p6

Selective Catalytic Reduction

In exhaust gas purification, AVENTICS products are integrated into systems which transfer the principles of selective catalytic reduction (SCR) from automotive and power generation to marine applications. This substantially reducing levels of nitrogen oxide in exhaust emitted by ships' engines. ▶ p12

Pneumatics overview

Pneumatics are an excellent choice to perform various tasks on board of a vessel, because they are cost-effective, clean and easy to service. Emerson offers a broad range of systems and components which are perfectly adapted to these applications, highly suitable for the harsh environment and class-approved.

Applications

Air preparation units

Our preassembled air preparation units optimize the air for the pneumatic systems in order to prevent failures and downtimes.

Propulsion controls

Our pneumatic control panels for two-stroke engines provide features such as pneumatic start and stop, control of engine RPM, start interlock and pressure monitoring. Pneumatic controls are also available for the clutch and propeller adjustment.

Sliding door controls

Perfectly adapted controls ensure powerful and sensitive operation of sliding doors, safely and reliably despite the ship's movement.

Extreme dry air units

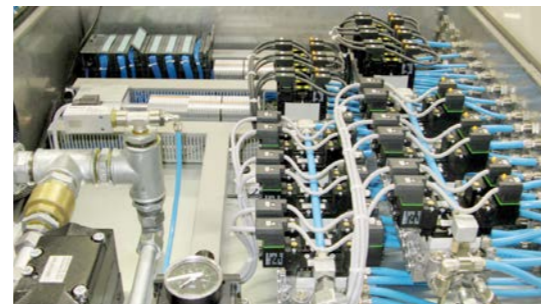
Sensitive electronics are surrounded by a constant flow of extremely dry air to prevent condensation.

Ventilation flap controls

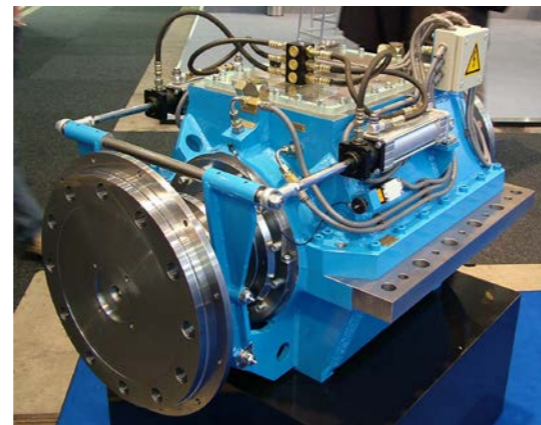
Remote operation of ventilation flaps as part of a cargo ventilation system.

Winch controls

Remote controls for winches with pneumatic brake on towing, fishing vessels or anchor handling support vessels.



- Control cabinet for the operation of cargo room ventilation flaps



- Marine clutch with pneumatic control panel

Product examples

Twin pressure reducing station



- Suitable for up to 40 bar with filter, safety valve and mechanical trip point

Air preparation unit



- With redundancy, used in valve control systems ensuring a continuous operation also during service

Working logic



- Assembly permits to realize complex switching processes by means of space-saving and standardized components

Block valve



- Robust poppet valve used for block and release functions on two- and four-stroke engines for operating pressure up to 30 bar

Starting valves



- Electrically or manually operated, for pressures up to 30 bar

High precision pressure regulating valve



- With mechanical actuation suitable for an operating pressure up to 40 bar and offering a pressure range of 0.35-10 bar

Proportional valve



- ND 3, converting an electric signal into pneumatic pressure, input signal via current, voltage or resistor, vibration resistant to 100 Hz, operating pressure 8 bar

Marex OS – for a safe journey



Sometimes, the smartest way to get around on board is taking a bus. Microprocessor-controlled CAN bus technology opens up the way for new electronic concepts in shipbuilding. The most important keyword: modularity.

