



Pulverized Coal-fired Boilers

Industry: Power
Product: ZR22 and ZR402

Introduction

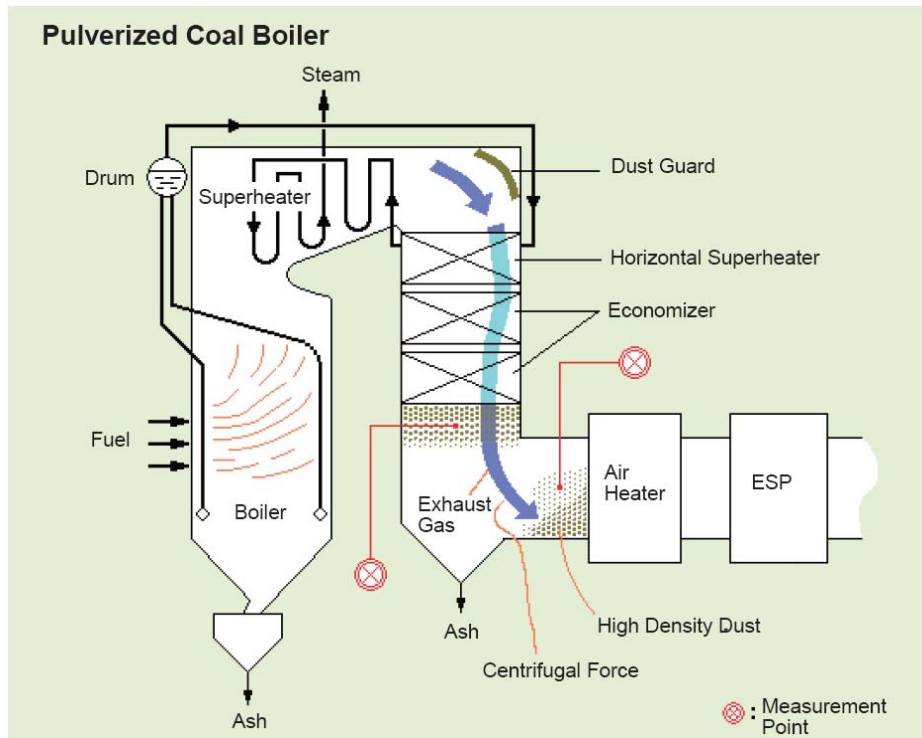
In a pulverized coal-fired boiler of a large power plant, an oxygen analyzer is essential for combustion control. A pulverized coal-fired boiler is an industrial or utility boiler that generates thermal energy by burning pulverized coal (also known as powdered coal or coal dust). This type of boiler dominates the electric power industry, providing steam to drive large turbines. Pulverized coal provides the thermal energy which produces about 50% of the world's electric

supply. Exhaust gases from the pulverized coal boiler contain a large quantity of dust and flow very fast. Oxygen analyzers that employ a sampling method may be subject to wear or clogging, resulting in increased maintenance workload and cost. A solution to this problem is the ZR22/ZR402 Direct In-Situ Zirconia Oxygen Analyzer that has no sampling system and utilizes a long-life sensor. A probe protector is attached to protection it against wear.

Process

While oil is commonly used as a boiler fuel, coal is also used because it is inexpensive and readily available. Unlike oil, coal produces a large quantity of ashes when it is burned; necessitating pulverized coal-fired boilers to be equipped with an ash removal system such as a cyclone. Exhaust

gases from these boilers contain a large quantity of dust (10 to 30 g/Nm³) and flow very fast as the result of the large volume of air being blown into the boiler. For oxygen measurement in large ducts, a probe with a long insertion length is used.



Features

- * Improves combustion efficiency for pulverized coal-fired boilers
- * Ensures stable, continuous oxygen measurement
- * Reduces operating costs
- * Minimizes the need for equipment replacement

Field Data

Process Conditions

Measurement point:	economizer outlet
Temperature:	300 to 400°C
Flow rate:	≤ 30 m/s
Pressure:	±1.5 kPa
Fuel:	pulverized coal

Product Recommendations

Sensor- ZR22 Oxygen Detector

Protector- ZR22R Probe Protector

Analyzer- ZR402 Oxygen analyzer
AV550 Oxygen Averaging Analyzer

Calibration-

- MC1 Single channel manual calibration unit
- AC1 Single channel automatic calibration unit
- IAC24 Integral automatic calibration unit
- AC4/AC8 Multi channel automatic calibration unit

Notes

- * A probe protector should be attached to the probe for protection against wear or damage. The probe protector should be mounted with the notch of the probe head pointing downstream in the gas flow.
- * It is recommended that the detector be installed with the probe tip pointing downward. As shown in the figure below, it may be installed horizontally, too. The probe head tip should not point upstream in the gas flow.
- * For more information contact the Yokogawa Analytical Marketing Department.

