

# Halton Marine

– Providing individual cabin ventilation



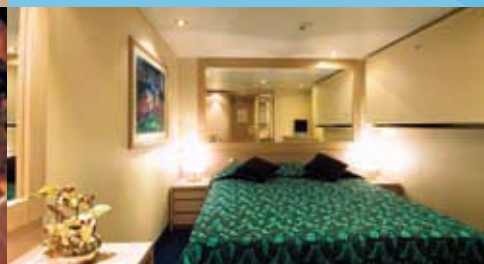




# Providing individual cabin comfort

**Welcome aboard with Halton Marine,** the world's leading suppliers of marine HVAC systems. We're delighted to present the Halton Marine cabin ventilation solution that guarantees ultimate air-comfort technology.

Air comfort is one of the most important factors in creating a successful work environment and in arranging a dream vacation aboard ship. Silent, user-friendly, and individual cabin ventilation technology creates a relaxing atmosphere for different types of cabins and environments using a modern, pressure independent operating system. You can choose from a wide range of solutions to supply crew, passenger, or deluxe cabins with the best marine air technology.



# Better business from enjoyable indoor air

**Unpleasant indoor air quality** can cause various symptoms; itchy and dry skin, cough, throat irritation, stuffy and runny nose, eye irritation, headache, allergy, asthma etc. They all cause discomfort which can easily spoil a dream vacation or an efficient workday.

At Halton Marine, we want to offer our customers a choice for better indoor air quality.

Everything starts with a good design; matching the best suitable products for different types of cabins. In the design phase Halton Marine offers a unique possibility to test and verify a wide range of air conditioning solutions for cabins.

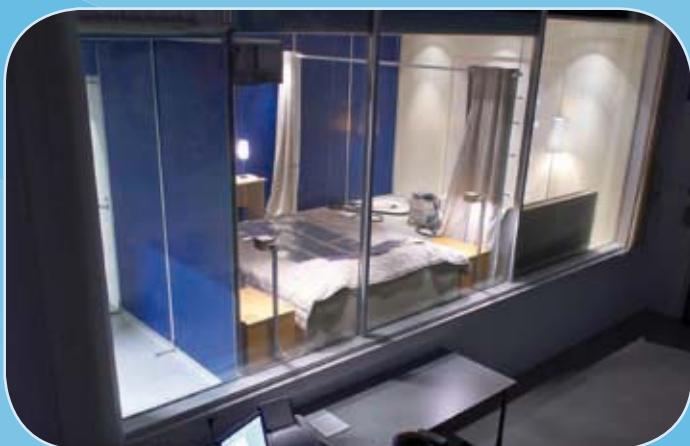


Comfortable thermal conditions are always an individual experience. Halton Marine pressure independent operation system ensures that indoor climate in cabins can be individually adjusted according to passenger demands. In a case where a passenger informs the crew that the thermal environment in his cabin has changed or is otherwise at an uncomfortable level, it is possible to trace the history of each cabin on the PC in the reception area, and even make the necessary adjustments without entering the cabin. This requires that the cabins are connected to a network.

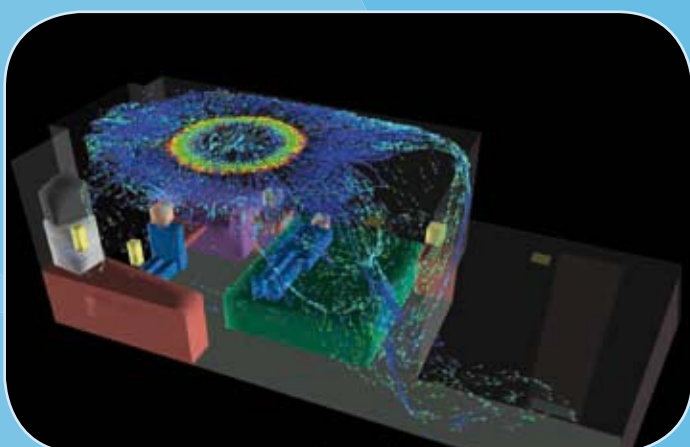
For special cabins such as cabins for highly allergic people Halton Marine offers high efficiency air filters, which are capable of removing both particulate and gaseous contaminants from the supply air.



Halton Marine SEAVIEW. Corridor to two cruise ship cabins.



Halton has several measurement laboratories.



CFD simulation services - available through Halton Marine.

# A good design makes a huge difference

**Halton Marine offers** several options to test and verify different types of air-conditioning solutions.

Halton SEAVIEW with two cruise ship cabins and connecting corridor is a complete HVAC installation with an extensive range of air-conditioning solutions and measurement devices. The installation consists of a fully automatic monitoring system for energy consumption, comfort, and safety by continuous measurement. Different types of terminal units, supply and exhaust products are integrated into the cabin architecture. Remote control and monitoring of cabin air-conditioning operates on both; a LON or Ethernet network.

One of the Halton measurement laboratories is located next to SEAVIEW. The laboratory is an ideal place for sound generation and attenuation measurements as well as for air velocity and temperature measurements. It is possible to build a mock-up inside a velocity laboratory to test integration and functionality of different solutions in order to find the most comfortable conditions.