Individually configurable and tailored to the propulsion and ship type, Marex OS offers extensive control functions for marine engines and transmissions with fixed or controllable pitch propellers or waterjet applications. CAN bus data communication allows for powerful capabilities and safety in operation. Thanks to the modular setup and numerous parameters, which can be adjusted comfortably within the software, Marex OS is suitable for any type and size of ship. Taking the short path. In a plug-and-play housing.

An open professional system Marex OS

Work vessels with classification, passenger liners, coastal cargo ships and yachts can all rely on one of our most proven products. The Marex OS hardware consists of modular units, made extremely powerful by the bus connection. Our systems are easily integrated and provide efficient, secure control.

Advantages

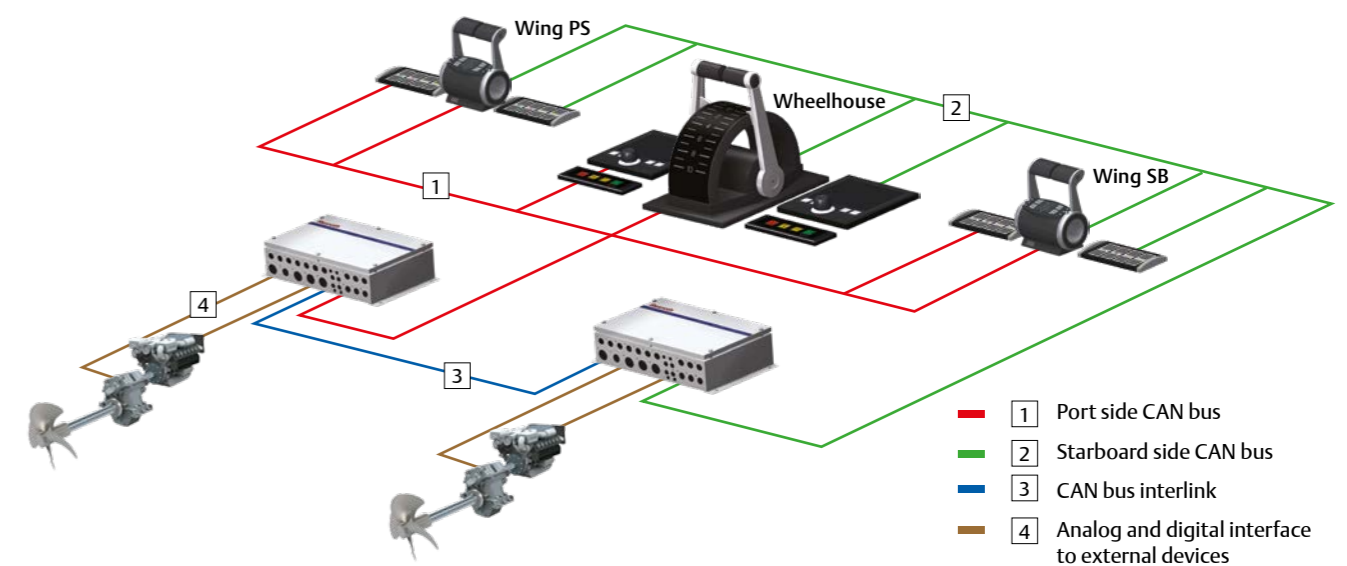
- Easy installation thanks to pre-assembly
- System reliability thanks to one self-monitoring CAN bus per drive train
- Operating elements also suitable for outdoor installation
- Approval of drawing and FAT upon request
- Open for any engine, gearbox and propeller maker

Integrated Functions

- Engine control, speed curves and engine stall protection
- Gear operation, reversing maneuver curves
- Control of PTO and PTI, Trolling and Slip & Grip
- Multi-engine systems
- Calculated ship speed
- Shaft brake control
- Internal software PLC to add special functions
- Standard interface for DP system, Autopilot and VDR



