

Metroscope

Monitor, diagnose, and reduce maintenance cost through automation and artificial intelligence

Metroscope is a globally-proven solution providing reliable and fast diagnosis of plant equipment for better operations and maintenance decisions.

Challenge

Plants are seeking solutions to monitor assets and quickly diagnose root causes with high reliability. The industry wants to reduce the need for specialized monitoring expertise and get diagnosis information they can trust in order to reduce schedule maintenance and unnecessary cost. Plants need to find sources of lost power and potential downtime quickly to avoid major impacts. In order to achieve this, the industry has recognized the need for artificial intelligence (AI) technology used in combination with knowledge and operating experience.

Solution

Metroscope is a state-of-the-art, knowledge-based AI system for diagnostics. The patented Metroscope solution offers reliable, automatic diagnostics immediately and with high accuracy. Metroscope detects early stage asset reliability problems on plant secondary circuit components to avoid costly damage, unplanned outages and lost megawatts. Metroscope achieves fast root cause detection using a digital twin combined with a unique AI method. This proven technology has been used in plants around the world to detect early-stage problems before they become major sources of lost productivity and maintenance expense.

The Metroscope fault library is a source of operating experience embedded in a digital twin of the plant secondary circuit. The system is highly accurate given the sensors typically found already installed in the plant. Metroscope software is connected to each digital twin and deployed at the plant or in a monitoring center for automated diagnosis including:

- Valve faults/misalignments
- Two-phase water-level faults
- Tube ruptures/leaks
- Blockage or fouling
- Instrumentation drift
- Pump performance degradation
- Internal leakage

Your performance
is **our** everyday **commitment**



Customer benefits

- Detect early-stage equipment reliability issues
- Detect instrument drift
- Detect lost plant thermal performance
- Get live detections using AI
- Use reliability as basis for cost reduction
- Learn to use the software in minutes
- Avoid specialized software training
- Analyze the live impact of flexible operations
- Get operating experience from the fault library
- Add plant-specific operating experience
- Own the open source digital twin
- Receive annual calibration tuning of the model

Key figures

- 87%** Reliability of fault detections
- 3kg/s** Threshold for feedwater tube rupture detection 15 kg/s analytical threshold
- 5MW** Amount of power one customer expects to recover
- 70%** Reduction in time spent on Excel cause detection spreadsheets

Technical information

Metroscope technology combines your plant data, equipment physics and an advanced algorithm to create the most reliable diagnostics approach available.

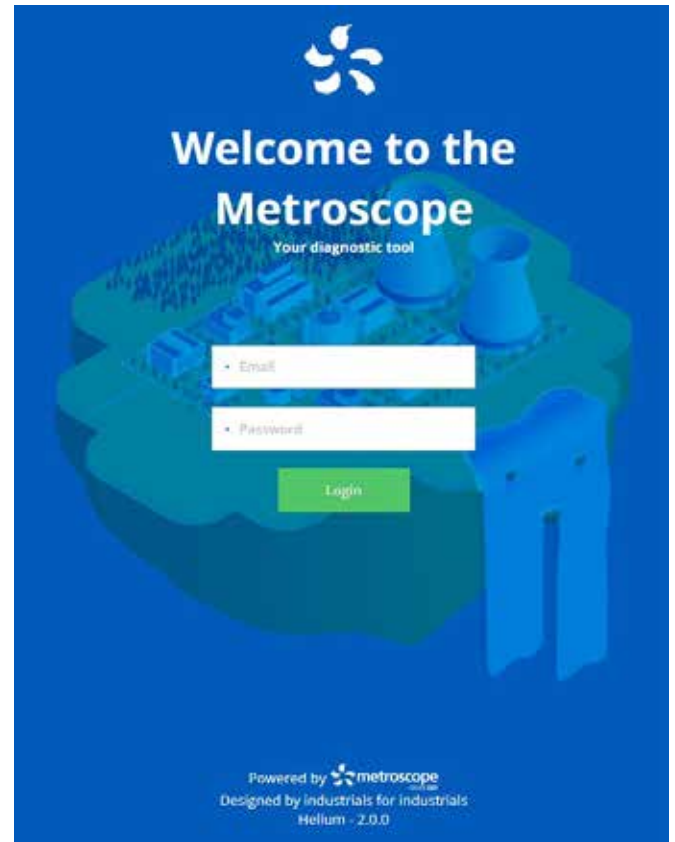
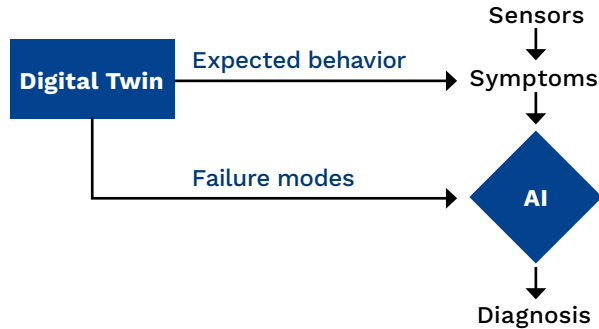
The diagnosis technology relies on two core features:

- A knowledge basis – the Digital Twin
- An inference engine – the AI

A precisely-calibrated Digital Twin allows Metroscope to build a failure library with all failure modes. Then, the software compares actual instrument readings with the expected ones from the Digital Twin. The difference is considered a symptom. Just like medical diagnosis problems where Metroscope derived its approach, each symptom has many possible causes.

Once the symptoms and the failure modes are known, there is no guessing game. Metroscope uses its algorithm based on Markov Chains to pinpoint the root cause and its impact on live plant operation. The diagnoses are delivered through intuitive software that can be learned in minutes with no specialized training.

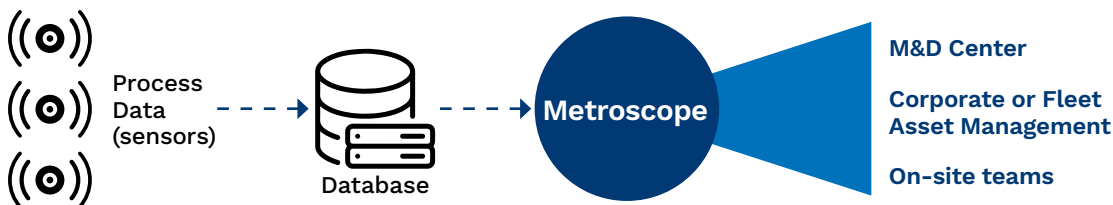
Metroscope software uses engineering expertise, plant data and AI innovation to analyze the plant and diagnose latent problems and underlying causes in order to restore equipment health and performance.



Experience

- >36 units** units equipped with Metroscope
- 5 countries** countries where Metroscope is active
- 5,000** accurate fault detections

Metroscope in Your Organization



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