

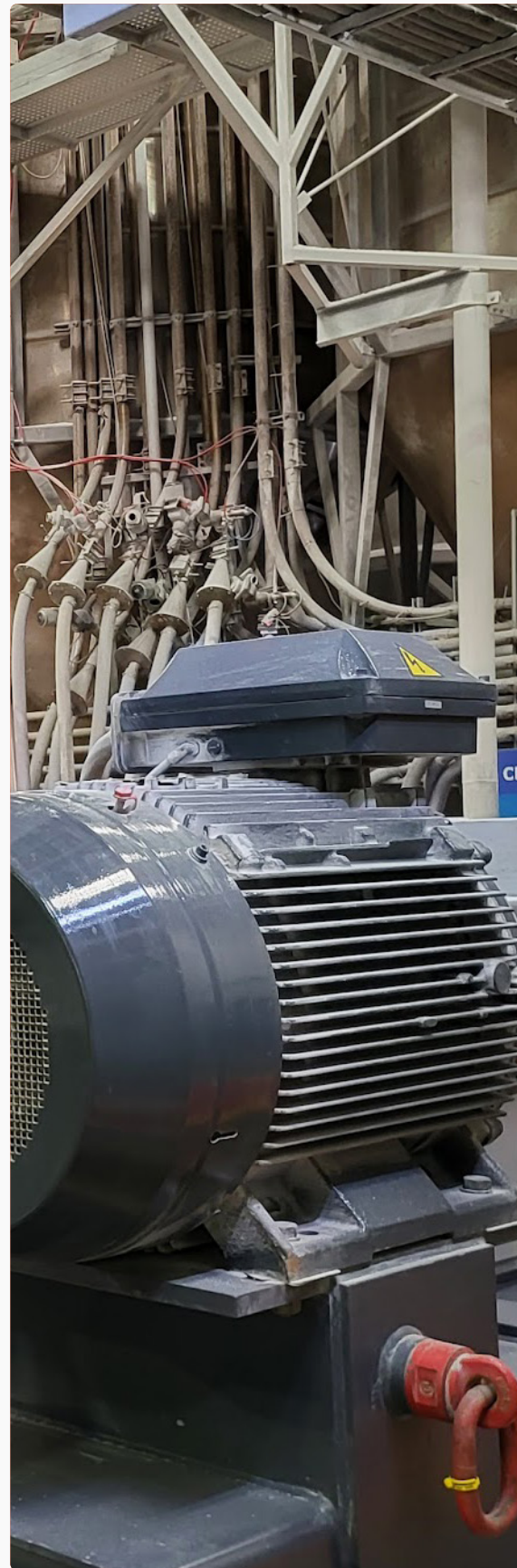
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WHITE PAPER

The role of AI in Blower monitoring in
Industrial Applications

24/7 visibility, AI-driven insights, and expert support for
prescriptive maintenance of critical mining equipment.

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[MOVUS.COM.AU](https://www.movus.com.au)

About MOVUS

MOVUS is an Australian based company on a mission to extend the life of industrial assets, reduce unplanned downtime, and support more sustainable operations through smart, scalable monitoring solutions.

Founded in Brisbane, MOVUS combines AI-powered insights, continuous diagnostics, and hands-on support to help industries move from reactive to proactive maintenance. Our suite of wired and wireless sensors connects to a secure online dashboard that delivers real-time alerts, prescriptive diagnostic reports, and trends across your asset fleet. We don't just give you data. We provide clear, actionable insights so you can address issues early and avoid costly unplanned downtime.

As we've grown, we've reimagined what industrial condition monitoring can be, expanding our range, enhancing our analytics, and introducing 24/7 expert oversight to ensure nothing gets missed.

Today, MOVUS helps critical industries like mining, manufacturing, food processing and utilities unlock more efficient, and more sustainable operations, without the complexity.

Our Vision

Our vision is to inspire a future where every machine is part of a sustainable ecosystem. By minimising waste and maximising efficiency, we're contributing to a world where industries operate in harmony with their environment.

Our Mission

We're driven by a shared mission: to empower industries to thrive by transforming complexity into simplicity. Through real-time monitoring and actionable insights, we enable our customers to make better decisions, prolong the life of their assets and create lasting value.



Our Solutions



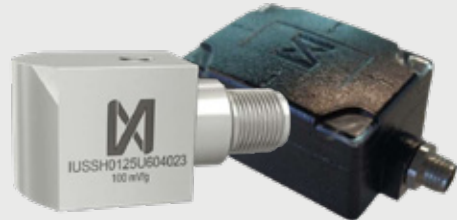
Wireless Sensors



Our wireless range delivers real-time vibration, temperature, run speed, and current monitoring, providing a complete view of asset health and performance.

