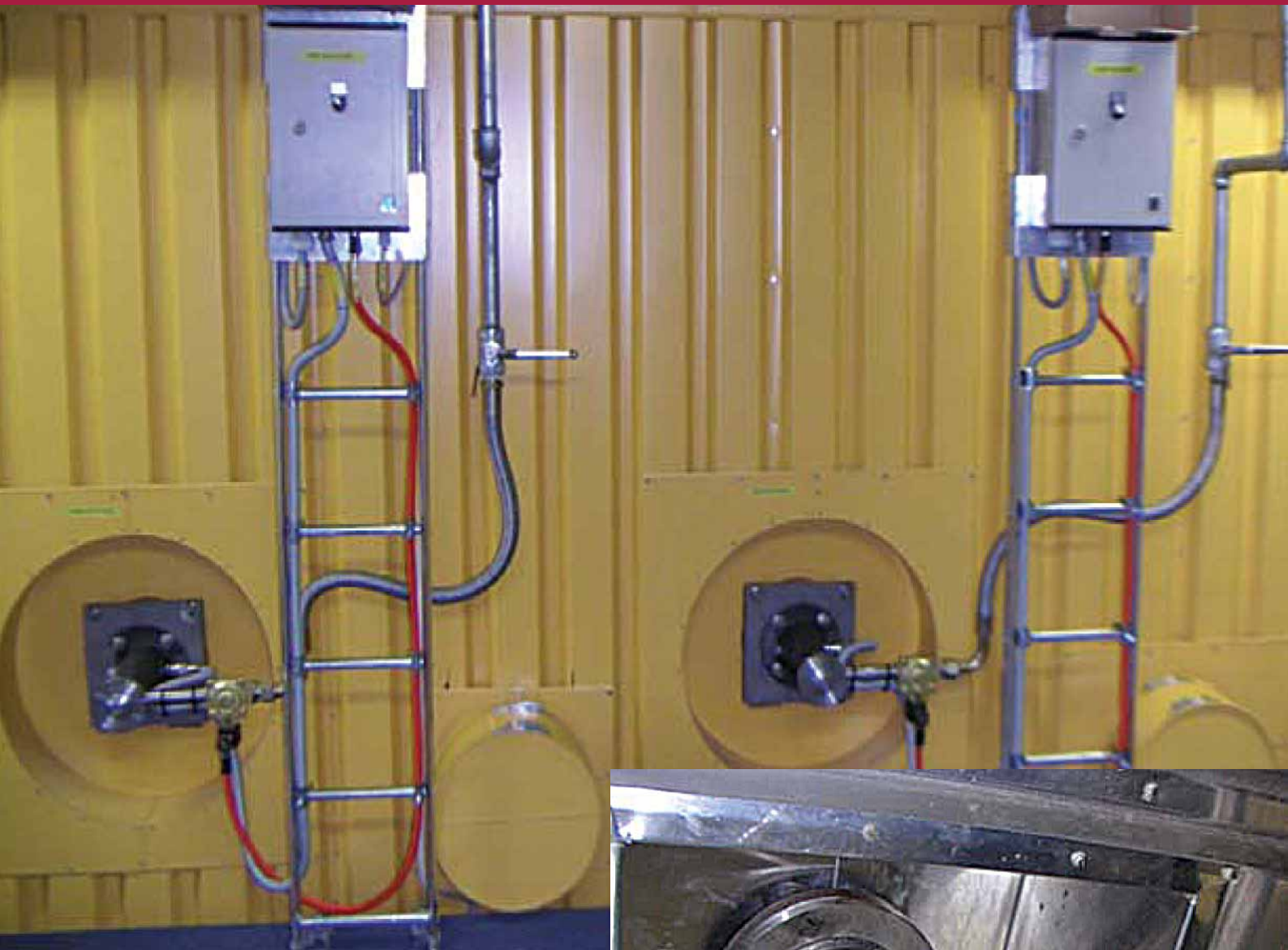


AGAM BROCHURE

JUNHO 2013

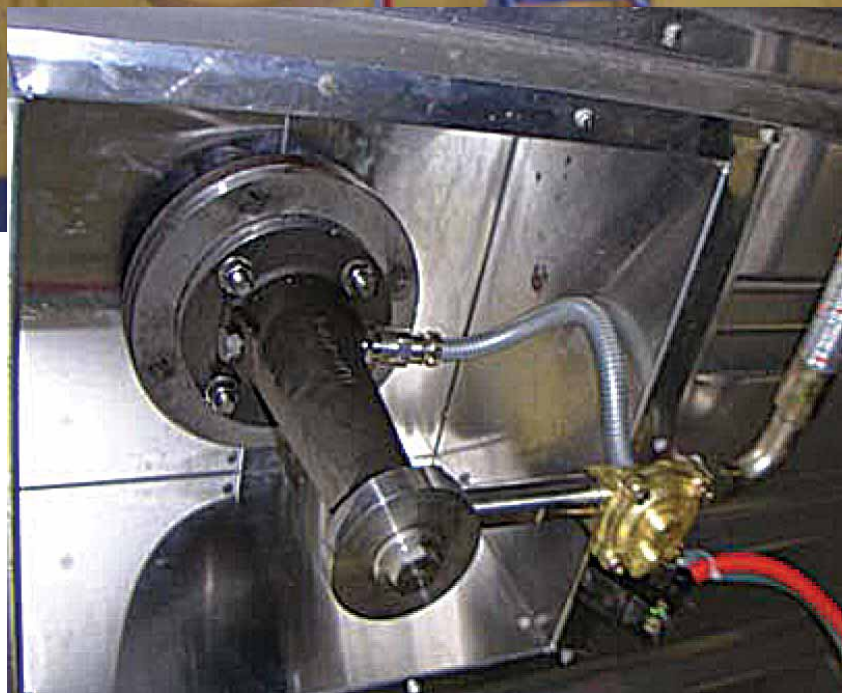
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ACOUSTIC PYROMETER - AGAM



from

**BONNENBERG
+ DRESCHER**
Projektentwicklung



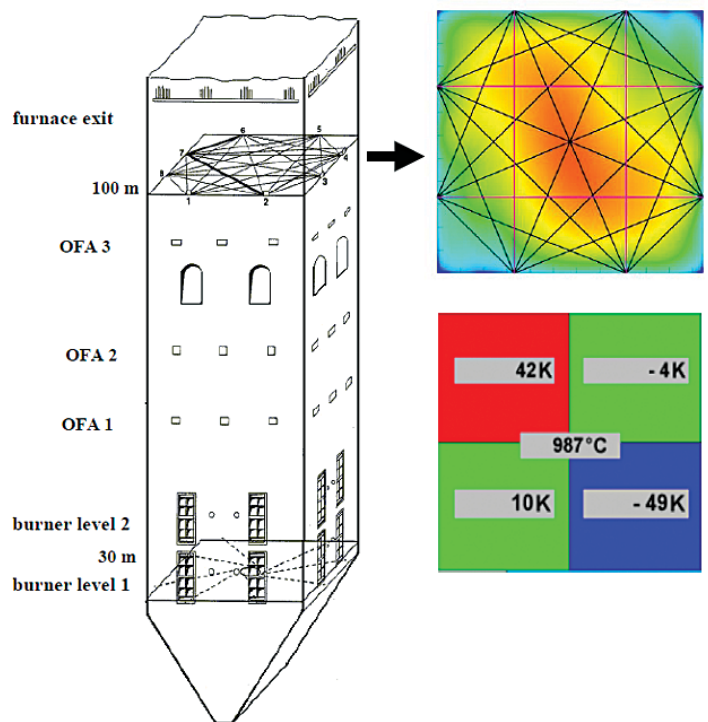
True temperature
up to 2000°C

Introduction

The Acoustic GAs temperature Measuring system (AGAM) is an advanced industrial instrument that provides fully automatic measurement of high combustion gas temperatures within boilers and furnaces. The system is completely non-intrusive in the hot gas stream and operates on the principal that the speed of sound is proportional to the square root of the temperature. Due to the measurement principle, AGAM instantaneously measures the true physical gas temperature, without being effected by radiation of hot burner flames or cold boiler walls. The system measures the flight time of a sound pulse over a known distance between identical transmitter and receiver units (transceiver) which are located on boiler openings. Plant air serves to produce the required sound impulse and keeps the opening free of fly ash. Multiple paths configurations between combined operating transceiver units are used to calculate two dimensional temperature distributions which are displayed as isothermal contour maps and graphic maps of zone temperatures.

