

## Universal Assistants for Maritime Applications

### More stringent requirements for measurement technology on ships

**The water requirements on modern container ships, cargo ships, tankers, or cruise liners are so large that it is now impossible to store all the water required for the whole trip. The world's largest cruise liner can carry up to 6,800 passengers and has 23 swimming pools. Ships like this are therefore often equipped with water treatment technology like those in onshore plants.**

Evaporation technology was initially only used to produce boiler water, but is now in widespread use. Seawater is drawn in and evaporated using a negative-pressure process. The negative pressure enables the water to be evaporated at just 40 to 50 °C and the heat energy required for this process can be recovered from the waste heat of the engines. The water vapor is then condensed again and the distillate is available as purified water. Before it can be used as drinking water, the water hardness is increased and the water is sterilized using chlorination, ozonization, UV irradiation, and activated carbon filters.

### Large demand for certified measurement technology

The process of producing and monitoring the water quality requires robust, tried-and-tested measurement and control technology. By monitoring key parameters, such as the pH value, chlorine content (alternatively ozone, etc.), redox potential, electrolytic conductivity, pressure, flow, level, and temperature, a high level of water availability and the highest quality standards can be ensured at all times in the water treatment plants. When designing the technical plants and measurement technology on ships, it helps the planners and process engineers if maritime approval has been granted for the plant components. The DNV GL test seal is an important internationally recognized standard.

Devices and sensors which have been approved by the DNV GL have undergone an additional technical inspection and are subject to extra tests designed specifically for maritime applications. For example, the devices must not be disrupted by maritime radio communications. Likewise, they themselves must not disrupt the international emergency frequencies for maritime transport (156 to 165 MHz band).

The devices are subject to significantly tougher climate tests when it comes to permitted air humidity and ambient temperature. Whereas a conventional

control cabinet device for use on land is usually only designed and tested up to 50 °C, the maritime certification rules require deviations up to 65 °C or 70 °C. The devices' mechanical design is also subject to more stringent vibration and shock tests.

### **From pool control systems to the engine room**

For the first time, a modular multichannel measuring and control device designed for water quality parameters such as pH value, redox potential, conductivity, and chlorine (and other disinfection variables) has now been granted this important certification. The JUMO AQUIS touch P measuring, control, recording, and indicating device is now available with the DNV GL test seal. This means that it is ideally suited for use in the demanding water treatment plants on ships and in other maritime applications.

Typical application areas include all measuring and control points for water parameters – from seawater desalination plants to pool control systems and cooling water monitoring systems, and even boiler water measurements and ballast water disinfection systems. JUMO can also supply the high-quality sensors required for this purpose so that the entire measuring chain, including the sensor technology, is available from a single source.

Another example of a JUMO device with a DNV GL certificate is the JUMO MAERA S29 level probe. It can be used to effectively monitor the level regardless of the water quality – even in seawater thanks to its titanium housing.

Tried-and-tested RTD temperature probes, single and double surface-mounted thermostats, or precision pressure switches with "Bureau Veritas" maritime approvals are available to perform measurements in the particularly sensitive engine room.

JUMO pressure and differential pressure transmitters as well as JUMO temperature probes with DNV GL and ATEX approval are used in potentially explosive areas of gas and oil tanks. Safety temperature limiters with SIL approval complete the range.

JUMO therefore has a wide range of sensors, controllers, and measuring devices to offer for use in the maritime sector.

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