We Measure What Matters: Success Story

The PAD: Partnership-Driven Customization for Steam Boiler Levels

Industrial boiler operations demand reliable and precise measurement for water level monitoring. Too little water can lead to overheating and catastrophic damage, while excessive water levels can cause carryover, resulting in reduced efficiency and potential damage to downstream equipment. At KOBOLD, we combine proven differential pressure measurement technology with a collaborative approach to deliver solutions that address both the technical challenges of boiler level measurement and the unique operational requirements of each customer.

The Technical Challenge of Boiler Water Level Measurement

Industrial boilers present unique measurement challenges that make accurate water level monitoring particularly complex. Steam generation creates violent water surface agitation, temperature variations cause density changes in both water and steam phases, and the high-pressure environment can exceed the capabilities of conventional level measurement technologies.

Water levels in boilers fluctuate regularly due to steam demand variations, feedwater changes, and load cycling. These dynamic conditions require a measurement system that can respond quickly. The consequences of inaccurate level measurement extend beyond equipment damage to include safety risks, energy efficiency losses, and unplanned downtime.

Traditional measurement approaches often fall short in these demanding conditions. Float-based systems can be affected by surface turbulence and require mechanical components that may fail in high-temperature, high-pressure environments. Direct level measurement technologies may struggle with the violent conditions inherent in steam boiler operations.

How the KOBOLD PAD Solves These Challenges

Differential pressure transmitters, such as the KOBOLD PAD, are a proven solution to these challenges. Differential pressure transmitters measure water level by detecting the hydrostatic pressure difference between two points in the boiler. This method relies on the fundamental relationship between liquid height and pressure: as water level increases, the pressure at the bottom measurement point increases proportionally to the reference point above the water surface.

This approach remains unaffected by surface agitation because it measures the static pressure column rather than relying on direct contact with the turbulent water surface. The differential pressure method provides a continuous, stable, and accurate water level indication regardless of operating conditions.

Superior Performance Specifications

- High accuracy up to 0.075% of span
- High rangeability of up to 100:1
- Zero-Point adjustment for specific installation requirements
- Digital 4-20 mA or HART® signal compatibility
- Ambient temperature compensation
- Continuous self-diagnostic functions

For boiler installations, the system connects one leg to the boiler below the minimum water level and the other reference leg to the top of the boiler. A condensation pot in the reference leg protects the pressure transmitter and ensures consistent reference conditions. The measured differential pressure represents the water column height, calculated as the difference between total system pressure and reference leg pressure.

Recent Customer-Driven Enhanements

Enhanced interface programming that allows technicians to perform complex configurations and diagnostics directly through the device interface, eliminating the need for laptops in the field
Improved setup responsiveness and modified interface navigation for quicker, more intuitive operation. Custom scaling and mounting options for unique installation requirements and challenging environments. Each modification is developed through direct customer collaboration to ensure the solution fits their operational and performance requirements.

The Partnership Process

Application Analysis: We begin with comprehensive analysis of your complete measurement challenge, including operational constraints, maintenance requirements, system integration needs, and long-term performance goals.

Solution Development: Based on this understanding, we develop tailored solutions, whether standard products, modified configurations, or custom features - ensuring both performance and quality expectations are met.

Results: Technical Performance with Operational Excellence

The combination of proven PAD technology and our partnership approach delivers solutions that address both technical and operational requirements:

Reliable Level Measurement: Differential pressure technology provides accurate, stable measurement regardless of boiler operating conditions, preventing both low-water damage and high-water efficiency losses.

Operational Integration: Custom configurations integrate seamlessly with existing control systems and operational procedures, reducing training requirements and installation complications.

Ready to Talk About Your Application?

What Sets Us Apart

- Direct engineer access for any project size. No gatekeepers, no minimum order
- Free consultations that deliver tailored, application-specific recommendations
- Work with us directly or in tandem with your local KOBOLD distributor
- Expert cross-over guidance and replacement solutions when needed
- Decades of real-world expertise to avoid costly mistakes and downtime
- Old-fashioned personal service backed by modern video scheduling

Ready to talk through your application? Scan the QR code on this page (or visit koboldusa.com/schedule-consultation) to book a convenient video consultation with one of our engineers.