Features

- True gas temperature measurement up to 2000 °C
- No radiation faults, no drift
- Non-intrusive and fully automatic
- Equivalent to a full HVT traverse
- Flexible configuration
- Simplified installation
- Automatic recovery after power loss
- Operates on units fired with any fuel
- Affordable, reliable, proven technology

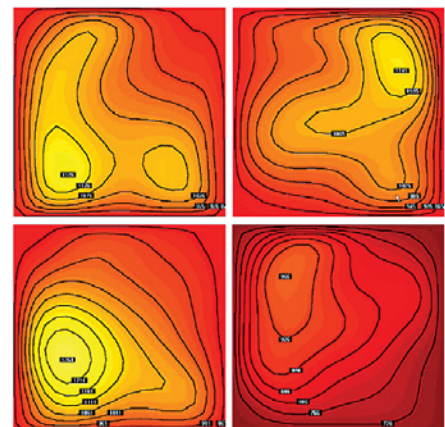


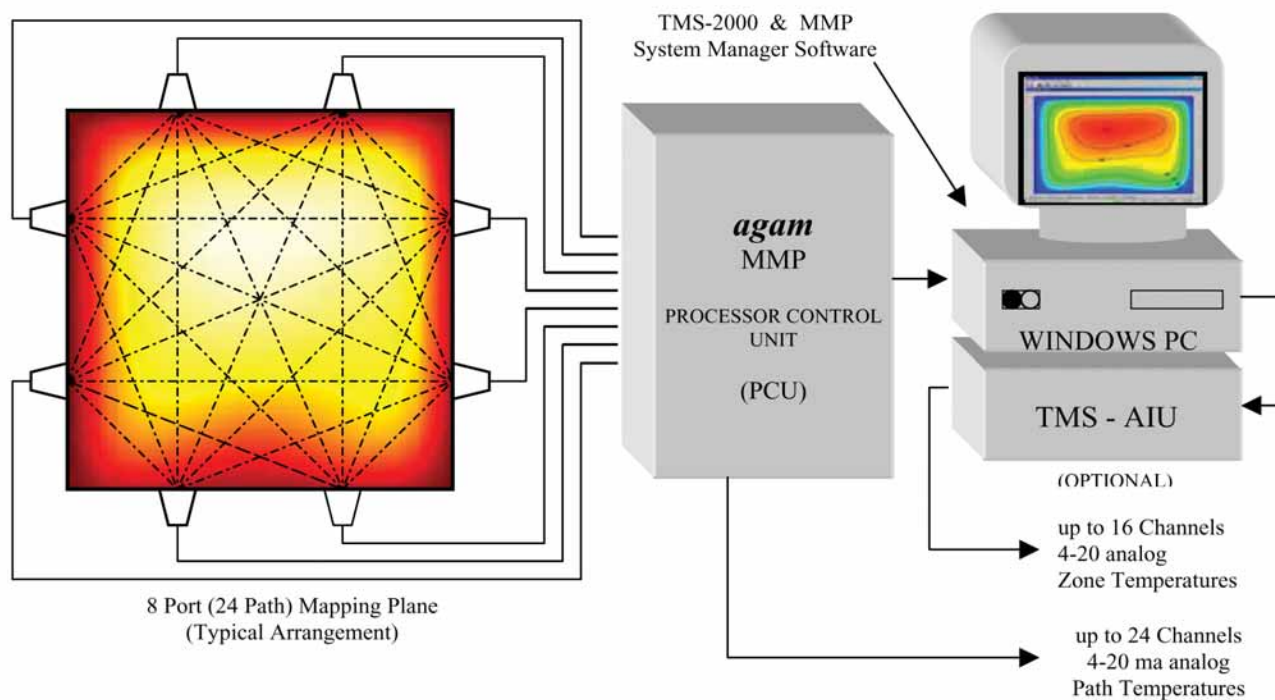
Benefits

- Protect boiler tubes from thermal stress; extend service life, prevent tube leaks
- Reduce forced outages, lost generation, and replacement power purchases
- Optimize soot blowing; reduce use of steam/air, less tube fireside corrosion
- Increase operating efficiency and heat-rate
- Reduce NOx by eliminating over-temperature conditions
- Use of the fast signal for fire capacity control in waste to energy plants reduces fluctuation in temperature and steam and serves to increase throughput

Applications

- Furnace exit gas temperature
- Balancing control
- Combustion Capacity Control in waste to energy
- Economizer exit gas temperature
- Soot blower optimization
- Thermal Probe Replacement
- Minimum Temperature Compliance (refuse/hazardous waste)
- Burner Balancing-Replaces cumbersome HVT traverses
- Fossil fired utility power boilers, chemical recovery units, waste-to-energy, hazardous waste incinerators
- Industrial kiln process monitoring
- Steel and glass processes





Specifications

Number of Ports:	up to 16
Number of Paths:	up to 96
Measurement Range:	up to 2000 °C
Resolution:	10 °C at 1000 °C for 10 meter path
Accuracy:	Better than 1.5 %
Measurement Acquisition Time:	3 seconds per transmission (e.g. 6 paths at a time)
Data Output.	analog current loop outputs or digital outputs (Ethernet, Bus) for zone temperatures, path temperatures, alarms, others
