

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

Industry: Iron and Steel

Product: Zirconia Oxygen Analyzer

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.

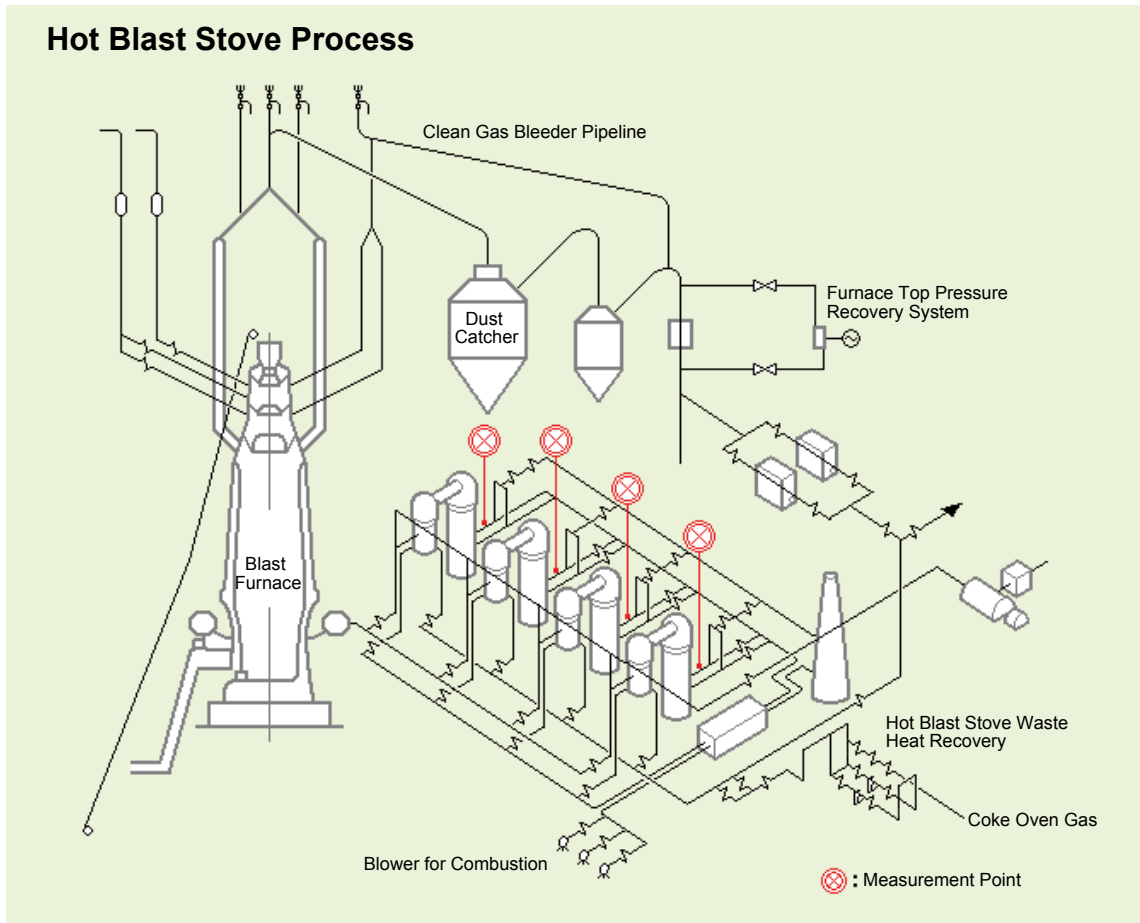
The ZR22/ZR402 Direct In-Situ Zirconia Oxygen Analyzer is ideally suited for combustion control in hot blast stoves. It utilizes a long life sensor.

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.

Expected Benefits

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



Solution Details

Field Data

Process conditions

Measurement point: duct
 Temperature: 20 to 350 °C
 Pressure: 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:

ZR402G-□-E-E-A

Flow setting unit: ZA8F-□*B

Calibration gas unit

Pressure regulator for gas cylinder:

P/N G7013XF (inlet W22, outlet Rc1/4) or P/N G7014XF (inlet W22, outlet 1/4NPT)

Case assembly for calibration gas cylinder: P/N E7044KF

Note: the calibration gas cylinder must be purchased locally

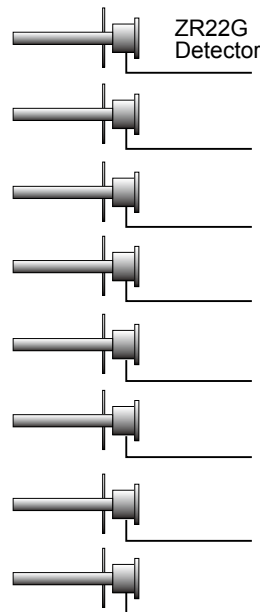
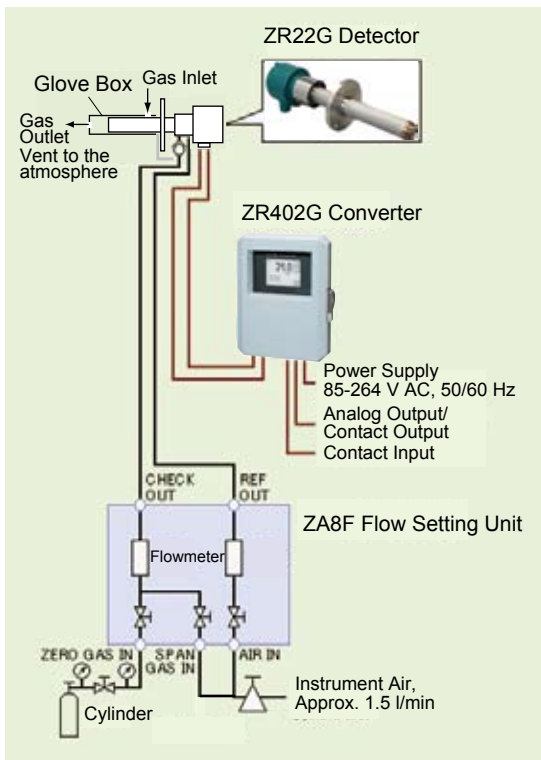
Utilities

Power supply: 85 to 264 V AC, 50/60 Hz

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 ZR402G converter. The AV550G accepts signals from up to eight detectors.



Number of detectors:
 1 to 8 (100 V type)
 1 to 4 (200 V type)