

Modern energy production!

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The future of electricity and heat generation lies in renewable energy. Biogas and biodiesel present sustainable alternatives to increasingly scarce and expensive natural resources such as oil, gas and coal. Combined power and heat cogeneration units are a particularly efficient modern means of producing energy. They not only supply electricity, but also transform the resulting waste heat into usable heat. And mounting elements from Angst + Pfister ensure that they operate silently and practically vibration-free.

As an environmentally aware company, the Angst+Pfister Group is addressing the issue of renewable energy. Our high-grade components can be found, for example, in the combined power and heat cogeneration units manufactured by SEVA Energie AG. Powered by gas and diesel motors, a cogeneration unit produces electricity in an initial step, with an efficiency factor of between 35% and 45% achievable depending on the size of the unit. At the same time, the resulting waste heat is either used directly onsite or is fed into a local heat distribution grid. This way, the entire efficiency factor increases to between 80% and 95% of the primary energy. As a specialist in antivibration technology, Angst+Pfister uses its experience and know-how along with a forward-looking product

line to support innovative companies in optimizing their solutions, for example when minimizing undesired motor vibration is the task at hand.

Effective uncoupling

When a cogeneration unit is in operation, the gas or diesel motor produces vibrations. These can affect people or sensitive equipment in the immediate area through transmitted structure-borne noise or secondary airborne sound. Elastic uncoupling of the motor or generator from its surroundings can effectively reduce the transmitted vibrations. To achieve this, elastic mounts are attached directly beneath the motor/generator. Secondly, the entire cogeneration unit is mounted on elastic machine mounts (gray supports), however,

because the installation of two springs creates a "dual-mass vibrator" from a physics standpoint. If the spring elements are not optimally harmonized, the effectiveness of the isolation gets drastically reduced. In the worst case, this could result in even more vibrations than before.

Customized mounting systems

The interdependence of the individual springs in an antivibration system is illustrated in the diagrams below, which compare a single-mass vibrator with a dual-mass vibrator. The enlargement function reflects the relationship between the input and output amplitude. If the gas or diesel motor is running at 1,500 revolutions per minute, that equates to an excitation frequency of 25 Hz. If the single-mass vibrator is

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A biogas plant produces biogas through fermentation of biomass.

set to a natural frequency of 8.5 Hz, an isolation degree of more than 90 percent at 25 Hz is aimed for, with the isolating effect engaging at around 12 Hz (blue line). A poorly chosen dual-mass vibrator can lead to a resonance catastrophe, with the input amplitudes being transmitted many times stronger to the surrounding environment (red line). The solution is to employ an optimal and economical mounting system that Angst+Pfister custom develops for each cogeneration unit.

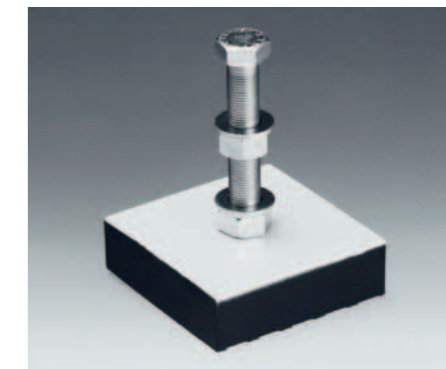
results again and again through our practical solutions. Our engineers measure and analyze the already set-up cogeneration unit and demonstrate implementation recommendations with specific products. Expert service guarantees a perfect solution for the customer. Leading manufacturers like SEVA Energie AG, whom we support as a system supplier of antivibration and fluid handling technology, trust the quality of the service and products they receive from Angst+Pfister. Because, after all, optimal mounting systems ensure quiet and smooth operation of SEVA Energie cogeneration units and thus contribute to a high level of customer satisfaction.

Customer satisfaction thanks to practical solutions

As a supplier of antivibration technology solutions, the Angst+Pfister Group provides its customer with the ideal gear for new and existing machinery and produces convincing

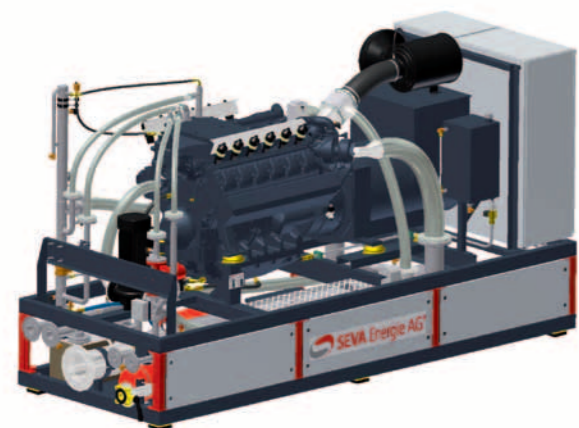


Equipment mount for motor/generator

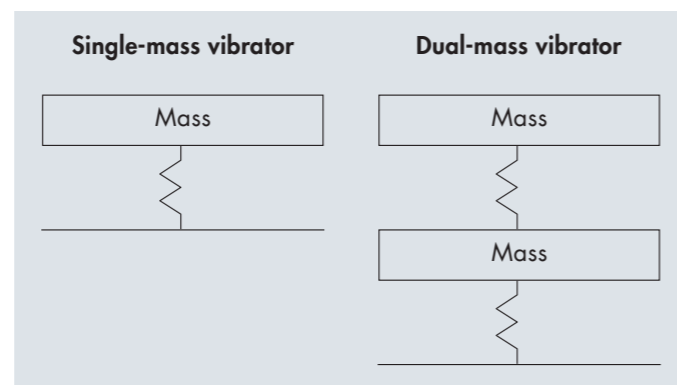


Machine mount for installation of the entire unit

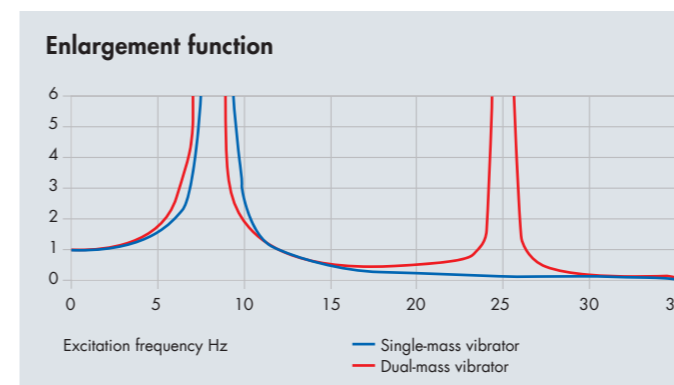
Schematic illustration of a cogeneration unit (source: SEVA Energie AG). Elastic uncoupling of the motor or generator from its surroundings can effectively reduce the transmitted vibrations. To achieve this, elastic mounts are attached directly beneath the motor/generator (yellow mounts). Secondly, the entire cogeneration unit is mounted on elastic machine mounts (gray supports).



Example: Comparison of undamped single-mass and dual-mass vibrators



Potential enlargement function



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