Improve air quality onboard ships with ABB air filtration solution

- Protecting ship passengers and crew
- Prevent spread of contamination
- Turnkey solution with reliable ABB equipment
Increase passenger safety onboard with the air cleaning solution by ABB

Maintenance of HVAC (Heating, Ventilation, Air Conditioning) systems are easily neglected onboard ships, due to non-critical system for operations. However, passengers are paying more attention to overall safety and clean environment. With this in mind, all measures should be taken to prevent spread of contamination and keeping the air as clean as possible.

ABB offers a turnkey solution for improving air quality on ships with a solution that integrates HEPA filters (high efficiency particulate air-filter) to the HVAC systems onboard in a controlled way to avoid pressure drops and to maintain energy efficiency.

Basic HVAC System design
The HVAC system flows warm, cool or dehumidified air through the ducts into the ship. HVAC is basically climate control of confined space with respect to requirements of persons in it; nevertheless HVAC system is not only heating and cooling of air but also concerned with maintaining the indoor air quality (IAQ) and remove polluting.

Equipment for the air treatment and distribution are the Air Handling Units (AHU) serving cabins, public areas and utilities rooms. The AHUs are often designed to recirculate most of the air from the spaces or to recover the thermal energy from the exhaust air: in this way energy can be saved, electrical load is reduced and the size of HVAC system can be optimized.

HVAC in Passenger ships
Cruise and ferry companies have a target of keeping passengers and clients happy and satisfied, but above all healthy and safe. Passengers spend most of their time onboard enjoying the ship’s facilities, e.g. restaurants, cafes, theatre, disco, fitness areas, and any issue concerning air quality becomes fundamental for passengers’ health and obviously for the crew.

ABB has developed a solution for HVAC air filtration that allows capturing airborne particles with HEPA filters to protect ship passengers and crew from their harmful effects. Cruise and ferry ships are usually fitted with standard HVAC air filters that are not able to filter small particles like viruses or other small contaminants.

HEPA filters are used by many industries and facilities around the world to ensure air is filtered properly and indoor air quality is constantly kept at the maximum level: examples are pharmaceutical laboratories, hospitals and nuclear plants. There are a lot of cases of ships where the air filtration has been neglected and the disease proliferated inside the ship.
HEPA filters can keep passengers safe as well as contribute to preventing the spread of diseases and pandemics through the air conditioning system.

**Improving safety on HVAC system**
Improving air filtration of HVAC System can minimize the spread of contamination. HEPA filters have been proven over decades across a wide range of healthcare facilities and life sciences applications, controlling the spread of airborne particles and organisms such as viruses and bacteria.

The efficiency of HEPA filters is measured at MPPS (most penetrating particle size) that means this is the lowest efficiency of the filter. For smaller or larger particles that filter will perform even better. MPPS is typically between 0,1÷0,2 micrometer in size. Bacteria and viruses are often smaller than that but typically attach themselves to larger particles.

**Installation of HEPA filters**
Canister housings for duct installation are specifically designed to guarantee a perfect filter housing seal, no leakage and an easy frontal change of the filter by means of plastic barrier-bags that ensures safe conditions when used in contaminated HVAC air systems.

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Typical installation on passenger vessel, Air Handling Unit with recirculation

### HEPA filters:

<table>
<thead>
<tr>
<th>HEPA class</th>
<th>Retention (averaged)</th>
<th>Retention (spot)</th>
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<tbody>
<tr>
<td>E10</td>
<td>&gt; 85%</td>
<td>-</td>
</tr>
<tr>
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<td>U15</td>
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</tr>
<tr>
<td>U16</td>
<td>&gt; 99.999995%</td>
<td>&gt; 99.9999%</td>
</tr>
</tbody>
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Canisters are suitable to insert HEPA filters and associated pre-filters with international standard dimensions.

Canisters are usually used in pharmaceutical facilities, bacteriological laboratories and nuclear plants.
Canister with ABB Technology
Canisters are tailor made designed by ABB with integrated control system and where necessary with air booster blower. Air flow range is from 3,400 to 68,000 m³/h.

Canisters for Marine HVAC application are equipped with:
• Control and electrical panel
• AC500 PLC with HMI
• Differential pressure transmitter for filter status
• Booster fan and ACS880 Frequency Drive
• Inlet-outlet actuated air dampers for by-pass
• Integration with existing HVAC control system for remote monitoring and alarm

Customer benefits
• Turnkey solution with mechanical and electrical control system
• Reliable solution cleaning the air onboard ships
• Easy installation with ABB equipment
• ABB Global Technical Support available 24/7