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Hanster



Introduction

Vibration monitoring is a crucial tool for diagnosing and preventing failures in vertical pumps. These pumps are commonly used in industries such as water treatment, power generation, oil and gas, and chemical processing. Wired IEPE (Integrated Electronics Piezo-Electric) accelerometers provide high-fidelity vibration data, enabling predictive maintenance and early fault detection.

Common Problems Diagnosed Through Vibration Analysis

Vertical pumps experience a range of mechanical and operational issues that can be detected through vibration monitoring, including:

- **Misalignment** Improper alignment between the motor and pump can lead to excessive vibration, reducing efficiency and causing premature wear.
- · Unbalance Unbalanced impellers or motor rotors create high radial forces, leading to increased vibration levels.
- Bearing Defects Wear, contamination, or lubrication issues can lead to bearing degradation, detected by high-fre quency vibration analysis.
- · Resonance Issues Structural or foundation-related resonance can amplify vibration, causing damage to components.
- Cavitation Hydraulic issues, such as cavitation, produce specific vibration patterns that can be analyzed to prevent impeller damage.
- · Looseness Loose components or fasteners can generate excessive movement and abnormal vibration signals.

Vibration Sensor Mounting Locations

Proper sensor placement is essential for obtaining accurate and useful vibration data. The key locations for mounting wired IEPE accelerometers on vertical pumps include:

1. Motor Bearings (Upper and Lower) - Radial and Axial Measurements

- \cdot Purpose: Detect motor-related faults, such as imbalance, misalignment, and bearing wear.
- Mounting: Sensors should be placed as close as possible to the bearing housings, with one positioned radially and one axially to capture comprehensive vibration data.

2. Pump Bearings (Upper and Lower) - Radial and Axial Measurements

- · Purpose: Identify pump bearing wear, unbalance, and shaft
- \cdot Mounting: Place accelerometers on the bearing housing, with one sensor in the radial direction and another in the axial direction.

3. Pump Casing (Middle Section) - Radial Measurements

- · Purpose: Detect structural vibrations, looseness, and resonance.
- Mounting: Securely attach the accelerometer to the pump casing near the middle section of the pump column.

4. Baseplate or Mounting Structure - Vertical and Horizontal Measurements

Purpose: Monitor foundation-related issues, such as resonance or looseness.
Mounting: Install sensors on the pump baseplate or supporting structure to detect excessive vibration caused by foundation problems.



Excellence in Vibration Monitoring



- Use a Secure Mounting Surface: Ensure the accelerometer is mounted on a clean, flat surface with a stud mount to achieve good frequency response.
- · Proper Cable Management: Route cables away from high-noise electrical sources to prevent interference.
- Temperature Considerations: Select accelerometers rated for the environmental conditions of the pump.
- · Regular Calibration and Maintenance: Periodically check and calibrate sensors to maintain accuracy.

Data Analysis and Alarm Settings

Vibration data should be analyzed using industry-standard techniques such as FFT (Fast Fourier Transform) analysis and envelope detection. Set alarm thresholds based on ISO 10816/20816 standards for pump vibration severity. Trending vibration data over time allows early detection of developing faults, reducing unplanned downtime.

Conclusion

By strategically placing wired IEPE vibration accelerometers on vertical pumps, maintenance teams can detect and diagnose issues before they lead to costly failures. Implementing a vibration monitoring program enhances reliability, extends equipment lifespan, and improves operational efficiency. Regular analysis and maintenance ensure optimal performance and prevent unexpected failures.

Where to mount







Support

With offices worldwide, we can provide customer support no matter where you may be. Our fully trained staff are on hand to assist with any questions you may have.



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