



**KLH marine**

HVAC Division of R&M Group



Perfect climate on board

**HVAC Solutions**

## Simply feeling good

# Our priority



Pleasant and healthy indoor air quality on board is essential for both passengers and crew members as well as for the malfunction-free operation of machines, systems, and equipment. Whether it is a working or passenger ship, engine room or cabin – KLH Marine offers the right solution for an optimal climate.

Generation and maintenance of the ideal temperature, humidity and air purity is only possible through the use of innovative heating, ventilation and air-conditioning systems (HVAC). KLH Marine leaves nothing to chance in the area of climate. As a competent partner, we develop efficient and energy-saving concepts, taking into account the latest quality management systems, ISO 9001 and are available to our customers from project planning right through project completion and after-sales service.

From special individual solutions to an optimized turnkey project – at KLH Marine, every customer receives the concept appropriate to its requirements.

### Our competencies

- Concept development/System design
- Space investigations for AC rooms and trunks
- Transmission and CO<sub>2</sub>-calculations
- Detailed Designs of AC rooms and trunks
- Creation of part lists and installation drawings
- Purchasing and installation of all necessary components
- Development and delivery of system automation
- Commissioning and hand over of the systems
- Crew training
- Maintenance and after-sales service worldwide
- Project management



## Absolutely reliable

# Our implementation

Our experienced team of experts is able to offer tailor-made air-conditioning and ventilation systems according to individual customer needs. We examine all options and implement the most efficient and sustainable solutions.

### Basic design

Transmission calculation, preparation of an air balance plan and a list of fittings based on the general and partitions plan and the technical specifications.

### Detailed design

#### ■ Preparation of single line drawings (SLD)

Showing the duct and pipe routing including dimensions. Dampers, silencers, penetrations, fans, and air handling units (AHU's) are also indicated in the SLD.

#### ■ Coordination work inside AC rooms and trunks

Drafting, design, and 3D visualization of the AC rooms and trunks, as well as the full air conditioning and ventilation system upon request.

#### ■ Technical planning

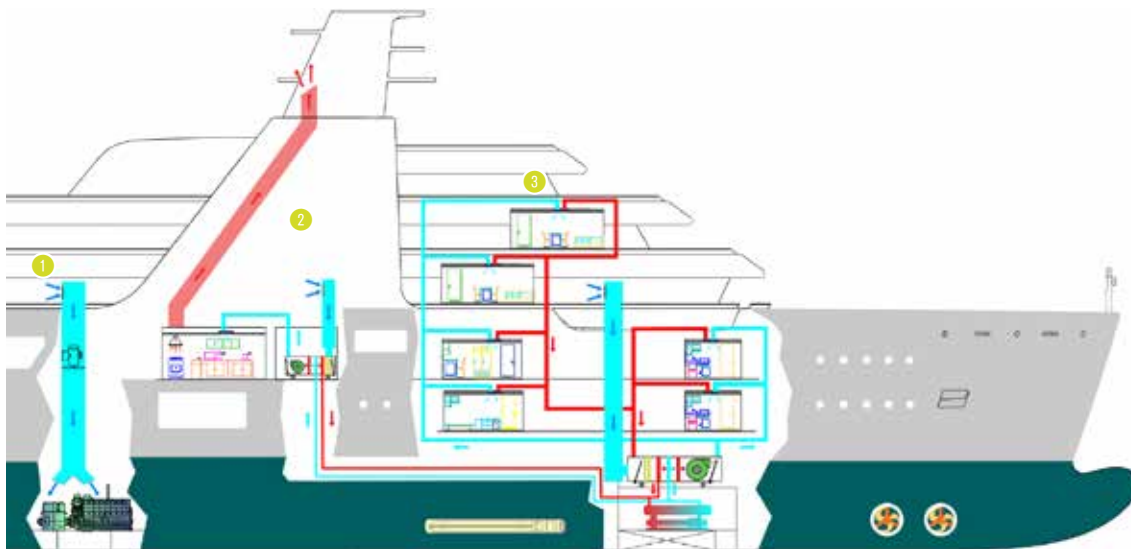
Preparation of workshop and assembly plans as well as parts lists

### Building Period

Delivery and installation of all necessary air conditioners, fans, pipes, ducts, control cabinets, water chillers, penetrations, insulation, and dampers.

### Commissioning

Calibration of the air volume using state-of-the-art measuring and control technology, programming the system controls and handover of the systems to the owner/shipyard.



**1 Engine room:** Outside air is supplied through the blue shaft by large fans into the engine room and flows regularly due to overpressure in a natural way through the chimney outside.

**2 Galley:** This area on board is supplied with treated air, which means that the air will be cooled or heated, depending on the outside temperature. The partly greasy exhaust air is directly transported to the outside.

**3 Passenger and crew areas:** The chiller units are located in the lower part of the vessel. Chiller units supply air handling units (AHU's) inside the AC rooms with cold water, which is required to cool the air. The outside air is processed (cooled, heated, and moistened) in the AHU's. The treated air is directed into the affected areas via a duct system. In order to avoid an overpressure in the supplied areas, different exhaust air systems permanently suck in the "excessed air", whereby a large part of the energy of this air is reused by heat recovery.

## Always far-sighted

# Our service

Even after a project has been completed, we do not leave our customers on their own. We take care of our customers worldwide in regard to maintenance and repairs, which can be as part of fleet or maintenance contracts.

## Mittelpunkt Mensch

## Comfort and safety on board



The R&M Group is one of the world's leading suppliers of customized turnkey solutions for interior outfitting of ships and maritime facilities. The wide-ranging portfolio covers all aspects of the value chain, including engineering, consulting, design, planning, and installation for new builds, conversions, and repairs.

Whether crew or passenger areas, our services include thermal and acoustic insulation, fire prevention, climate control, and ventilation technology, the insulation, and installation of pipe conduits along with the production and installation of interior systems such as

bulkheads and ceilings, decks and doors, cabins, wet units, and furnishings.

After the takeover of the KLH Group's ship segment in mid-2016, the HVAC expertise has been bundled under the brand name KLH Marine and the HVAC Division of the R&M Group has been fully established.

We will work on the best solution for you and assist you with the implementation.

R&M Group

[hvac@rm-group.com](mailto:hvac@rm-group.com)  
[www.rm-group.com](http://www.rm-group.com)



**Rheinhold & Mahla**

Since 1887