



## Press Release

### Tough requirements for air conditioning

## EC fans on the high seas

**When Royal Caribbean International ordered “Quantum of the Seas”, one of its most stringent requirements was: 20 percent less energy consumption than the precursor ship. Installing EC fans from ebm-papst was enough to achieve that ambitious energy-saving target for the air conditioning. The fans also make very little noise, fulfilling passenger needs for quiet.**

### Perfect air conditioning in every climate zone

The luxury liner belonging to Royal Caribbean International is 350 meters long and 41 meters wide. It can accommodate 4,180 passengers seeking an exclusive vacation experience. They expect the air in all interior spaces to be at just the right temperature, no matter what climate zone the ship happens to be in. Each cabin has its own air conditioning, with which passengers can set the temperature they prefer. Many of the ship's rooms are in the interior or have windows that cannot be opened. Air exchange in most parts of the ship takes place only in the ventilation system.

### Nearly 3,000 fans installed

Limited space is a big challenge for shipboard air conditioning, so the ventilation equipment has to take up as little space as possible – one of the reasons why powerful ebm-papst EC centrifugal blowers with forward-curved blades are installed in the cabin air conditioners. RadiPac series EC centrifugal fans with backward-curved blades are installed in the public areas. All told, 2,956 fans ensure a pleasant climate on-board.

### Active PFC reduces harmonics

When so many EC fans are connected in parallel to a single generator and a single power network, so-called harmonics can arise: EC fans receive pulsed input current, so with a sinusoidal AC supply, phase-shifted rather than sinusoidal input currents result. To counter this, ebm-papst has added an active harmonic filter to the fan's electronics: active PFC (power factor correction). With active PFC installed, a power factor of nearly one is reached, satisfying the requirements of the EN 61000-3-2 standard without the need for additional measures. Active PFC technology allows the design of a smaller generator from the beginning, since a lower peak load can be assumed. That saves money, weight and space.

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Fig. 1: Swimming pool, cabin, Royal Esplanade or spa – EC fans ensure a pleasant climate on the high seas.



Fig. 2: In shipbuilding, every cubic centimeter counts. In RadiPac EC fans, the high-performance impeller is directly attached to the rotor of the external rotor motor, making the system extremely compact.

Fig. 1: Royal Caribbean International  
Fig. 2: ebm-papst  
Characters: approx. 2.500, with headline and sub-heads  
Keywords: EC technology, centrifugal fan  
Tags: EC fans, energy savings, centrifugal fan, RadiPac, Active PFC, cruise, air conditioning  
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#### **About ebm-papst**

The ebm-papst Group is the world's leading manufacturer of fans and motors. Since it was founded, the technology company has continuously set global market standards.

Developments have ranged from electronically controlled EC fans, through aerodynamic improvements of fan blades, and on to the resource-conserving selection of materials, with sustainable materials being just one option.

In fiscal year 2015/16, the company achieved sales of almost €1.7 billion. ebm-papst employs approximately 12,500 people at 18 production sites (in Germany, China, the United States and elsewhere) and in 57 sales offices worldwide. Fans and motors from the global market leader can be found in many industries, including ventilation, air conditioning and refrigeration, household appliances, heating, automobiles and drive engineering.

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