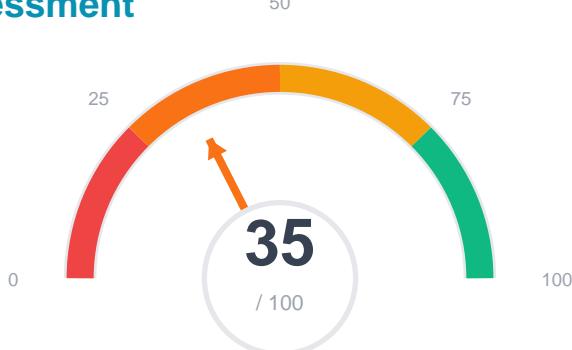


INDUSTRIAL ASSET DIAGNOSTIC REPORT

Asset Health Certificate • Report ID: demo-ind

| | | | |
|---------------|-------------------------|-------------------|----------------------|
| Asset ID: | MOTOR-DEMO-001 | Report Generated: | 2026-01-28 16:57 UTC |
| Data Capture: | 2026-01-28 16:57:03 UTC | Model Version: | 1.0.0-demo |

Overall Health Assessment



Risk: HIGH

| | | |
|----------------------|--------------------|----------------------|
| 7 Est. RUL (Days) | HIGH Risk Level | 65% Anomaly Score |
|----------------------|--------------------|----------------------|

Summary

ELEVATED RISK DETECTED. Asset MOTOR-DEMO-001 shows **HIGH** risk indicators with a health score of **35/100**. Estimated remaining useful life is approximately **7 days**. Schedule maintenance within the next 1-2 weeks to address emerging issues.

Sensor Analysis

Current sensor readings compared against healthy baseline values. Statistics show 24-hour operational summary.

Current Readings

| Sensor | Value | Unit | Baseline | % Deviation | Status |
|--------------|--------|------|----------|-------------|----------|
| Voltage | 226.50 | V | 230.00 | -1.5% | NORMAL |
| Current | 17.30 | A | 15.00 | +15.3% | CRITICAL |
| Power Factor | 0.72 | | 0.95 | -24.2% | CRITICAL |
| Vibration | 0.52 | g | 0.00 | +0.0% | N/A |
| Power | 2.82 | kW | 3.27 | -13.7% | ELEVATED |

24-Hour Statistics

Simulated historical data for demonstration purposes

| Sensor | Min | Max | Mean | Std Dev |
|--------------|--------|--------|--------|---------|
| Voltage | 217.99 | 238.28 | 228.60 | 5.000 |
| Current | 8.62 | 23.22 | 15.92 | 3.000 |
| Power Factor | 0.67 | 1.01 | 0.84 | 0.060 |
| Vibration | 0.05 | 0.55 | 0.30 | 0.100 |
| Power | 0.99 | 5.07 | 3.03 | 0.800 |

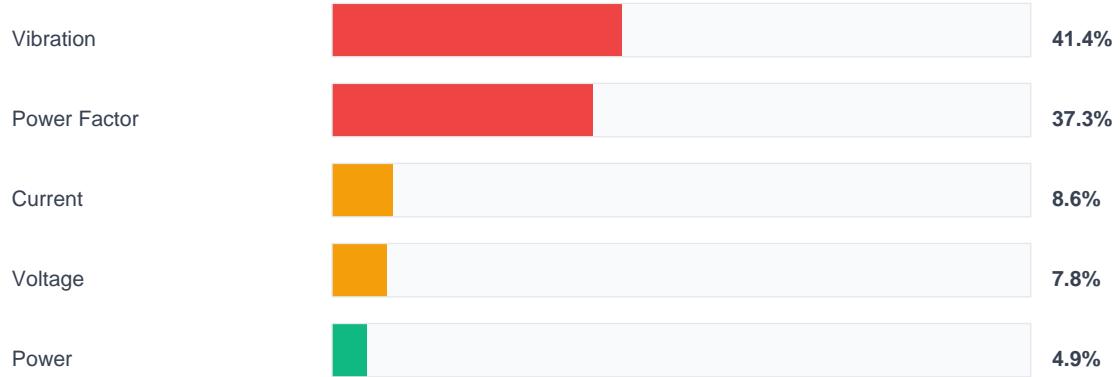
Baseline Reference

Deviation percentages are calculated against healthy baseline values: Voltage=230.0V, Power Factor=0.95, Vibration=0.0g (ideal). Status thresholds: NORMAL (<5%), ELEVATED (5-15%), CRITICAL (>15%).

ML Explainability Analysis

Understanding why the system flagged this health state. Feature contributions show which sensor readings most influenced the assessment.

