Introduction

There are various methods for continuous fabric dyeing as well as dye fixing. When dye is directly applied, steaming (heat treatment) is required. At present the pad-steam method is widely used for continuous dyeing. To ensure stable product quality, the humidity in the steamer is kept at a constant level. The ZR402G/HS Direct In Situ Zirconia High Temperature Humidity Analyzer provides excellent maintainability as it does not require the use of a sampling system, and ensures stable measurement in high temperature environments. It has been well received in the marketplace and is widely used in humidity control applications.

Expected Benefits

- Maintains the quality of the discharge process
- Ensures stable, continuous humidity measurement
- Reduces operating costs

Process Overview

The pad-steam dyeing process uses vat, reactive, acid, disperse, and other types of dyes, and includes padding, drying, fixing, washing, and re-drying steps. After padding, the fabrics are forwarded to a steamer where the dye is fixed under conditions of constant temperature and humidity.

Humidity Measurement in a Steamer

![Diagram of a Steamer with Humidity Measurement](attachment:image.png)
Solution Details

Field Data

Process conditions
- Measurement point: Steamer side
- Sample gas component: Steam: 90 to 100%; air: remaining
- Temperature: 70 to 110 °C
- Pressure: 10 to 30 kPa
- Dust: Non

Measurement system
- Detector: ZR22G-\assy-H-C-R-\assy-E-A/SV
- Converter: ZR402G-\assy-E-A/HS/\assy
- Standard gas unit: ZO21S-\assy-E*A

Utilities
- Power supply: rated voltage: 100 to 240 V AC
- operating voltage range: 85 to 264 V AC
- rated frequency: 50/60 Hz
- operating frequency range: 45 to 66 Hz
- Power consumption: approx. 100 VA (300 VA max.)

Notes
- It is best to install the detector vertically with the probe head pointing downward, but it can also be installed at any angle between 0° and 90° (horizontal installation shown right) with respect to the vertical.