FitMachine monitors vibration, temperature, and run speed in near real-time to detect shifts in asset behaviour before they escalate.

FitPower adds current monitoring to spot abnormal use, helping detect inefficiencies and emerging faults early. Together, they give a complete view of asset health, install easily via Wi-Fi/Bluetooth, and scale quickly across your site.



Wired Sensors



Our wired sensors are IP68-rated and deliver continuous, high-fidelity diagnostics where wireless isn't practical.

vEdge combines MEMS-based vibration monitoring with ultrasonic sensing and a magnetometer for speed detection, enabling early-stage fault identification. Compact and ideal for assets like pumps and gearboxes.

vSense is a piezoelectric triaxial sensor for critical rotating machinery in extreme environments, providing detailed vibration and temperature insights.



PlantOS



PlantOS is MOVUS's intelligence platform, designed to unify monitoring, diagnostics, and decision-making in one digital hub.

It delivers real-time machine health insights across your entire plant, backed by AI-driven diagnostics and 24/7 expert oversight. With specialised dashboards, you can view asset status at plant, line, or machine level receive fault identification and prescriptive maintenance actions, and track ROI over time.

PlantOS transforms raw sensor data into clear, prioritised actions, helping you reduce unplanned breakdowns, improve maintenance planning accuracy, and extend asset life, all while supporting more sustainable, efficient operations.

Executive Summary

Fans and blowers are indispensable in the process industry.

They circulate process air in cement kilns, provide draft in power boilers, enable mine ventilation, support dust extraction in metals, and ensure safe, regulated airflow in chemical and fertilizer operations. When a fan fails unexpectedly, entire processes can come to a halt, causing safety risks, lost production, and increased maintenance costs. Harsh environments, dust accumulation, vibration, and lubrication challenges make manual inspection unreliable and increase the risk of catastrophic breakdowns.

This paper explains the critical role of fans and blowers, the challenges of monitoring them in real-world conditions, the importance of selecting the right

sensors, and how PlantOS, our Industrial AI platform, detects early-stage fan faults.

We also present deployment results across 3,150 monitored fans in six industries, demonstrating how predictive maintenance enabled:

- >99% availability
- 9,338 faults detected and diagnosed early
- 17,955 hours of downtime avoided
- 20% reduction in Mean Time to Repair (MTTR)
- Significant improvement in safety by reducing manual inspections in hazardous areas

The results prove that AI-driven predictive maintenance for fans and blowers is not optional but an essential strategy for reliability, cost savings, and workforce safety.

Challenges in Blower Monitoring

Monitoring fans and blowers poses unique operational challenges:

Dust or material deposition on blades causing imbalance and vibration.

Bearing failures from improper or infrequent lubrication.

High wear of blades or drive-train components leading to sudden failure.

Access difficulty for fans in confined or remote locations (e.g., cooling towers, mines).

Safety hazards from manual inspection in high-risk environments.

These challenges make automated, real-time monitoring the only reliable way to detect issues before they escalate into catastrophic failures.

Why Sensor Selection Matters

The effectiveness of predictive maintenance depends heavily on the sensors used to collect pump health data.

Electricity Powered Sensors (High-Frequency Capture)

- Capture vibration, temperature & flux every 3–5 seconds.
- Ideal for critical blowers where early-stage fault detection is vital.
- Provide the richest datasets for AI fault models.

Wireless, Battery-Powered Sensors (Low-Frequency Capture)

- Capture data less frequently to conserve battery life.
- Best suited for auxiliary or less critical fans where continuous monitoring is not essential.

Piezoelectric Sensors (Crystal-Based with Stainless Steel Body)

- Highly sensitive to vibration, resistant to harsh industrial environments.
- Long lifespan and reliable performance in extreme temperature, abrasive and corrosive settings such as mining or fertiliser plants.

Choosing the right sensor strategy ensures the balance between cost, coverage, and the diagnostic accuracy needed for critical assets like fans and blowers.

How PlantOS Identifies Early-Stage Faults

PlantOS, the Industrial AI platform, ingests high-frequency sensor data and applies advanced analytics to detect faults at their earliest stages:

- **Data Capture:** Streams raw vibration and temperature signals into the platform.
- **Feature Engineering:** Extracts 70+ engineered features from each dataset.
- **Adaptive AI Models:** Continuously learn normal vs. abnormal behavior.
- **Fault Classification:** Identifies failure modes such as detects imbalance, bearing clearance, lubrication, blade wear, resonance, and more.
- **Prescriptive Insights:** Goes beyond detection, PlantOS recommends the most likely cause and the intervention required.