Feature Contributions



Key Insights

- **Vibration** contributed **41.4%** to the risk assessment. Current value (0.52) is 7.4σ from baseline. [CRITICAL]
- **Power Factor** contributed **37.3%** to the risk assessment. Current value (0.72) is 6.7σ from baseline. [CRITICAL]
- **Current:** 8.6% contribution, value=17.30 [ELEVATED]
- **Voltage:** 7.8% contribution, value=226.50 [ELEVATED]

Primary Driver Analysis

The primary contributor to the current risk state is **Vibration**. This factor showed the highest deviation from expected baseline values and requires immediate attention as part of the maintenance response.

Business Impact & Maintenance Planning

Cost-benefit analysis of predictive maintenance intervention and recommended actions.

ROI Analysis

| Metric | Value | Notes |
|----------------------------------|-------------|---|
| Est. Preventive Maintenance Cost | \$450 | Planned service intervention |
| Cost of Unplanned Failure | \$45,000 | Includes downtime + repairs |
| Potential Savings | \$44,550 | Per prevented failure event |
| ROI Multiplier | 100x | Return on maintenance investment |

Recommended Maintenance Actions

Priority: HIGH

Primary Driver: Vibration

Action: Schedule bearing replacement within 48 hours

Supporting Actions

- Schedule maintenance window within next 48-72 hours
- Order replacement parts if applicable
- Increase monitoring frequency to 15-minute intervals
- Review recent operational changes or load patterns

Audit Trail & Compliance

Detailed process log and regulatory compliance verification for audit purposes.

Process Log

Timeline of data processing steps with millisecond precision. Timestamps are relative to the data capture event.

| Step | Process | Timestamp (UTC) | Status |
|------|----------------------------|-----------------------------|------------|
| 1 | Sensor Data Capture | 2026-01-28 16:57:03.192 UTC | ✓ Complete |
| 2 | ADC Conversion | 2026-01-28 16:57:03.222 UTC | ✓ Complete |
| 3 | Data Packet Assembly | 2026-01-28 16:57:03.262 UTC | ✓ Complete |
| 4 | Network Transmission | 2026-01-28 16:57:03.322 UTC | ✓ Complete |
| 5 | API Gateway Receipt | 2026-01-28 16:57:03.362 UTC | ✓ Complete |
| 6 | Schema Validation | 2026-01-28 16:57:03.402 UTC | ✓ Complete |
| 7 | Derived Signal Computation | 2026-01-28 16:57:03.442 UTC | ✓ Complete |
| 8 | InfluxDB Write | 2026-01-28 16:57:03.492 UTC | ✓ Complete |
| 9 | Feature Calculation | 2026-01-28 16:57:03.542 UTC | ✓ Complete |
| 10 | Baseline Comparison | 2026-01-28 16:57:03.582 UTC | ✓ Complete |
| 11 | ML Model Inference | 2026-01-28 16:57:03.612 UTC | ✓ Complete |
| 12 | Anomaly Score Generation | 2026-01-28 16:57:03.632 UTC | ✓ Complete |
| 13 | Health Score Computation | 2026-01-28 16:57:03.642 UTC | ✓ Complete |
| 14 | Risk Classification | 2026-01-28 16:57:03.652 UTC | ✓ Complete |
| 15 | Explanation Generation | 2026-01-28 16:57:03.672 UTC | ✓ Complete |
| 16 | Report Assembly | 2026-01-28 16:57:03.692 UTC | ✓ Complete |
| 17 | PDF Rendering | 2026-01-28 16:57:03.722 UTC | ✓ Complete |
| 18 | PDF Report Generation | 2026-01-28 16:57:03.645 UTC | ✓ Complete |

Compliance Verification

This report has been generated in accordance with the following standards:

| | Standard | Description | Status |
|-------------------------------------|---------------------------------|--|-----------|
| <input checked="" type="checkbox"/> | ISO 55000 Asset Management | Asset lifecycle management framework | Compliant |
| <input checked="" type="checkbox"/> | ISO 13374 Condition Monitoring | Machine condition monitoring and diagnostics | Compliant |
| <input checked="" type="checkbox"/> | ISO 17359 Monitoring Guidelines | Condition monitoring and diagnostics of machines | Compliant |

Data Integrity Statement

This report was generated from persisted system data and represents the exact assessment state at the recorded data capture timestamp. All values shown in the Executive Summary and Sensor Analysis sections are immutable snapshots from the assessment performed at 2026-01-28 16:57:03 UTC. Historical statistics and trend visualizations are simulated for demonstration purposes and are clearly marked as such.

Report ID: demo-industrial-001 | Generated: 2026-01-28 16:57:03 UTC | Model Version: 1.0.0-demo
Predictive Maintenance & Energy Efficiency Platform — Digital Twin Simulation