Acoustic Sound Generation:	Pneumatic sound generation driven by plant general service compressed air (instrument air not required)
Air Pressure to Sound Source:	5-8 bar
Control Unit (PCU)	
Ambient Air Temperature:	+60 °C maximum
Enclosure:	800 x 1000 x 400mm (Rittal CM 5115.500)
Weight:	70 kg
Transceiver Waveguide	
Material:	horn, casted stainless steel 1.4539piezo microphon, hastelloy C276
Dimensions:	190 mm flange diameter, 310 mm length
Flange:	DN 80 / PN 6
Weight:	12 kg
Temperature Environment:	Flange (microphon): +230 °C max.;+70 °C, max at solenoid valve
Transceiver Pre-Amp Enclosure	
Ambient Air Temperature:	60 °C maximum
Enclosure:	Steel, 300 x 200 x 155mm IP66, weight: 4.50 kgoptional fiber glass
Weight:	6 kg

Power plants using AGAM

- **EVONIK**
Kraftwerk Herne, Block V, 500 MW coal, Mapping system at furnace exit
- **EVONIK**
Modellkraftwerk Völklingen, 150 MW coal, Mapping system at furnace exit
- **Vattenfall Europe Generation AG**
Lippendorf, 2 x 930 MW lignite, Mapping systems at furnace exit
- **Vattenfall Europe Generation AG**
Schwarze Pumpe, 2 x 800 MW lignite Mapping system at furnace exit
- **Vattenfall Europe Generation AG**
Boxberg, 1 x 900 MW lignite, Mapping system at furnace exit
- **EDF – Electricité de France**
Kraftwerk Le Havre, Tranche 4, 600 MW coal.
- **Nordjyllandsvaerket, Denmark**
415 MW, coal, mapping system
- **ENEL, Italien**
Power plant La Spezia, 600 MW, hard coal, mapping system
- **ENEL Bulgarien**
Maritza East 3, 210 MW, lignite, mapping system
- **RWE Power AG**
Kraftwerk Weisweiler, 150 – 600 MW, lignite, mapping systems
- **E.ON Kraftwerke GmbH**
Kraftwerk Buschhaus, 390 MW, lignite, mapping system



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