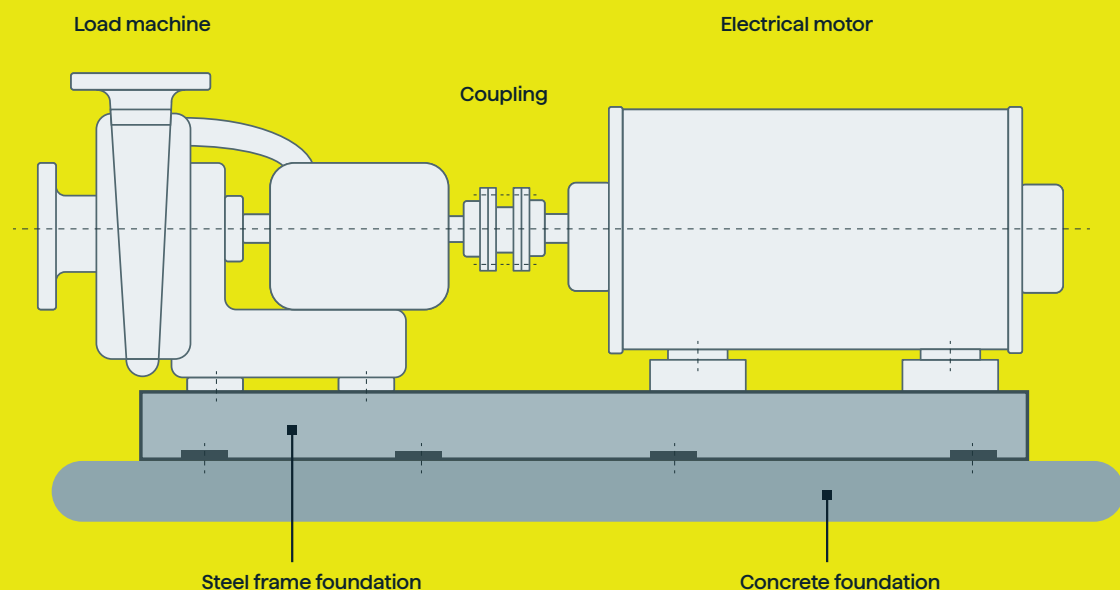


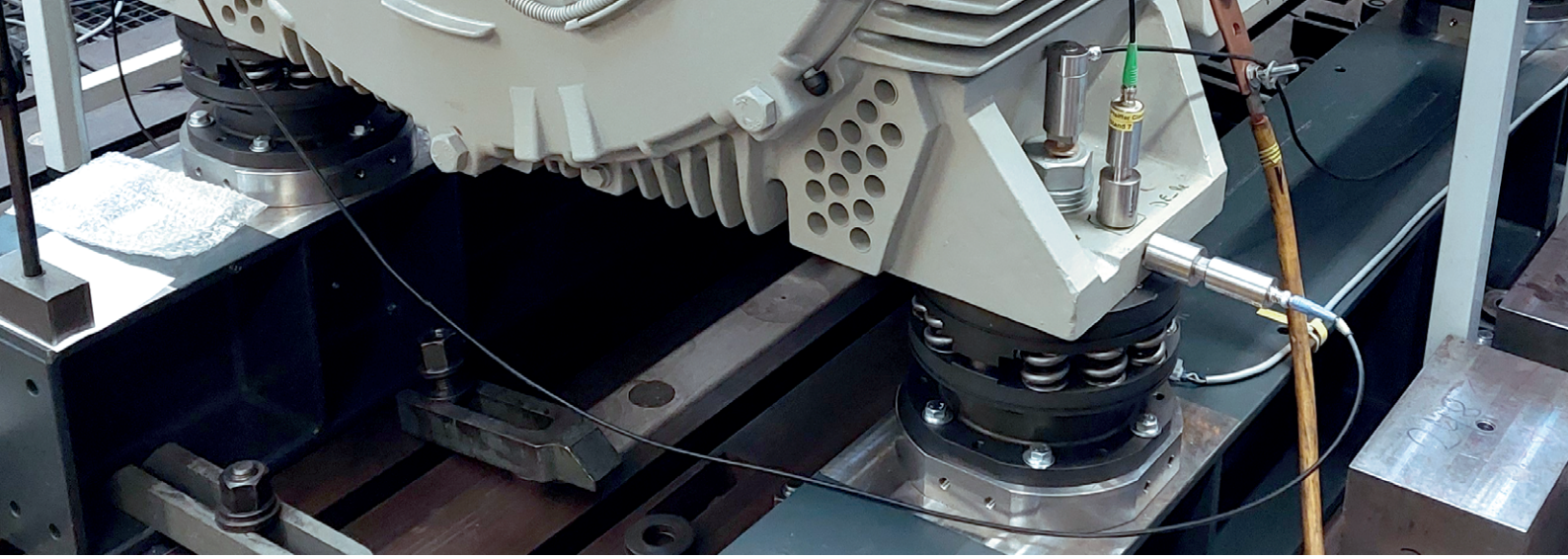
We improve your large electric motors' performance.

Active vibration control of electric motors

The issue

Large electric motors are designed mostly for installation on massive foundations, according to international standards and customer specifications. Usually, the electric motor is operated coupled with the load machine on a common steel frame foundation. However, a steel frame foundation changes the natural frequencies and resonances of the motor. A new system is generated – “motor on steel frame foundation” – with a completely new vibration behaviour. The consequences: High vibrations on the plant due to resonances in the operation speed range may occur, leading to trouble shooting (with e.g. changes in foundation and motor design, or acceptance of restricted speed ranges in the operational speed range).





The solution: Active Vibration Control System (AVCS)

Actuator systems are positioned between motor feet and steel frame foundation.

The whole motor weight is carried by the springs of the actuator systems.

By using a specially developed actuator configuration, all rigid body modes can now be influenced by AVCS. Each active actuator system has an electrodynamic actuator, which is operated current-controlled, and has to compensate only the dynamic movement of the motor foot, no static forces. The vertical vibration velocities of the motor feet are lead back to separate controllers. By using PI-controllers in combination with velocity feedback of the motor feet vibrations, the system stiffness and system damping can be optimized for each rotor speed (simplified consideration):

The most important benefit:

With the developed Active Vibration Control System (AVCS) the motor can be actively decoupled from the steel frame foundation and restrictive speed ranges in the operating speed range can be avoided.

Motor runs on any foundation

Future aspect:

The intelligent motor system of the future chooses the necessary system stiffness and system damping for each rotor speed by optimizing the control parameters itself, using AI (Artificial Intelligence).

Intelligent motor system creates its own foundation for any rotor speed