Procon Engineering

Steam Boiler Leak Detection

BESTOBELL AQUATRONIX

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Protect your plant. Maximize uptime.

Boiler tube leaks are one of the leading causes of unplanned outages in fossil fuel power plants and any high pressure steam process. Even a minor leak can escalate quickly, causing extensive damage, costly downtime, and potential safety risks.

Procon's Leak Detection System provides an early warning that helps you avoid unplanned outages, reduce repair costs, and keep your plant operating safely and efficiently.

Field proven and globally trusted

With more than 250 installations in over 20 countries, our systems are trusted by power stations around the world. Each installation is tailored to your site's specific conditions, with the right mix of microphone (acoustic) or structure-borne (vibration) sensors—or both.

Key advantages

- Early leak detection for safer operations
- Increased boiler uptime
- Reduced repair costs and secondary damage
- Planned shutdowns at the right time
- Reliable system performance, even in harsh conditions
- Flexible design: standalone system or DCS-integrated

Applications

Our systems are used across a wide range of applications, including:

- Fossil fuel power plants
- High-pressure steam boilers
- Medium and low-pressure boiler systems
- Gas turbine exhaust heat recovery systems

If your operation uses steam or heat recovery, our technology will extend uptime and reduce risk.

Built for plant maintenance

Boiler tube leaks account for a significant amount of lost power generation due to unplanned outages. Our system helps operators catch issues early, assess damage accumulation, and schedule repairs before failure occurs. It's a smarter way to protect your equipment, your people, and your bottom line.

Designed for real-world performance

Procon Engineering has invested heavily in new electronics, particularly in the structure-borne sensor version of the T196 Head Amplifier. Designed to detect structural vibrations caused by boiler leaks, this updated system significantly improves the signal-to-noise ratio of traditional piezoelectric sensors and charge amplifiers. The result: four times greater sensitivity and earlier, more reliable leak detection. This advancement has been recognised in an internationally published research study.

Originally developed to improve sensitivity of structure-borne sensors, the T196's advancements have been recognised in international research. It's a leap forward in identifying boiler leaks earlier and more accurately, helping plant operators take action before issues escalate.

The next evolution in boiler leak detection, our T196 Head Amplifier delivers advanced digital signal processing (DSP) directly at the sensor site with datalogging capacity on each unit. Each amplifier features an embedded ARM Cortex microcontroller that analyses acoustic and ultrasonic signals in real-time, filtering out background noise and enhancing leak detection sensitivity.

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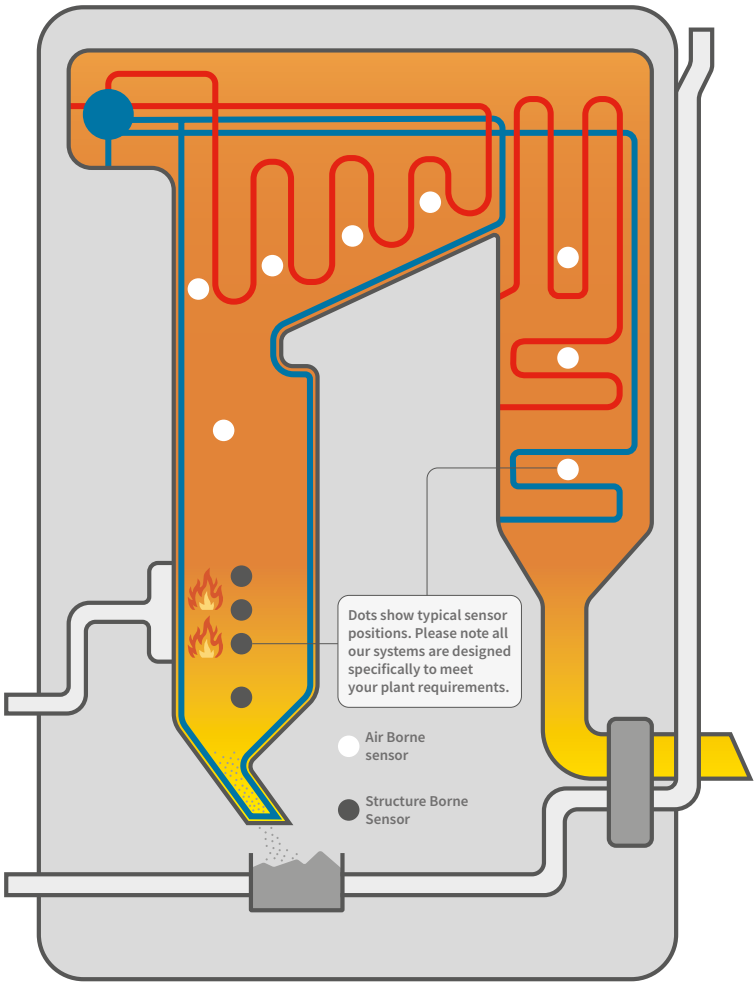


