

PdM Vibration Services and Programs

FES' Predictive Maintenance Services (PdM) consist of a quarterly or bi-annual vibration analysis, detailing screw compressor and motor performance for refrigeration applications. Complete and effective vibration analysis provides early warnings of machine defects or component deterioration. This allows for condition based rather than scheduled interval based maintenance, thus preventing unnecessary repairs and down-time. Vibration analysis may be used to detect a variety of problems including bearing failures, unbalanced or misaligned coupling and bearings, in addition to high machine resonance which contributes to component fatigue and early failure. Utilizing this technology to diagnose potential problems, reduces unplanned lost production time, spare parts and labor costs, and the likelihood of a catastrophic machine failure. FES offers other services including field service balancing and customized predictive maintenance programs.

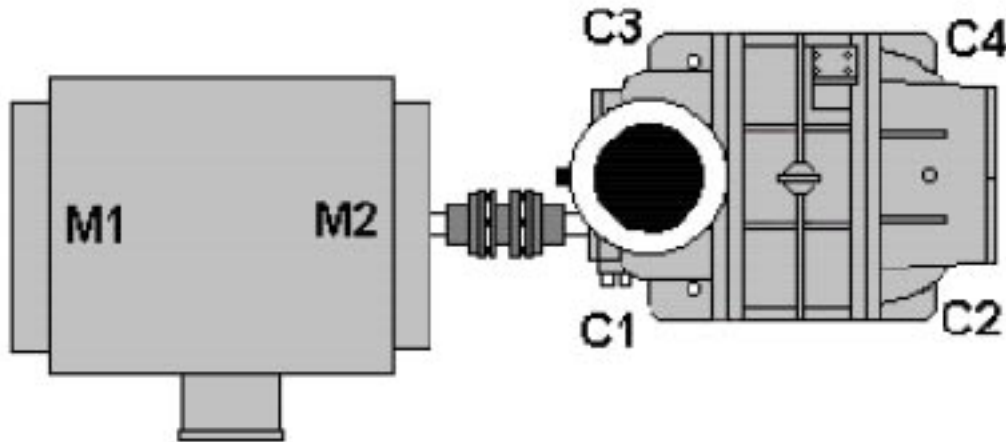


A hand-held data collection unit is used to analyze readings at various vibration survey points on the motor and compressor.

Benefits:

- Experienced compressor and manufacturer personnel provide the vibration analysis report and maintain historical data on the compressor condition.
- Maintenance, repair and rebuilds can be scheduled based on need rather than hours of operation. Early detection of bearing faults or motor electrical problems is now possible via vibration analysis.
- Trending and historical machine performance can pinpoint maintenance needs or component deterioration, providing valuable data that can extend equipment life.
- Most unexpected equipment failures can be avoided by implementing a vibration monitoring program; allowing downtime to be planned around production requirements saving time and money.
- Complete and comprehensive vibration evaluations provide a detailed explanation, a suggested action and the urgency of the findings for each compressor and motor.

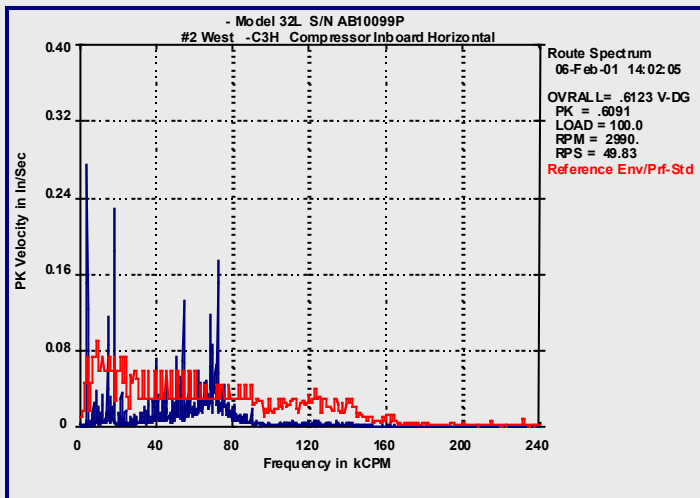
Vibration Survey Points



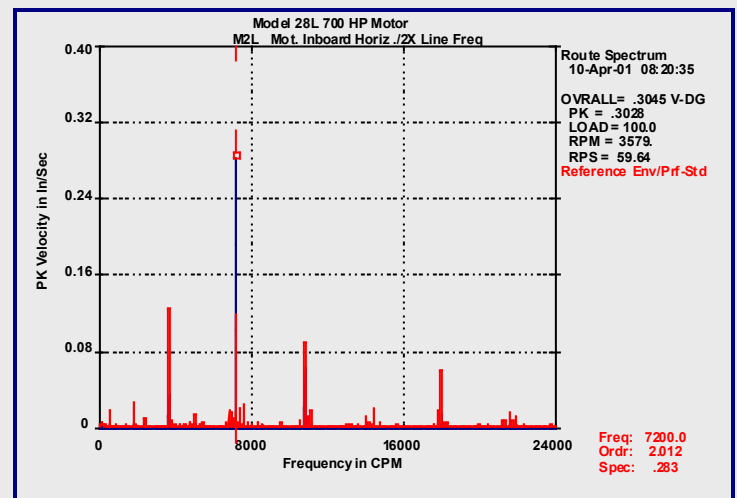
Note: Vibration Survey Points will change based on motor and compressor models and manufacturers.

Many vibration analysis services only measure and analyze overall vibration levels, which may contain a combination of vibrations at all frequencies. FES' PdM service provides a specialized analysis of the vibration level at each individual frequency over a wide spectrum of frequencies. This provides more accurate data to pin-point the exact cause of the problem.

Vibration Survey Problem Detail



FES Model 32L indicates a defect in the female rotor bearing. Vibration analysis detected the problem avoiding a catastrophic compressor failure.



Compressor motor indicates a high 2x Line Frequency Amplitude, indicating a rotating variable air gap between the rotor and stator. An electric repair shop replaced the faulty rotor before it had a catastrophic failure.