In a case where a customer finds the experiment difficult to set up, Halton Marine offers also computational fluid dynamics (CFD) simulation services for optimizing the ventilation system functions. With CFD it is possible to simulate heat transfer, temperatures, velocities, and to verify the comfort in the room. At Halton, CFD simulations can be validated against laboratory measurements.





# Halton Marine cabin ventilation

## **The Halton Marine cabin ventilation solution**

is a total cabin air-condition package. The package includes a cabin unit with plug-and-play connections, an intelligent room control panel, interconnection cable plus supply and exhaust products. Cabin units can operate as stand-alone units, in series or can be connected to a network controlled by special software.

The Halton Marine cabin ventilation solution consists of numerous individual products that can be used separately or together to build a customized cabin ventilation solution. However, to make it easier for you, we have also divided solutions into three different operation systems to which you can easily add the products that fit to your customers' image and needs.

## **Pressure independent operation system – For advanced indoor climate conditions**

Halton pressure-independent cabin units offer the most sophisticated indoor air-quality for cabins. The airflow is controlled and maintained individually in each cabin and thus sound levels remain constant. Changes in supply air are so smooth that passengers won't pay any attention to ventilation. For safety reasons, the airflow and temperature are continuously measured so that the controller will cut off the reheat power below the minimum airflow.



Halton Marine cabin ventilation equipment can operate on a LON or Ethernet network. Through intelligent network and pressure-independent operation systems it is possible to reach the best benefits of the Halton Energy Saving Concept. Automatic models of HMF (single duct cabin unit), HVB (vertical, single duct cabin unit) and HMR (dual duct cabin unit) are typically used in passenger cabins or other similar accommodations. For suites, deluxe cabins or other larger spaces Halton Marine recommends fully automatic HFR/M multi-connection cabin unit in which the total airflow is distributed from multiple points and is centrally controlled by one room thermostat. For ultimate cabin comfort we recommend using the HME sound attenuator and balancing box together with HFR/M.



### Pressure dependent operation system

#### – For good indoor climate conditions

Cabin units operating in pressure dependent operation system are a choice for achieving good standard indoor climate conditions in cabins. Pressure dependent cabin units do not include continuous airflow measurement feature. Halton Marine semi-automatic HMF (single duct cabin unit) and HVB (vertical, single duct cabin unit) consists of a reheater, a control unit and an actuator. Halton semi-automatic models are typically used in passenger cabins.

As an initial investment, the pressure dependent semi-automatic cabin unit can be more economical choice than the automatic cabin units. However, as a long-term investment the benefits of utilizing the Halton Marine Energy Saving Concept are not as significant as when cabin units are operating in a pressure independent operation system.

### Manual operation system

#### – For basic indoor climate conditions

Halton manual cabin units operate always in pressure dependent operation system. The Halton HMM cabin units that are typically used in crew and officer cabins can include reheater and control unit (semi-automatic model) or just a manual damper (manual model) which both allow the manual adjustment of airflow quantity. The manual operation system is typically used for basic indoor climate conditions.



### Choose diffusers and thermostats according to your needs and decor

The Halton Marine cabin ventilation solution also includes a wide selection of diffusers and room thermostats. Visible parts of the system can be selected to match the cabin's overall decor and the needs of the end user.

>>> network options



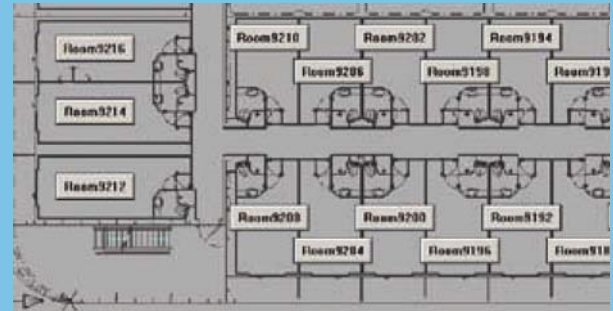
# Intelligent network aboard ships

## Connecting a Halton cabin ventilation system to a network offers many advantages:

- A possibility to control, monitor and adjust cabin indoor climate centralized via network
- Improved passenger comfort
- Savings in troubleshooting time
- Savings in energy consumption

In a network, selected cabin ventilation parameters can be managed through PC software or locally by using a Palm hand-held or a laptop computer. The network also enables optimization and balancing of the cabin ventilation system.

Halton pressure-independent operation system working in a network ensures that indoor climate in cabins can be individually adjusted according to passenger demands. In a case where a passenger informs the crew that the thermal environment in his cabin has changed or is otherwise at an uncomfortable level, it is possible to trace the history of each cabin on the PC in the reception area, and even make the necessary adjustments without entering the cabin.



## Saving in energy consumption

One of the best benefits from the ship owner's point of view is the active operation between AHU (Air Handling Unit) and cabin units. Data from cabin units is collected and calculated to control the AHU. Data of requested airflows and temperatures, fine-tune the air handling unit operation. Therefore the unnecessary operation of AHU is minimized resulting in savings in energy consumption.



