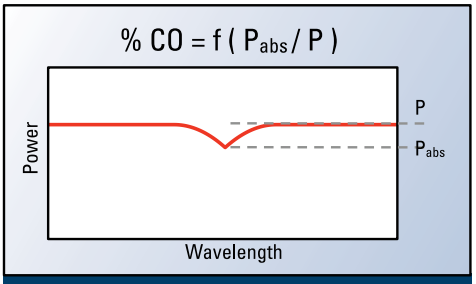
ZoloBOSS

Boiler Optimization Spectroscopy Sensor

The Zolo Technologies Zolo*BOSS™* is an innovative laser-based sensor which requires only a line of sight and easily installed water-wall membrane penetrations to measure through ultra-harsh environments. There are no probes to insert or sensitive electronics near the fossil-fired boiler.



Each measurement compares a baseline transmission through the boiler to how much light was transmitted at a specific wavelength: the absorption peak. Concentration is proportional to ratio of the values and not to how much light travels across the combustion zone, making it insensitive to dust and ash.

Proven Technology

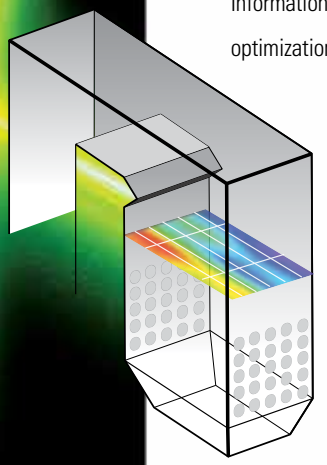
The Zolo*BOSS* is based on a well proven technique known as tunable diode laser absorption spectroscopy (TDLAS) which is founded on the premise that every molecule has a unique light absorption fingerprint. Developed in collaboration with Stanford University's High Temperature Gasdynamics Laboratory, TDLAS employs industry standard telecom diode lasers tuned to unique absorption peaks for each measured constituent.

The Zolo*BOSS* combines several lasers onto a single optical fiber and then transmits the light across the boiler. Light is collected by a receiver and transmitted back to the control rack where the ratio of unabsorbed light to absorbed light is measured to determine individual concentrations.

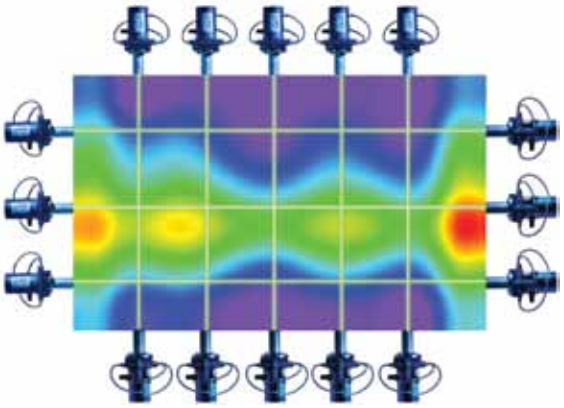
Each path simultaneously measures an average concentration of O_2, CO, CO_2, H_2O, and temperature. Multiple paths are arranged in a grid pattern on one or more elevations in the boiler. Using sophisticated mathematics, the averages are combined to create a concentration profile similar to CAT scanning.

Multiple Paths Provide a 2-D Profile with a Single Instrument

A Zolo*BOSS* sensor consists of up to 15 paths and measures and maps multiple concentrations and temperature simultaneously. Data is communicated in real-time to the plant DCS or historian using the industry standard OPC protocol. Information can be fed into automated combustion optimization software to provide closed-loop control and real-time optimization to improve efficiency and reduce emissions.



Multiple paths arranged around the boiler create maps of combustion wherever needed, even in the heart of the combustion zone where no other sensor can survive.



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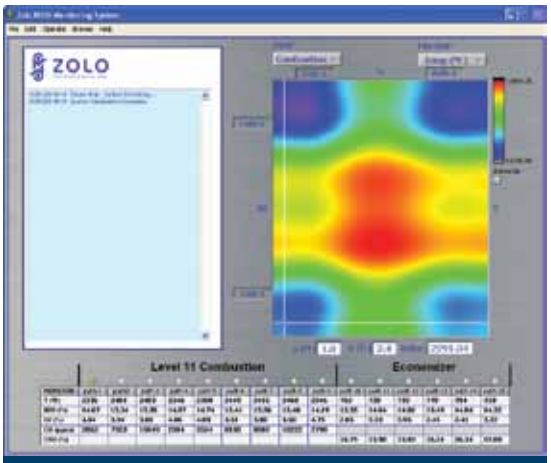
Modular Design

The Zolo*BOSS* instrument includes a control rack, located in the relay room or control room of the plant. The control rack houses all the sensitive electronics, including lasers, detectors and computers. Light is transmitted to a cabinet near the boiler and then distributed to each of the send heads, one at a time. Each head transmits light across the boiler to a receive head on the other side where it is collected and returned to the control rack for analysis. For a typical system, a complete profile of the boiler is updated every four to five minutes.

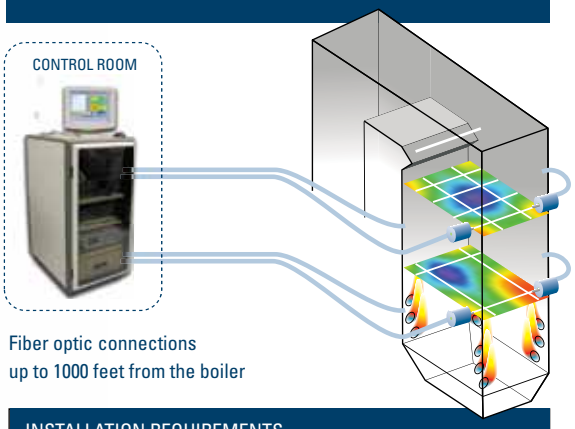
Balance Your Combustion

- Improve efficiency (heat rate)
- Increase availability
- Improve fuel flexibility
- Reduce NO_x and CO_2 emissions
- Reduce slagging and fouling
- Reduce excess O_2 levels

Zolo*BOSS* SensAlign transmitter and receiver heads realign as necessary to ensure optimum power transmission even in the dynamic environment of a coal-fired boiler. Membrane penetrations allow 15 paths to be installed in 48 hours without scaffolding and automatic port rodders keep openings clear.



Zolo*BOSS* software shows individual path average data for each constituent, and also a tomographic map, updated in real-time. Data from the instrument can be used with the plant DCS or even fed into 3rd party combustion optimization systems.



Fiber optic connections
up to 1000 feet from the boiler

INSTALLATION REQUIREMENTS	
Power	1 x 1 kW at control rack; 2 x 1 kW at matrix distribution cabinet
Penetrations	0.375 x 3 inch slot in water-wall membrane; line of sight across boiler or duct
Air purge (for a typical 15 path system)	90 – 150 PSI, 140 SCFM; quality: general purpose, oil free air
Communications	OPC compliant client with customer specified tags. Other communications protocols are available upon request. Broadband VPN access.

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