T196 system highlights

- Localised digital signal processing at the boiler
- Enhanced signal-to-noise ratio
- Time and frequency domain analysis, including FFT and spectral density
- Unique programmable bandpass filters and autocorrelation functions for detecting weak, periodic leak signals
- Internal data logging for historical signal analysis

Boiler system hardware & sensors

Our hardware, head amplifiers and sensors are built to endure the realities of a boiler house—shock, vibration, heat, and noise.

T196 Acoustic Microphones

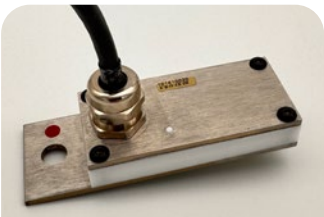
- Ruggedised, Shock and Vibration resistant
- 30 to 50 times more sensitive than piezoelectric industrial microphones
- High fidelity microphone to support frequency domain analysis.

T196 Structure-Borne Dual Sensors

- Piezoelectric sensors that use the boiler wall as a diaphragm
- Measure ultrasonic sound and acoustic frequencies from steam leaks

Plant Boiler Side System

Acoustic Sensor Microphone


Structure Piezo Sensor

Wave Guide for Microphone

Head Amplifier

Control Room

Procon Control System*

Direct DCS connection is possible without Procon Control System.

Procon Control & Analysis System

The control terminal gives operators a powerful view of boiler health. The Procon system run independently on a PC. Or the signals can be directly connected to the plant DCS system.

Software-driven insights Custom displays, bar graphs, trend charts, and boiler mimic diagrams give operators a clear view of current performance and emerging issues. Built-in FFT (FastFourier Transforms) & Spectrum Analysis are generated in the T196 Head Amplifiers and PC software diagnostic tools help confirm real leaks and reduce false alarms.

Key software features

- Custom mimic diagrams built to your specs
- Up to 64 channels, supporting up to 4 boilers
- Trend data from multiple channels is operator
- Built-in FFT (FastFourier Transforms) & Spectrum Analysis are generated in the T196 Head Amplifiers and PC software diagnostic tools help confirm real leaks and reduce false alarms.
- Portable sound calibrator ensures consistent setup
- Early warning alarms for low signal and probable leaks
- Soot-blower interlocks
- Optional audio output for real-time monitoring

User configurable dashboard, for individual sensor data, live trend charts, bar charts, and alarm list.

Bar graphs of all sensor or selected sensor groups.

Historical trend data of selected sensor groups.

Home screen with fixed layout of a bar chart, live trend chart, and alarm list.

Service that supports you

We provide comprehensive training, support, and maintenance to keep your leak detection system operating at its best. Our global service team is ready to help, and Procon offers contract support to ensure long-term performance and peace of mind.

Support highlights

- Global service
- Service contracts available
- Installation and commissioning
- Calibration, repair, and upgrades
- Remote diagnostic support

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