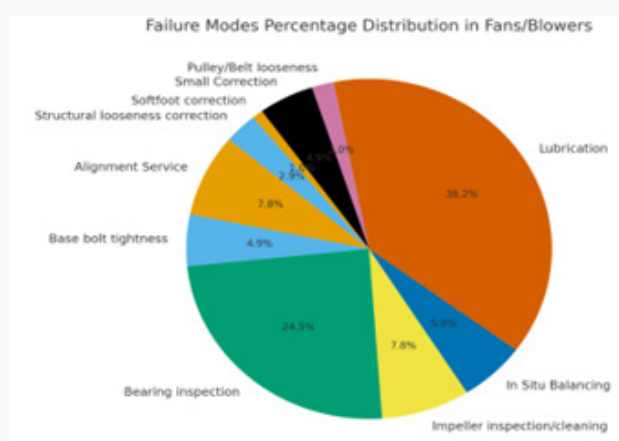
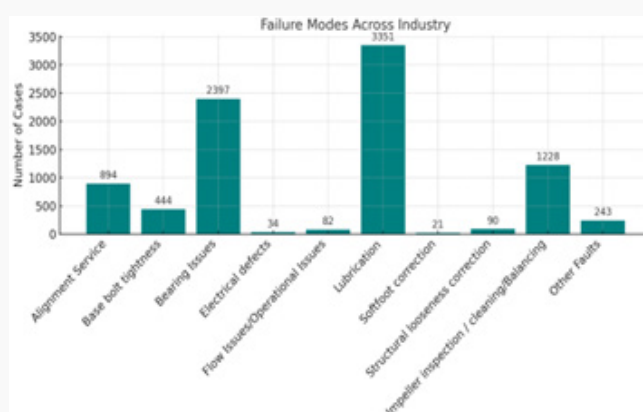
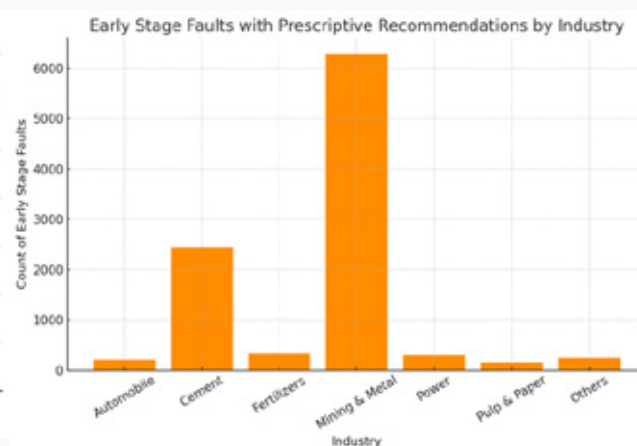
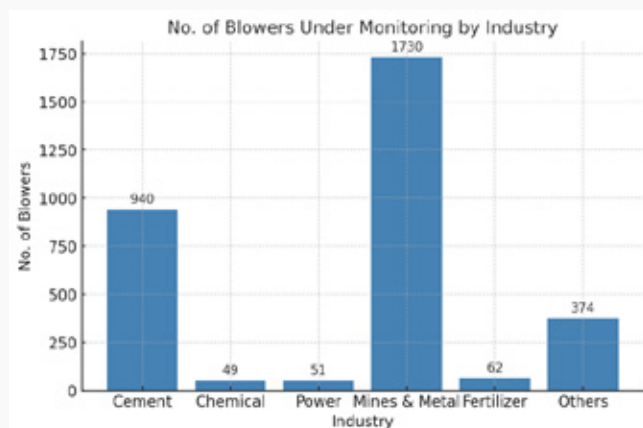
This **closed-loop AI system** reduces false alarms and builds trust with plant teams by aligning predictions with real-world outcomes

Deployment and Results

Across 3150 monitored blowers in cement, mines & metals, fertilizers, tyre and power industries, PlantOS has delivered measurable outcomes:

- **Faults Detected:** 9,338 across categories including bearings, lubrication, misalignment.
- **Downtime Avoided:** 17,955 hours across these deployments.
- **Availability:** >99.9 % with almost no breakdown.
- **Maintenance Efficiency:** Mean Time to Repair (MTTR) reduced by 20%.
- **Safety:** Significant reduction in manual inspection in hazardous areas.

Data Visualisations



Conclusion

Fans and blowers are mission-critical to industrial production. AI-driven predictive maintenance, enabled by PlantOS, transforms maintenance from reactive to proactive. Early fault detection, prescriptive insights, and optimised scheduling ensure higher uptime, safer operations, and reduced costs.

This benchmark project proves that predictive maintenance for fans and blowers is no longer optional, it is essential for sustained competitiveness and operational excellence.



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