



Marine air humidification

For cruise and container ships,
yachts, naval vessels, drilling
platforms

Connected Efficiency

Solutions for marine air humidification

Challenging environmental conditions require outstanding performance and reliability

HYGROMATIK®

CAREL

Maximum flexibility or quick and easy?

It depends on your project.

HygroMatik and CAREL have a long history of providing durable offshore humidification solutions to the maritime industry. Depending on the project requirements, you can choose between the most flexible HygroMatik or

standardised CAREL solutions. HygroMatik electrode and heater humidification systems can be equipped with multiple hardware and software options to meet all application requirements, regardless of whether on

land or on water. "Made in Germany" high quality, combined with outstanding service throughout the entire product life cycle make HygroMatik products the best choice when looking for a high-end custom solution.

CAREL electrode and heater humidification systems, being IOT ready, allow our customers to remotely monitor and control unit status, ensuring service continuity. Through its global service and manufacturing network, CAREL can reach its partners wherever they need.

The best solution for your marine humidification project is sure to be available in the CAREL Group range.



Marine humidification on board - protects lives, goods and equipment

All marine humidification systems are installed on board to protect life, health, goods and sensible equipment and systems.



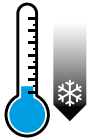
Human health above 40% humidity

In all areas where people work, sleep or travel, a minimum humidity of approx. 40% must be ensured under all circumstances, in order to protect the mucous membranes from dehydration and to prevent the spread of diseases.



Optimum conditions for moisture-sensitive goods

When storing or transporting moisture-sensitive products, the humidity conditions must be controlled to prevent them from drying out and losing quality, e.g. fruit and vegetables.



Maritime facilities located in areas around freezing point

In areas with temperatures around freezing point, the air also loses its ability to absorb moisture as the temperature decreases. Therefore, the humidity needs to be controlled permanently in sensitive areas, according to needs.



The optimum environment for sensitive electronic equipment

The right humidity level prevents sensitive navigation and measuring instruments and electronic equipment from impairments and distortion due to static discharges. A minimum humidity level reduces dust exposure and limits electrostatic charges, thus protecting against malfunctions or damage.



Wellness and spa areas at sea

Humidification with up to 100% humidity has a relaxing effect on people. Whether in the spa area of a cruise ship or an offshore oil platform, steam generators provide hygienic steam for passengers and crew members to rest and recuperate.

Container ships



Offshore installations and drilling platforms



Cruise ships



HygroMatik FlexLine services and options

Made with passion for individual and optimised solutions.

HygroMatik FlexLine Series

Perfect for marine applications.

HygroMatik electrode and heater steam humidifiers are designed for the marine engineering industry, supplied in a corrosion-resistant stainless steel housing. Additionally, they are powder-coated for greater durability. With compact dimensions, hygienic humidification is ensured with mineral-free steam in heating and ventilation systems. Developed and manufactured in Germany.

Depending on the water quality, you can choose between electrode or heater steam humidifier. Electrode units can operate on tap water or softened water, while heater units can also run

on demineralised water. All units can be further adapted to suit different water qualities. HygroMatik is available to give advice on selection and adaptations. The FlexLine units can be supplied with 200-690 V / 3 phase power supply. They ensure isolation resistance values of > 50MΩ, which is important for electrode steam humidifiers. A high performance electronic controller guarantees the fastest possible control and can be easily accessed via a touch control interface. All units are equipped with reusable cylinders that are easy to clean and service.

Heavy duty drain pumps accelerate the water blowdown process.

Excellent service

design and after-sales.

HygroMatik FlexLine units offer optimum component accessibility for easy, time-saving, environmentally-friendly and cost-effective maintenance. HygroMatik provides excellent support during the design phase, a vast product range and many options to choose from. We also offer advice and supply products and spare parts to international ports and on site.

HygroMatik service means 100% customer satisfaction!



Multiple hardware and software options	FlexLine electrode	FlexLine heater
Hardware options		
Ship installation	✓	included
HyCool	✓	✓
Dead leg flushing	✓	✓
Built-in transformer or separate control voltage	✓	✓
Relay board	✓	✓
Pressure compensation kits	✓	✓
CylinderStar	✓	✓
Software options		
Standby blowdown	✓	✓
Standby heating	✓	✓
Preventive maintenance messages	✓	✓
Built-in timer	✓	✓
Data logger and USB connection plug	✓	✓
Modbus and BACnet connectivity	✓	✓

heaterSteam - Resistive steam humidifier

The ideal humidifier for technological applications where reliability, precision and hygienic safety are vital. It can operate on drinking water or demineralised water for virtually maintenance-free operation.

- total protection against overheating;
- precision $\pm 1\%$ RH, full-range modulation;
- maximum hygiene;
- models from 2 to 80 kg/h.



The heating elements of the heaterSteam are equipped with embedded PTC sensors to protect the heaters against overheating, ensuring maximum reliability even when feedwater quality is not fully controlled. This makes of it the perfect solution for marine application. The heaterSteam ensures a $\pm 1\%$ precision in RH with its linear full-range modulation, and features a patented Anti-Foaming System that avoids the ejection of liquid droplets with steam. Furthermore, it can be equipped with a modulating limit probe to prevent any condensation downstream in the air

ducts without interruptions of the steam flow.

The heaterSteam range is available in two versions:

- **heaterSteam Process**, versatile and reliable. Equipped with corrosion-resistant Incoloy heating elements, it fits perfectly for offshore applications with no special requirement. All basic functions are integrated.
- **heaterSteam Titanium**, the mission-critical solution. Equipped with unique Titanium heaters, is the ideal solution when the continuity of operation is crucial. The unit can operate on any type of treated water, even extremely aggressive with a conductivity below $1 \mu\text{S/cm}$ and softened down to 0°fH . Its sophisticated control with colour touch-screen allows for easy access and monitoring of all the functions, humidity diagrams, alarm history, integration in BMS networks with the embedded protocols Modbus[®], BACnet[™] and others, on serial or Ethernet port. It supports multi-humidifier configurations in redundancy or rotation mode, as well as wireless sensors for easy installation.

heaterSteam UR technical specifications

Type	UR002	UR004	UR006	UR010	UR013	UR020	UR027	UR040	UR053	UR060	UR080
Steam output [kg/h]	2	4	6	10	13	20	27	40	53	60	80
Rated power [kW]	1.5	3.0	4.5	7.5	9.75	15.0	20.25	30.0	39.75	45.0	60.0
Electrical connection											
208-240V 50-60Hz single phase or two phase	●	●									
208-240 V 50-60 Hz three phase	●	●									
380-415 V 50-60 Hz three phase			●	●	●	●					
440-480 V 50-60 Hz three phase			●	●	●	●	●	●	●	●	●
575-600 V 50-60 Hz three phase			●	●	●	●	●	●	●	●	●
660-690 V 50-60 Hz three phase			●	●	●	●	●	●	●	●	●
690 V 50-60 Hz three phase*						●	●	●	●	●	●

* Not available as heaterSteam titanium

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