

# THERMAL POWER: COAL

## CUSTOMER PROCESS BROCHURE

- World-leading combustion measurements improve burner efficiency to save up to 4% of fuel costs

- Servomex helps meet and monitor your lower NO<sub>x</sub> and SO<sub>3</sub> emissions targets

- Cost benefits include reduced maintenance requirement and improved quality by-products

Coal-fired power generation is a demanding industry: operators need to deliver the best possible process efficiencies while maintaining safety, controlling fuels costs and meeting emissions targets.

Servomex is the expert partner for a total gas analysis solution for coal-fired power generation. Supported by our expertise and experience, our analyzers deliver cost, process, safety and emissions benefits across all aspects of your process.

The precise monitoring and control of your furnace is crucial for optimizing combustion efficiency, minimizing fuels costs and reducing emissions. Our cutting-edge combustion gas analyzer meet the challenge directly by saving up to 4% of fuel costs, lowering emissions and maintaining the highest standards of safety. Our emissions analyzers offer your plant reliable and trustworthy monitoring of your output, while our TDL laser technologies offer effective slippage control in deNO<sub>x</sub>

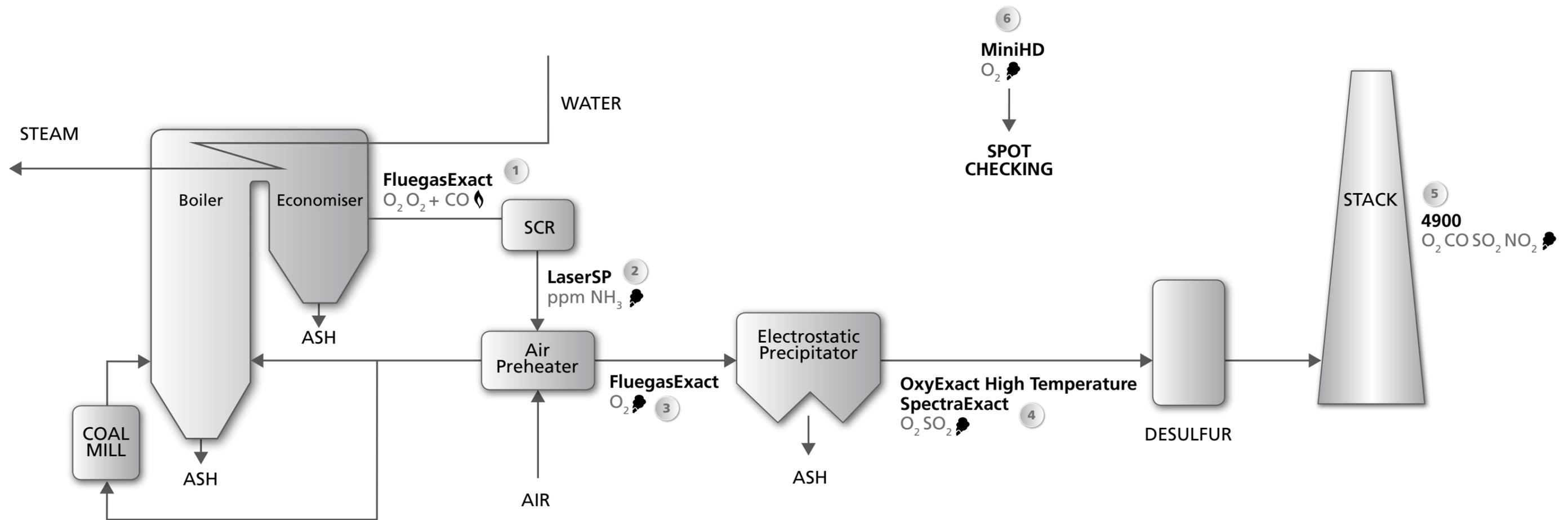
processes, helping ensure the quality of resellable by-products.

Our analyser systems not only improve your core processes but reduce maintenance costs, for instance for fuel-rich plants that suffer from increased particulate level and reduced loading on NO<sub>x</sub> cleanup equipment.



# THERMAL POWER: COAL PROCESS APPLICATION MAP

KEY:  
APPLICATION  
TYPES:



## PROCESS DESCRIPTION

In coal fired power generation, pre-heated air and pulverized coal are fed into the boiler where combustion takes place. Because the combustion process is not perfect, excess air is required to ensure complete combustion. If the amount of air is excessive, combustion efficiency will fall through heat loss; if the process is run with excess fuel, not all fuel will be burnt. The **SERVOTOUGH FluegasExact 2700 (1)** continuously monitors the amount of oxygen ( $O_2$ ) and combustibles (COe) in the flue gas allowing operators to achieve optimum combustion conditions, reducing carbon and NOx emissions, saving fuel and improving safety in the process.

Following combustion, the lowering of harmful NOx emissions produced from the reaction of excess nitrogen ( $N_2$ ) and  $O_2$  during combustion is typically achieved by selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR). In this process, ammonia ( $NH_3$ ) is injected into the flue gas to react with NOx to form  $H_2O$  and  $N_2$ . The TDLS in-situ measurement of the **SERVOTOUGH LaserSP 2900 (2)** enables precise monitoring and control of  $NH_3$  concentration below the requisite 2ppm.

Following the ammonia slip measurement, the flue gas moves through the air preheater, where the air leakage across the preheater is measured by the **FluegasExact (5)**, and then onto the electrostatic precipitator which produces the fly ash. If the fly ash is to be sold for use in concrete, then the unburnt carbon content must be kept low; the use of the **FluegasExact (1)** to correctly control combustion efficiency in the boiler will result in the lowest levels of carbon in the fly ash. Once the fly ash is removed the flue gas may need the removal of high levels of SOx. This process often requires the measurement of  $O_2$  and sulfur dioxide ( $SO_2$ ) before the

process; these are measured by the **SERVOTOUGH OxyExact 2200** and **SERVOTOUGH SpectraExact 2500 (6)** before entering the desulfurization process.

Once the sulfur is removed, the flue gas is vented to the stack, where the **4900 (7)** delivers a comprehensive Continuous Emissions Monitoring (CEMS) solution for  $O_2$ ,  $CO$ ,  $SO_x$  and  $NO_x$ .

Finally, safety across the plant can be improved through the use of the **SERVOFLEX MiniHD 5100** portable  $O_2$  analyzer **(6)**, which enables spot checking for  $O_2$  levels across the power plant.

# COAL FIRED POWER GAS ANALYSIS SOLUTIONS

SERVOTOUGH

## FluegasExact 2700



**ADVANCED  
FLUEGAS  
ANALYZER**

SERVOPRO

## 4900



**CONTINUOUS  
EMISSIONS  
ANALYZER**

SERVOTOUGH

## OxyExact 2200



**SAFE AREA  
PROCESS O<sub>2</sub>  
ANALYZER**

SERVOTOUGH

## LaserSP 2900



**HIGH  
SENSITIVITY  
CROSS-STACK  
TDL ANALYZER**

SERVOFLEX

## MiniHD 5100



**INTRINSICALLY  
SAFE PORTABLE  
GAS ANALYZER**

SERVOTOUGH

## SpectraExact 2500



**PHOTOMETRIC  
MULTIGAS  
ANALYZER**

CPPG1 Rev. 0.08/14



**ANALYZERS**



**SERVICE**



**SYSTEMS**



**EXPERT**

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A MEASURABLE ADVANTAGE