Marex OS System Setup



Marex ECS – the easy control system

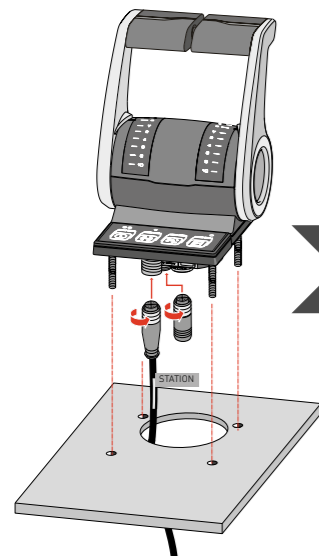
Marex ECS combines user convenience with excellent functionality and good looks. Its timeless appearance blends in smoothly with any ship design, pleasure craft or work boat. State-of-the-art CAN bus technology is used to control single or twin diesel engine applications smoothly from up to four control stations. Needless to say that verified quality and the highest production standards ensure a maximum of reliability and safety in operation. After a simple start-up procedure, Marex ECS is good to go. Optionally, control features can be adapted for a gentle operation which will protect engine and gearbox. Thanks to the integrated WiFi, the adjustments are easily made on a smartphone, tablet computer or laptop.

- Plug-in solution
- Color-coded cabling
- Auto-configuration
- Fine-adjustment via WiFi
- Intuitive operation



Time-saving installation and start up with possibility to fine-adjust

Plug-in



Power-up

Auto-config

Self-check

Ready to go

Optimize



MarexLink



Marex 3D – a new dimension of precision and comfort



Benefits of Marex 3D

- Slow-speed maneuvering with unmatched precision thanks to vessel-specific calculation principle
- Optional hold mode and virtual anchor
- Approved by major OEMs
- Compatible with Marex OS and Marex ECS
- Ergonomic design
- Can be combined with any common thruster type

Marex 3D overview: Intuitively precise

Harbor docking and undocking is becoming easier and safer than ever before. The 3-axis joystick of this intuitive maneuvering aid allows for the simultaneous operation of engines and thrusters. Steer your ship in any direction with precision and comfort in the 3D mode, simply by pushing or turning the joystick. A smart control will coordinate the drives and also hold the heading as an option.

Alternatively, engines and thrusters can be controlled separately. In the 'Thruster mode', moving the joystick will operate only the thrusters, while the engines are controlled via a control head.

In combination with Marex OS and Marex ECS, Marex 3D is a flexible solution for ships of all sizes with the option of up to 6 joystick stations. A perfect match also as a retrofit with existing Marex control systems.

The Marex 3D is designed for use on yachts, speedboats, and pleasure craft of any size. It can be installed with conventional shaft-line, fixed-propeller applications in combination with digital and proportional thrusters.

Marex VCS – the pneumatic valve control and tank sounding system



Undeafed in total cost of acquisition (TCO) analysis thanks to cost effective procurement, reliable continuous operation and low operation expenses: Emerson pneumatic valve control systems feature a proven concept, ongoing personal support through to commissioning, and a global service network.

The system's advantage lies in its simple structure, requiring only one control cabinet and – in the best-case scenario – one closed-loop pipeline. Fully pneumatic, our entire control system does not need any electrical connections or power supplies for the basic system. Even the position feedback of the individual valves is given pneumatically.

- Cost-effective solution
- Low operating pressures from 5 to 7 bar
- Actuators with active position feedback for installation
- Inside and outside the tank
- Single- or double-acting and proportional
- Touch panel operation
- Data interface to ship management systems
- Fluid volume calculation
- Draft measurement
- De-icing of ballast tanks

System solutions tailored to each individual project

The system has a modular architecture, making it easier to realize your desired application in very little time. Through our questionnaires, we can rapidly determine the required functions and adapt our system to the specific requirements for your type of vessel. Both, basic components as well as operating and control modules are quickly coordinated and programmed. Our system solution has proven itself in real-life situations thanks to its fail-proof operation. However, should the need arise, our service organization is within easy reach anywhere in the world.

