

Compressed Air System Optimization

edgeRX™ by TDK SenseI | Predictive Maintenance using Edge AI

OVERVIEW

Compressed air systems are widely used across manufacturing for powering tools, controls, and automation—but they are also one of the most energy-intensive and failure-prone utility systems. Inefficiencies or equipment issues (e.g., compressors, motors, fans) can significantly increase costs and reduce system reliability. TDK SenseI's edgeRX™ enables predictive maintenance by continuously monitoring machine health, applying edge AI analytics, and delivering real-time alerts to optimize compressed air system performance and uptime.

PROBLEM

Compressed air systems often suffer from hidden inefficiencies and gradual equipment degradation. Issues such as motor wear, compressor imbalance, overheating, and mechanical faults can go undetected until they cause performance loss or unexpected downtime.

Key challenges include:

Unplanned compressor downtime impacting production and plant operations

Excess energy consumption from inefficiencies caused by degraded components

Limited visibility into real-time analytics, system behavior, and performance

High maintenance costs due to reactive repairs and emergency interventions

Difficulty detecting early-stage faults in rotating equipment like motors and compressors

EXPECTED OUTCOMES

By deploying edgeRX™ across compressed air systems, manufacturers can improve efficiency, reduce downtime, and better control operational costs.

Expected benefits include:

Reduced unplanned downtime through early fault detection in compressors and motors

Lower energy consumption by identifying inefficiencies and abnormal operating conditions

Reduced maintenance costs through planned, condition-based servicing

Improved system reliability and uptime across air supply networks

SOLUTION

TDK SenseI's edgeRX™ provides a complete machine health monitoring platform that combines smart sensors, edge processing, connectivity, and AI-driven analytics. It is designed to monitor critical compressed air system components—such as compressors, motors, pumps, and fans—in real time.

How edgeRX™ optimizes compressed air systems:

Continuous monitoring: Sensors capture vibration and temperature data from compressors and rotating equipment.

Edge AI analytics: Data is processed locally on the device, enabling fast detection of anomalies and reducing latency.

Predictive insights: AI/ML models identify subtle patterns indicating wear, imbalance, or inefficiency long before failure occurs.

Actionable alerts: Maintenance teams receive real-time notifications to address issues proactively.

Centralized monitoring: Gateway and dashboard provide visibility across multiple compressors and system assets.

SUMMARY

TDK SenseI's edgeRX™ enables predictive maintenance and optimization of compressed air systems by combining continuous monitoring, edge AI analytics, and actionable alerts in a single platform. By identifying inefficiencies and detecting faults early, edgeRX™ helps organizations reduce energy costs, minimize downtime, and ensure reliable compressed air delivery across operations.

