

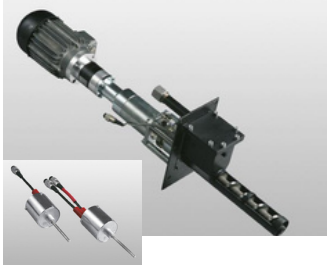
# Monitoring Solutions for Power Generation



## Combustion Control

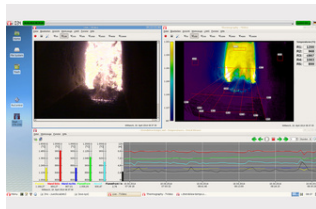
Fundamental for power generation is a proper control of the combustion process. Control must be based on representative monitoring of O<sub>2</sub> and CO content in flue gas. Conventional O<sub>2</sub> monitoring near to economiser is not sufficient for effective control of individual burners.

Only a simultaneous O<sub>2</sub> and CO monitoring can provide representative information for combustion control. TDL based optical instruments are optimal for multiple burners monitoring.



## Advanced Boiler Plant Process Control

Air and coal powder mass flow in boiler duct differ significantly. Monitoring of primary, secondary and tertiary air flow together with unburned content in ash allows an overall process optimisation. ECM is offering also expertise to assess and optimise the combustion process.



## Thermography

Thermographic camera systems allow monitoring of proper operation of individual burners and prevent damaging of boiler membrane by overheating. Number of camera systems depends on burner configuration.



## DENOX Monitoring

Ammonia slip should be monitored downstream the location where the chemical reaction ends. For these locations high temperatures and ash concentrations are characteristic.

Common problem of DENOX systems are plugging caused by ammonium bisulphate (AbS) condensing on air heaters cold end surfaces and causing a high pressure drop and corrosion.

Continuous monitoring of AbS and acid dew point allows to increase boiler efficiency and prevent unscheduled plant shut downs.



## Continuous Emission Monitoring (CEMS)

European legislation requires continuous monitoring of emissions. These are usually SO<sub>2</sub>, NO<sub>x</sub>, CO, CO<sub>2</sub>, O<sub>2</sub>, particle and flow.

Monitoring can be extended to HCl, HF, NH<sub>3</sub>, TOC, and mercury compounds. The devices must meet the QAL1 certification conditions.

CEMS data systems must be reliable, secure and fulfill all the regulatory requirements.



## Thermal Conductivity Based Flow Meters

QAL 1 certified mass flowmeters are an ideal solution for monitoring of wet and dirty gases including those with water droplets or abrasive media with high solid content. Probe for larger duct diameters can be equipped with several sensors. Even low flowing gas streams can be monitored with high accuracy.



## Desulphurisation Monitoring

On FGD inlet SO<sub>2</sub> mass flow and particle concentration is monitored. On outlet CEMS installation is required. Since most of FGD units include a wet scrubber, for particle monitoring a heated bypass particle monitor has to be used. Water content in the flue gas is evaporated before optical analysis of the dust content is performed.



## Boiler Water

Most demanded boiler water monitoring parameters are conductivity, hardness, silica, phosphates, sodium and hydrocarbons. Particle monitoring is identifying filtration problem and can indicate corrosion. Boiler water monitoring systems consist from cooling, pressure reduction and from the actual analytical part.



## Monitoring of Filtration Systems

Baghouse monitoring systems allow easy identification of defective sleeve. This monitoring helps effective maintenance planning and significantly prolongs sleeve life expectancy. Tribo sensors on the baghouse outlet are matching cleaning cycles to instant dust concentration for indication of failing filter units.





## Cooling Towers

Warm water in cooling towers is ideal environment for growth of Legionella bacteria. Bacteria can be identified by bio layer sensors stimulating internal bacteria growth. Output of the sensor is proportional to probability of bacteria growth on cooling tower surfaces. Information can be used for activation of disinfection.



## AllScan Coal Analyzers

AllScan monitoring systems installed above coal transportation belts allow to monitor simultaneously moisture, ash, calorific value, sulphur, volatiles and other elements in transported coal. This analysis allows optimization of combustion process for respective coal conditions.



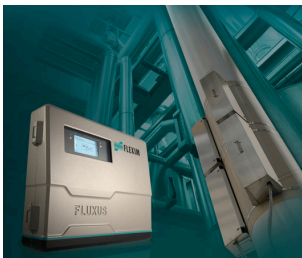
## Flame Monitors

Flame scanners using UV, VIS, IR spectral ranges allow safe operation of burner systems. Using of flame scanners is a safety issue for operation of boiler systems.



## Ignitors and Pilot Burners

Ignitors and pilot burners allow to start and maintain the combustion process. Design of ignitors is optimised for respective fuel.



## Clamp- on flowmeters

Flexim clamp-on instruments are a smart solution for a broad range of applications, like flow of steam, compressed air, natural gas and transfer.



## Portable Flue Gas Analyzers

Purpose of these instruments is flue gas testing and proper setting of boiler systems. Rugged instruments designed for harsh industrial environment allowing remote communication.