Solutions for the remote operation of fluid-controlling valves and fluid level measurement

Compressed air preparation



- Pressure reduction and regulation
- Filtering, drying and air reservoir

Control cabinets, pneumatic or electro-pneumatic



- Pneumatic design including only pneumatic operating, indicating and control elements
- ATEX-compliant components for applications in hazardous areas.
- Electro-pneumatic design including the production of electric signals for further processing

Back-up control



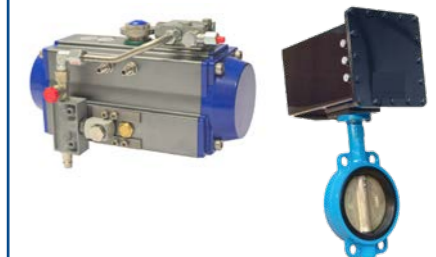
- For access-limited butterfly valves

SOS units



- Design and integration outside the engine room for the emergency operation of safety-relevant valves

Actuators



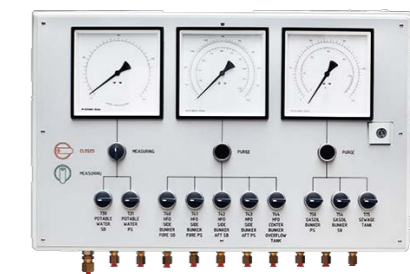
- Various sizes
- Special submersible design for space-saving installation inside tanks
- With or without pneumatic position feedback.

Fuel bunkering safety system



Fuel bunkering can be hazardous under rough conditions as the ship moves up and down. Emerson offer an Avenics pneumatic safety system, which monitors the strain on the fuel line and switches the valve to the safe state if necessary.

