

Ending motor failure

from high vibration to high reliability with **Clean Power VFD**

Énergir Urban Heating and Cooling **Success Story**



94.8%

Reduction in vibration acceleration

87.2%

Reduction in spike energy

0

Motor and bearing failures since the Clean Power VFD was installed

Objective

Énergir urban heat and air conditioning had recurring bearing failures with the current VFDs and wanted to eliminate the bearing and motor failures and reduce overall system stress. The objective was to find a solution that could address the root cause of the failures without relying on additional mitigation solutions or oversized motors.

Challenges

- Annual motor bearing failures, even with inductive filtering
- The competitor's drive couldn't solve vibration issues
- Harsh operating conditions
- Maintenance downtime due to mechanical motor fatigue

Benefits

- Increased reliability:
 - No motor and bearing failures since installation
 - 94.8% reduction in vibration acceleration (4.128G to 0.213G)
 - 87.2% reduction in spike energy (0.494G'SE to 0.063G'SE)
- Simple retrofit: quick VFD replacement
- Cost reduction: eliminate external bulk filters
- Improved reliability with pure sine wave outputs and smooth start/stop functions.



Scan the QR code to learn more how **SmartD Technologies** revolutionize motor control

Ending motor failure

from high vibration to high reliability
with **Clean Power VFD**

Énergir Urban Heating and Cooling **Success Story**

Feedback

"94% vibration reduction and NO BEARING FAILURES after switching to SmartD" - July 2025



About SmartD

SmartD Technologies' Clean Power VFD controls motor speed and reduces stress by delivering clean sine-wave signals instead of traditional "on-off" pulses. This technology integrates filtering directly into the drive using Silicon Carbide (SiC) MOSFETs, eliminating the need for external components. The result is a simpler installation that enhances durability and extends the life of the motor and its bearings.



Solutions

Retrofit with the **Clean Power VFD**

A Variable Frequency Drive (VFD) controls motor speed by converting smooth, continuous electricity into rapid "on-off" pulses through a method called Pulse Width Modulation (PWM).

While effective for speed control, PWM outputs can introduce extra vibration, acceleration forces that shake the motor, leading to high-speed micro-movements that wear bearings faster. In addition, the sharp electrical pulses can cause electrical stress, pitting, or other damage to bearing surfaces.

To address this, the Clean Power VFD was installed in the exact same setup as the previous VFD, using the same motor, operating conditions, and environment.

Installation was straightforward: the electrician simply disconnected the motor cable, removed the external filters, and reconnected the existing cable directly to the Clean Power VFD.

Énergir engaged a specialized vibration analysis firm to repeat the same tests performed on the previous VFD.

The results showed that the Clean Power VFD significantly reduces vibration and electrical stress, protecting both the motor and its bearings by delivering three clean sine-wave signals instead of traditional PWM pulses.

Leveraging advanced Silicon Carbide (SiC) MOSFET technology, the Clean Power VFD integrates filtering directly into the drive, eliminating the need for external components. This design enhances system durability, reliability, and long-term performance while simplifying installation.



Scan the QR code to learn more how **SmartD Technologies** revolutionize motor control