

Measurement of O₂ Concentration in Hot Blast Stoves Essential to Improving Combustion Efficiency

Introduction

In a hot blast stove, the by-product gas produced in a coke oven is burned to preheat the air blast for the blast furnace. To improve the combustion efficiency and conserve energy in a hot blast stove, it is essential to be able to control combustion by measuring and adjusting the oxygen concentration in the exhaust gases.

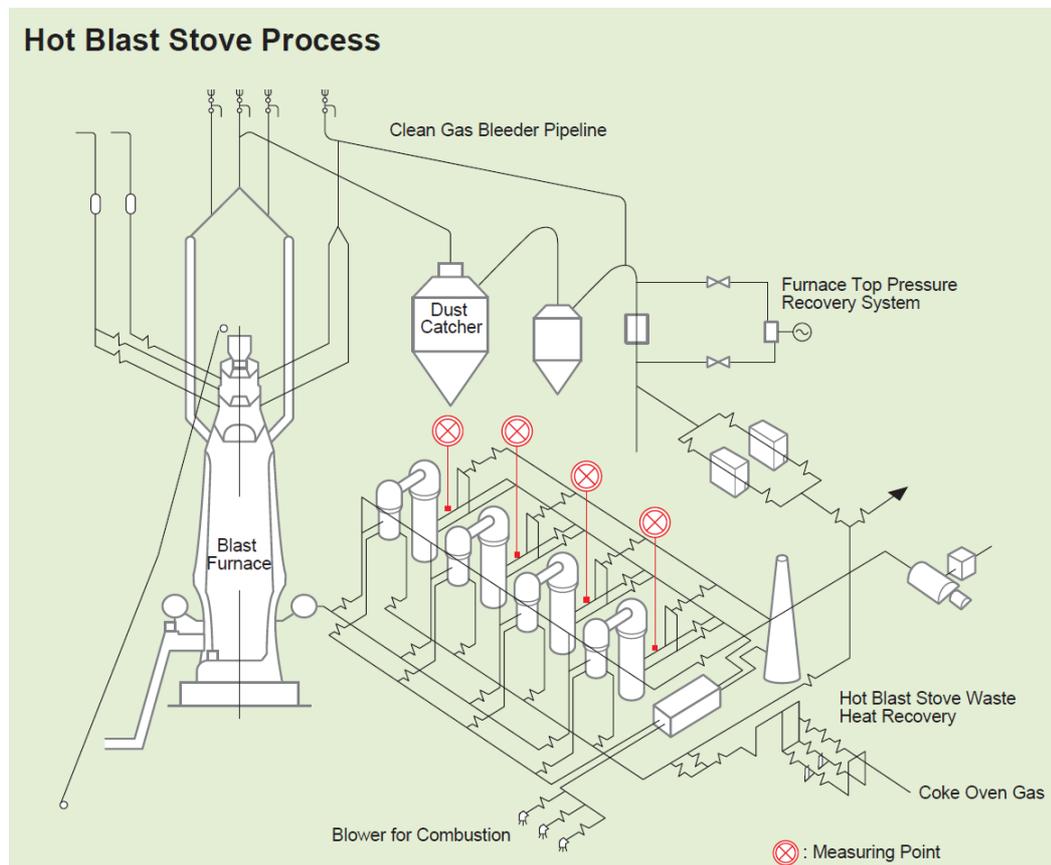
The ZR22/ZR402 Direct In-Situ Zirconia Oxygen Analyzer is ideally suited for combustion control in hot blast stoves. It utilizes a long-life sensor.

Expected Benefits

- Improves combustion efficiency in hot blast stoves
- Ensures stable, continuous oxygen measurement
- Reduces operating costs
- Minimizes the need for equipment replacement

Process Overview

The temperature of the hot blast used in blast furnaces has been increasing every year and currently stands at around 1300°C. Under such circumstances efficient operation is achieved by such measures as increasing the calorie value of fuel gas, replacing the hot blast stoves more frequently, and recovering waste heat from gas. To further improve combustion efficiency and save energy, measurement of the oxygen concentration in exhaust gases is required.



