

NO_x and O₂ Measurements by using Smart NO_x Sensor for Industrial Boiler

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Extended Abstract

In recent years, domestic and overseas industrial boilers have achieved high thermal efficiencies up to 90%. Industrial boiler manufacturers and research institutes are working to increase the thermal efficiency and reduce carbon monoxide (CO) and nitrogen oxide (NO_x) in a flue gas of boiler. Korea has been supporting subsidies for a low NO_x burner when nitrogen oxides in flue gas are lower than 40 ppm (4% O₂) for LNG burner, and NO_x concentration for lowest certified burner at 2016 in Korea was 8.8 ppm. But the burner characteristics are changed due to a variation of surrounding environment, burner aging due to an operation and so on. Therefore NO_x and O₂ concentrations can be changed with an operation time of burner.

By using Smart NO_x Sensor (Continental AG) which can measure NO_x and O₂, the possibility of using the sensor for measuring the oxygen concentration and the NO_x value simultaneously in a flue gas was confirmed in industrial boiler. The sensor precision was confirmed in a NO_x and O₂ standard gas before boiler installation. Results said that O₂ and NO_x output value of the sensor are 0.45 % and 49 ppm in a case of O₂ 0 % and NO_x 48.8 ppm standard gas. With the Smart NO_x sensor, flue gas concentrations in an industrial boiler were measured and compared by conventional flue gas analyzer (Testo 350). The smart NO_x sensor has faster responsibility than the flue gas analyzer due to an insert type characteristic. With the sensor, real-time control O₂ and NO_x of flue gas can be obtained by using flue gas recirculation, combustion air fan control system and burner geometry control.

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