Marex Tank Sounding System

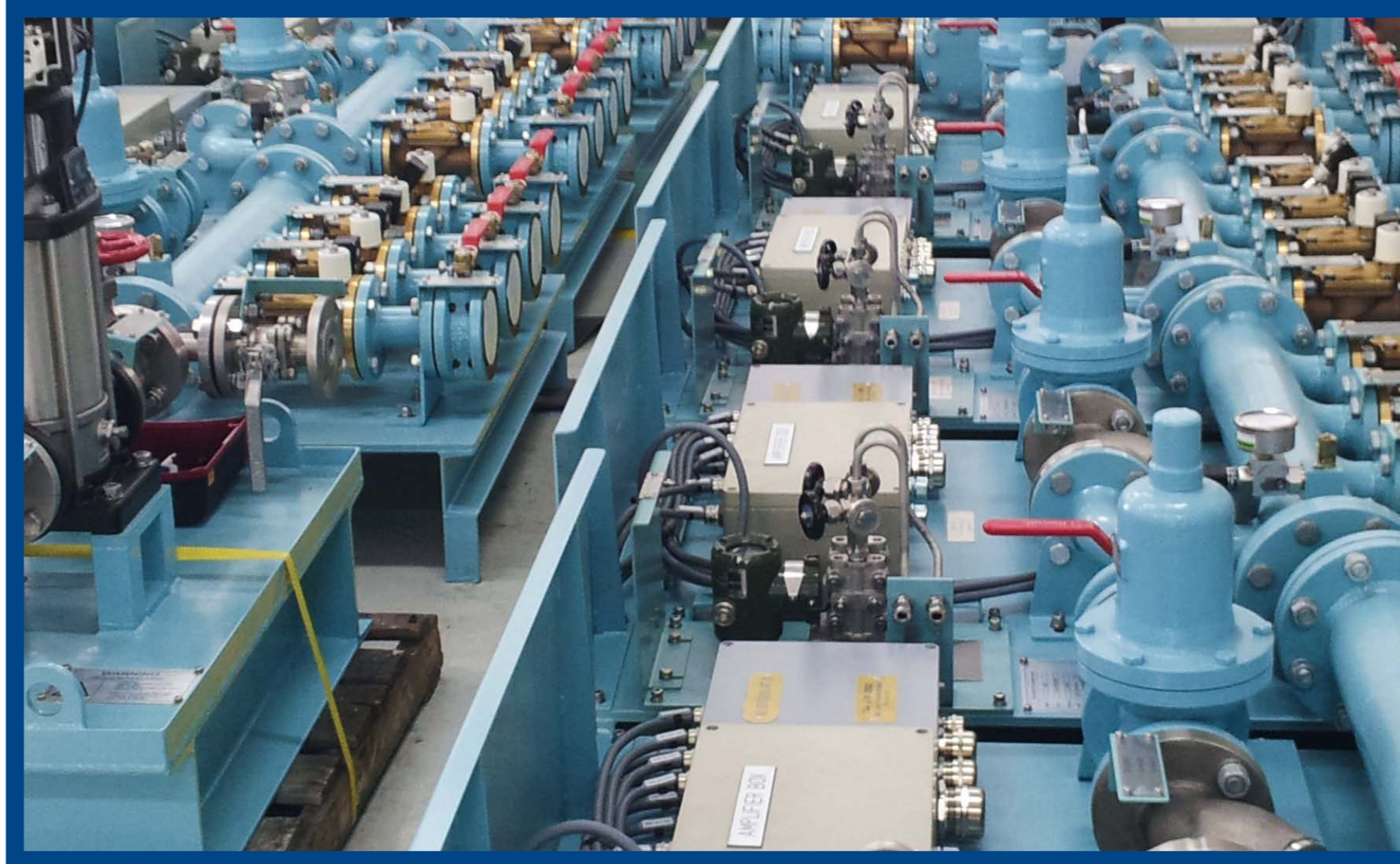


- Pneumatic fluid level measurement system based on the bubble-type principle
- Available as a separate function or in combination with the Valve Control System
- The basic function can be realized pneumatically, further options are available through an electropneumatic control cabinet

Selective Catalytic Reduction – our contribution to a cleaner environment

Special care is being taken to protect the environment from air pollution. Emerson's Aventics products contribute to fulfill the IMO MARPOL NOx regulation, which is the dominant guideline for marine industries. Stricter rules have been issued with IMO NOx Tier III.

The SCR (Selective Catalytic Reduction) principle is a technology which can reduce NOx in the exhaust gas by a chemical reaction process. The nitrogen oxides (NOx) are reduced into nitrogen (N₂) and water (H₂O) using ammonia (NH₃) or urea at a suitable temperature on the surface of the catalyst. SCR systems differ with regard to the operating temperatures and pressure in the exhaust gas line. Low- and high pressure SCR units are available to clean the exhaust gas of 2- or 4-stroke-engines.



Pneumatic units for low-pressure SCR systems:

- Compressed air preparation
- Urea supply units
- Urea dosing units
- Pump starter panel
- Soot blowing units



Pneumatic units for high-pressure SCR systems:

- Compressed air preparation
- Urea supply units
- Urea dosing units
- Urea regulating units
- Venting and sealing units



Trust is good, service is even better



For more than 80 years, the quality of our products has been undisputed in the market. The services we offer alongside our products are the decisive step toward earning your satisfaction.

Our Service Team is ready to receive your inquiries. It provides expert advice on the phone or by email and will organize on-site assistance if necessary. Or it can direct you to one of our service points all over the world.

For the operators of ships with pneumatically controlled 2-stroke-engines, we have created the PneuMare proactive maintenance concept: Supported by a vast network of service partners, it offers you continuous, worldwide support over the full operation life of the ship's engine, planned ahead whenever a ship is undergoing routine maintenance.