Solution Details

Process conditions

Measurement 20 to 350 °C
 Pressure point: Duct
 Temperature: 3.5 to 10 kPa
 Dust: 50 mg/Nm³
 Fuel: Gas

Measurement system

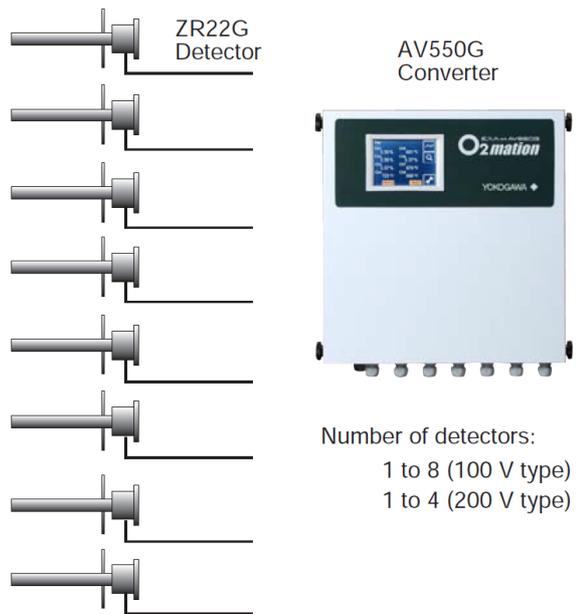
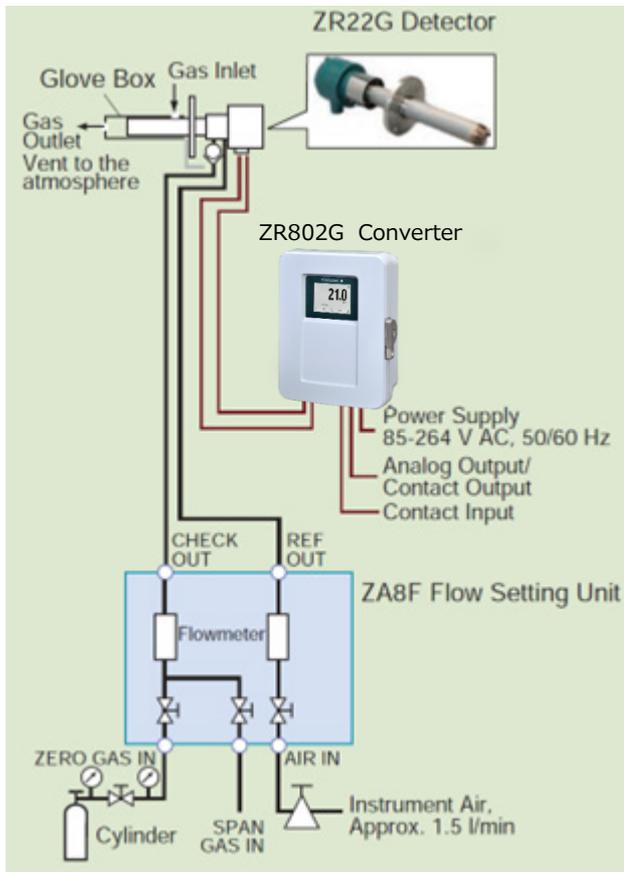
Detector: ZR22G-015-S-Q-E-□-□-E-A /CV/Z
 Z:Glove box option
 Converter: ZR802G-□-□-□-□-□ /□
 Flow setting unit: ZA8F-□*C
 Pressure regulator: G7013XF or G7014XF
 Case for calibration gas cylinder: E7044KF
 Note: the calibration gas cylinder must be purchased locally

Utilities

Rated voltage: 100 to 240 V AC
 Rated frequency: 50/60 Hz
 Power consumption: 330 VA (Max. 800 VA)
 Instrument air (reference gas) pressure: 300 to 700 kPa

Notes

- The detector is installed in a glove box to reduce the sample gas pressure.
- When more than three detectors are installed, it is recommended that the AV550G Averaging Converter be used instead of the ZR802G converter. The AV550G accepts signals from up to eight detectors.



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