

Accutemp™

Advanced Acoustic Pyrometer



A SmartClean™ Solution

System Benefits

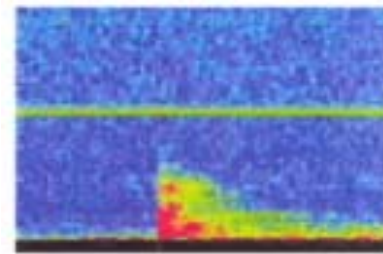
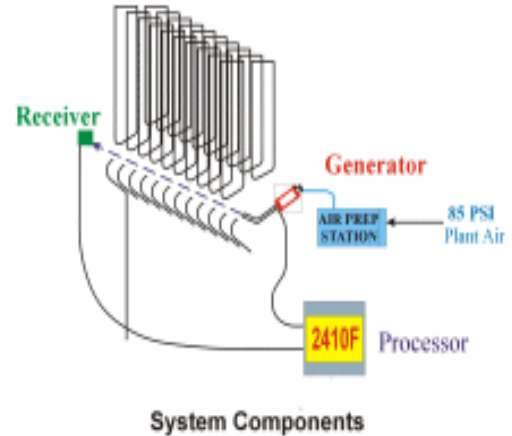
The Accutemp acoustic pyrometer system has established a new benchmark in boiler furnace temperature measurement using an innovative high-energy sound wave technology. It precisely measures the time taken for a waveform to travel a known distance. This time corresponds precisely with the average flue gas path temperature.

FUEL SAVINGS

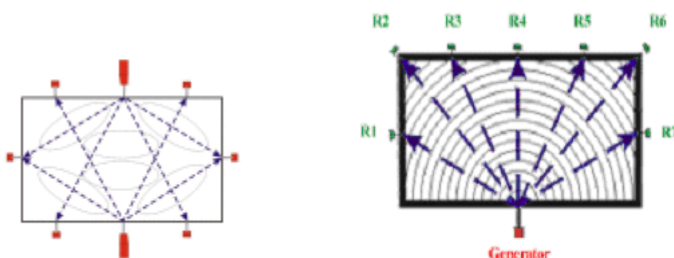
- Control slagging & fouling
- Proper burner operation for reduced NO_x
- Efficient combustion and reduced LOI
- Optimized soot blowing (SmartConvection™)
- Boiler optimization verification

REDUCED MAINTENANCE COSTS

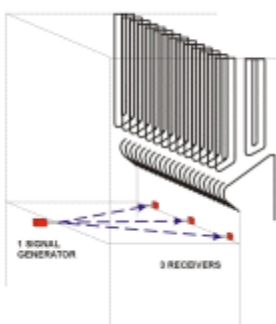
- Reduced tube erosion
- Reduced “high back-end” temperatures
- Improved start-up temperature control
- Tube leak detection



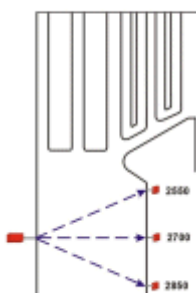
FURNACE MULTI-ZONE



ACOUSTIC PYROMETER THERMOSCAN



THERMO-SCAN NOx CONTROL



Applications

A significant advantage of the Accutemp™ over optical methods when additional transmitters or receivers are added is its ability to provide the operator with accurate information over the entire cross-section of the furnace.

This capability can provide unrivalled clarity for optimizing NO_x by controlling combustion and seeing the results as the changes are made in real-time.

Accutemp provides precise feedback on the performance of the furnace, and can be used to reliably determine the effect of system changes. For example, the effect of the addition of SmartCannons or SmartSensors can be accurately determined.

Overview of Flue Gas Path Temperature Monitoring Methods

Optical	AccuTemp™	Thermoprobe	HVT
Precision +/- 50°F	Precision +/- 25°F	Precision +/-20°F	Precision +/-20°F
Single point measurement	Line of sight average	Along path of travel	Along path of travel
Reach < 20 feet	Full width, reach > 100 feet	Along path of travel, maximum length 25 feet	Along path of insertion, maximum 20 feet
No ability to determine combustion hot spots	Matrix configuration provides accurate hot spot localization	Start-up only	Can determine hot-spots when used
Continuous cooling air required often causing slag accumulation at opening	Integrated solenoid only actuates port cleaning on reading	Cooling air required during operation	Cooling air required during operation
Permanent	Permanent	Start-up	Spot Check
Single point cost circa \$15k	Single point cost circa \$25k	Single point cost \$30k	2-3 days \$20k
6-point matrix cost: \$90k	6-point matrix cost: \$60k	Not applicable	Not applicable

System Design

Acoustic Signal Generator

Includes primary signal generator, transmission barrel, charge control valve assembly, trigger assembly, and an air amplifier with regulator.

Sound Generator

Receives amplified station air and generates 190 dB impulse sufficient to maintain cleanliness.

Transmission Barrel

Directs sounds from sounds generator into boiler.

Mechanical Control Components

Charge Control Valve, Trigger assembly and Air Amplifier combine to provide local control of the Sound Generator.

Acoustic Signal Receiver

Listening mechanism for detection of the sound wave mounted at the far side of the boiler

Signal Processor and Controller

Housed in NEMA 4 enclosure, flat screen display, up to 16 separate 4-20 mA signals for reporting temperatures along different paths.