# >>> options according needs

## LON and Ethernet networks

### – For new-buildings and refurbishments

Halton Marine offers two different cabin ventilation network systems: LON and Ethernet. Halton's new network adapters are available for new-buildings as well as for refurbishments. Cabin ventilation products operating as stand-alone are easy to connect to a network simply by adding a LON or Ethernet network adapter.

**LON** network is one choice to build Halton Marine centralized cabin ventilation system. Network is normally built by ventilation systems, combining cabin units of each system together. By using LON routers these groups are connected to the centralized supervision system operating in PC software. Communication after routers can be also managed in an Ethernet network. An automatic Halton Marine LON node replacement software, running on supervision PC, enables easy maintenance of the LON network.



**Ethernet** network is another choice to build Halton Marine centralized cabin ventilation system.

In principle the operations are the same in the both networks. In a LON network, nodes are used for parameter identification as in Ethernet network, where IP-addresses are used for the same thing. Nodes and IP-addresses can contain multiple exchangeable/readable parameters for setting and monitoring cabin climate conditions. IP-addresses for cabin units connected to a network are set by hand held tool or laptop. PC supervision software enables easy maintenance of the network.

Halton Ethernet solution can be embedded to an existing Ethernet network built on board, which is normally used for other services such as IP-telephone, Internet, multimedia, IP-television etc.





# Cost efficient commissioning

Installation, wiring and system balancing together with product quality are the vital parts of cost efficient commissioning and on-board start-up. Compared to traditional systems, Halton offers a possibility for shipyards to cut commissioning time and costs as airflows, temperature set-points and heating power can be set and programmed according to customers needs on site or at the Halton Marine factory.

A self-diagnostic function built into the thermostat detects possible problems without having to open the ceiling.



Status		ACTUAL		MANUAL PERFORMANCE	
<b>ALARM/STATUS</b>					
Flow Ref	000.00%	Flow Actual	0.00%	Flow Ref	0.00%
Control Ref	0.00%	Control Actual	0.00%	Control Ref	0.00%
Pressure Ref	0.00%	Pressure Actual	0.00%	Pressure Ref	0.00%
Temp Ref	0.00%	Temp Actual	0.00%	Temp Ref	0.00%
<b>MANUAL TEST</b>					
Flow Ref	0.00%	Flow Actual	0.00%	Flow Ref	0.00%
Control Ref	0.00%	Control Actual	0.00%	Control Ref	0.00%
Pressure Ref	0.00%	Pressure Actual	0.00%	Pressure Ref	0.00%
Temp Ref	0.00%	Temp Actual	0.00%	Temp Ref	0.00%
<b>STATUS</b>					
Flow Ref	0.00%	Flow Actual	0.00%	Flow Ref	0.00%
Control Ref	0.00%	Control Actual	0.00%	Control Ref	0.00%
Pressure Ref	0.00%	Pressure Actual	0.00%	Pressure Ref	0.00%
Temp Ref	0.00%	Temp Actual	0.00%	Temp Ref	0.00%
<b>SETTINGS</b>					
Flow Ref	0.00%	Flow Actual	0.00%	Flow Ref	0.00%
Control Ref	0.00%	Control Actual	0.00%	Control Ref	0.00%
Pressure Ref	0.00%	Pressure Actual	0.00%	Pressure Ref	0.00%
Temp Ref	0.00%	Temp Actual	0.00%	Temp Ref	0.00%

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Halton Marine's website is a source for product, system and application information. With its comprehensive data, news and eServices the website is always at your service.



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## HALTON MARINE CABIN VENTILATION

### **HMF single-duct cabin unit**

Automatic cabin unit with pressure independent or dependent operation system.

### **HVB vertical, single-duct cabin unit**

Automatic cabin unit with pressure independent or dependent operation system.

### **HMR dual-duct cabin unit**

Automatic cabin unit with pressure independent operation system.

### **HFR/M multi-connection cabin unit**

Automatic cabin unit with pressure independent or dependent operation system.

### **HME sound attenuator and balancing box**

Easily adjustable sound attenuator and balancing box for supply or exhaust.

### **HMM single-duct cabin unit**

Manual cabin unit. Electric reheater with advanced controller available as an option.

### **HMC single-duct cabin unit**

Manual cabin unit. Recommended to be used with Halton's TCL diffuser.

### **HML airflow unit for large air volumes**

Airflow unit with centralized airflow heating

### **LON / ETHERNET network options**

Network options to build an energy-efficient and comfortable air-conditioning solution on board.

### **Network supervision software**

To manage, control and adjust cabin indoor climate conditions via network.

### **Control panels**

A wide selection of room control panels with different designs.

### **DLO, TDM, TBM diffusers**

Different types of diffusers according to customers needs. Architectural, perforated and solid models available.

### **Exhaust products**

A wide range of grilles and valves available.

### **Ask for more:**

Halton Marine is constantly developing its range of products and solutions. Contact nearest Halton Marine Sales office to learn how we can help you to improve the profitability of your business.