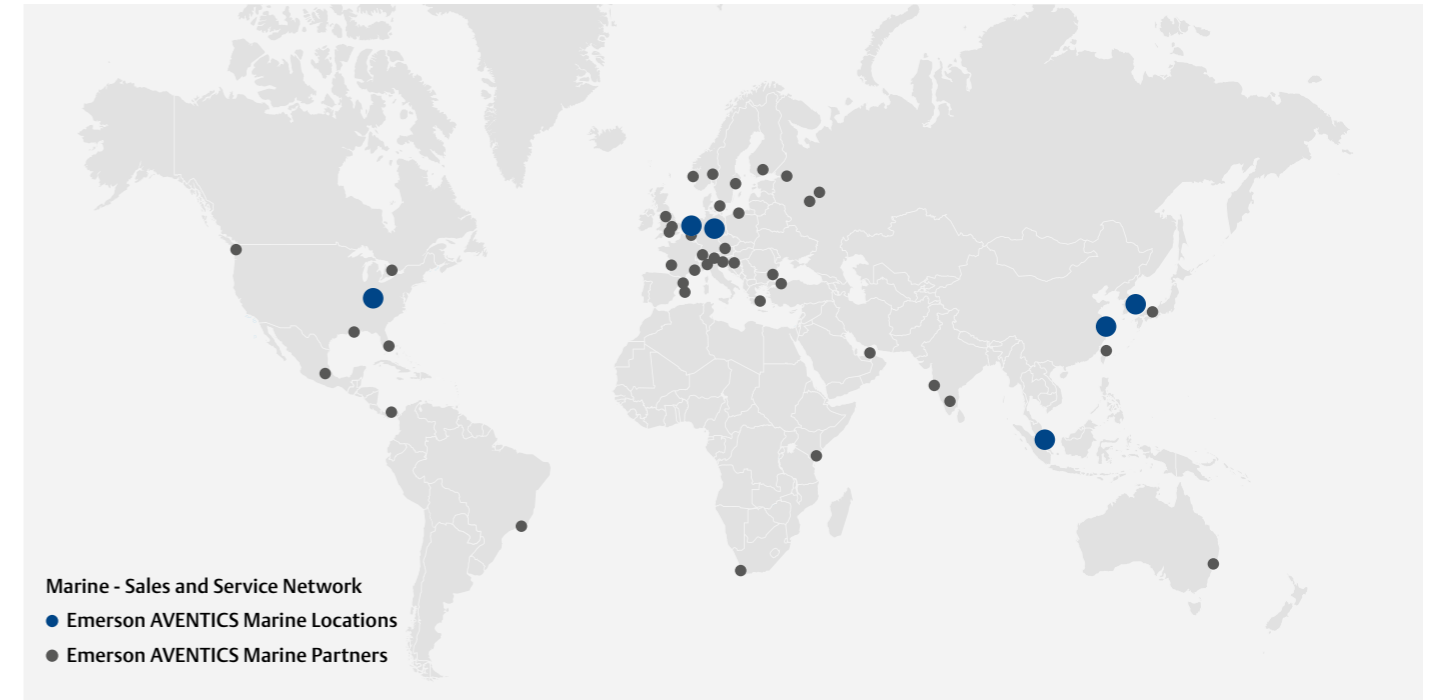
For refits or conversions of existing control systems we are by your side – from project engineering to commissioning. Take advantage of our expertise and contact us for all questions related to:

- Spare parts and maintenance
- Troubleshooting
- Repairs
- Commissioning
- Propulsion plant optimizations
- Refits and conversions

We design and manufacture in collaboration with:



Practice makes perfect



Powerful equipment offers an ocean of possibilities. At the same time, a simple question can easily take the wind out of the sails for running operations. In any case, help can be found at the Marex Academy, the training center for pneumatic and electronic applications.

How do I connect and adjust a DC servomotor? How do I address a controllable pitch propeller? How do I define an alarm point? Equipment operation, product expertise, and background knowledge are the focus of numerous training sessions that we offer to you as well as to the technicians from our service network. For you as a customer, the training sessions always address recurrent questions from real-life situations. The content is structured into modules which build on each other and are based on the latest training methods. The modules are available in several languages upon request. Catalog and training registration forms available online at www.marex-shipcontrols.com

We offer

- Individual training courses, tailored to fit your needs
- An overview of product functions
- Original components training
- Optional on-site training at your premises
- Commissioning support, including test runs
- Participant certification in after-sales expertise

Enhance commercial and recreational ship control, and increase safety, efficiency and environmental performance



AVENTICS™

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