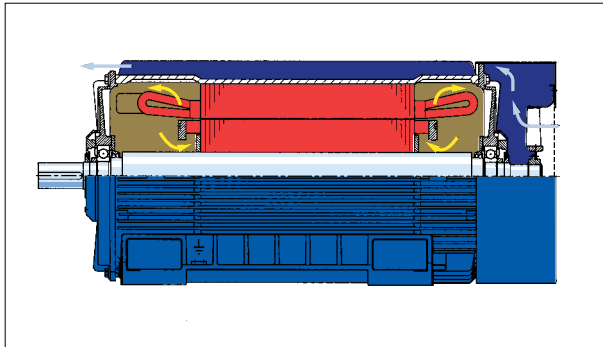


# Noise and ventilation

## Ventilation system

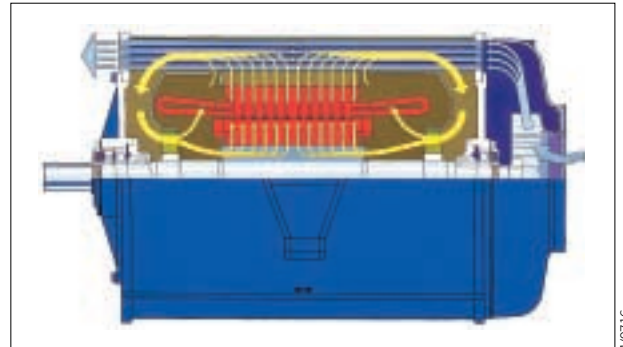
**Rib-cooled design:** The ventilation system is characterized by the shape of the fan, the fan cowl and the arrangement of the cooling ribs.

The uni-directional external fan is arranged at the N-end. To ensure a forced internal air circulation, vans are provided on the short-circuiting rings.



**Tube-cooled design:** Tubes, concentrically arranged around the active part, act as air/air heat exchangers.

The internal air flow through axial air ducts in the shaft and radial air ducts in the active part ensures a near uniform temperature distribution in the motor.

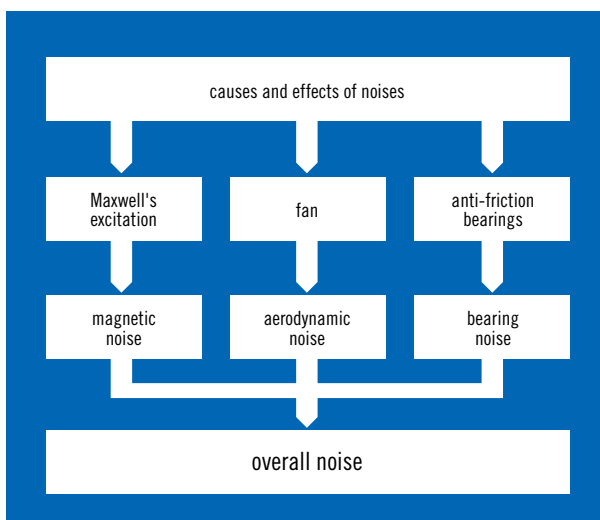


## Noise

In view of ever more stringent regulations concerning protection of the environment and safety at work, keeping the noise generated by electrical machines as low as possible is of particular importance.

**From the outset, i.e. including the basic design, our machines are designed as low-noise machines. This is achieved by an interactive design of all important system components:**

- Frame
- Ventilation system
- Electro-magnetic design
- Bearings



Sources of noise in electrical machines

## Noise reduction

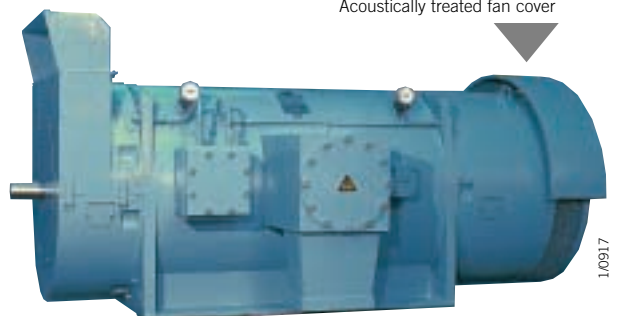
Where extreme noise requirements are to be met, various tailor-made solutions are available.

Rib-cooled machines are provided with an acoustically treated frame mantle.

With tube-cooled machines, depending on the number of poles and the overall machine design, acoustically treated absorbers for air inlet and outlet and/or an acoustically treated frame mantle are used. Combined, these measures can offer noise reductions of up to 12 dB.



Acoustically treated fan cover



Motor with air outlet absorber and acoustically treated frame mantle