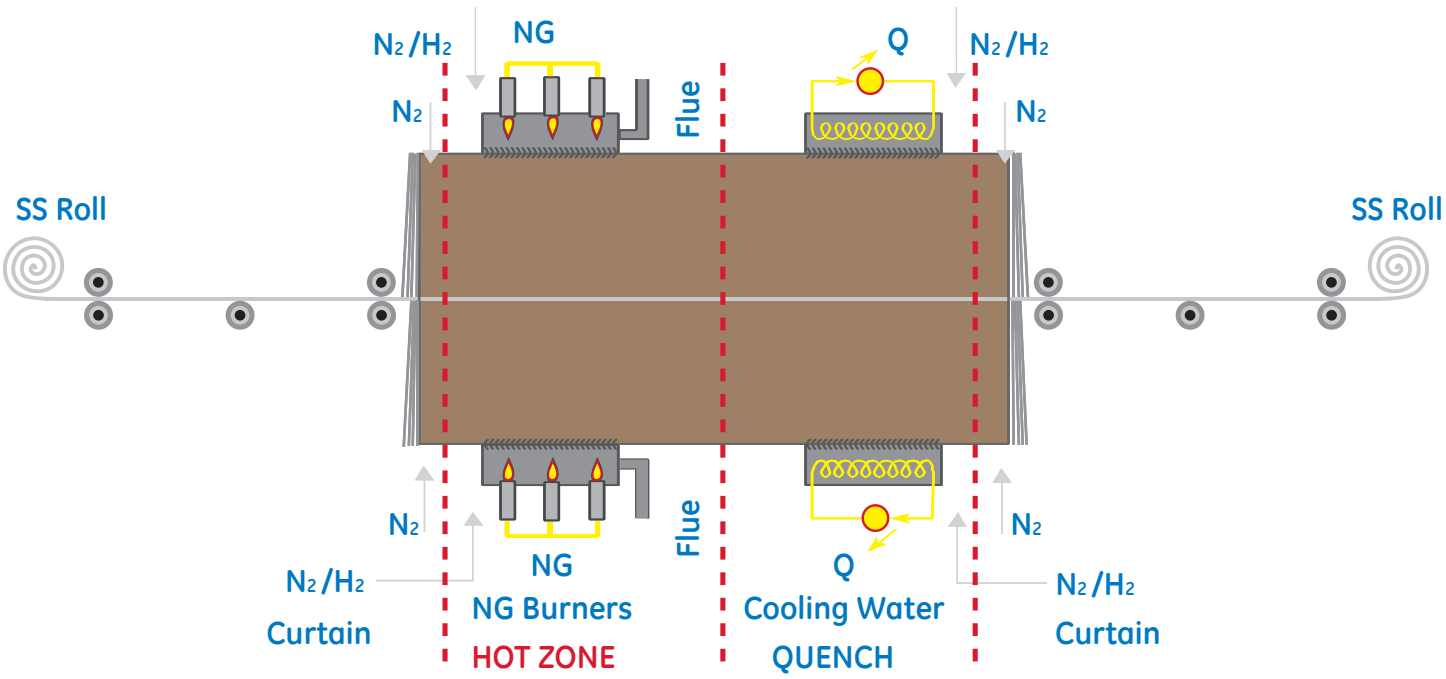
Heat Treating H_2O, H_2, O_2 Analyzer Solution



What is it?

In many heat treating operations, the atmosphere must be carefully controlled, specifically the levels of water vapor, oxygen, and hydrogen are critical to process efficiency and product quality. Examples include annealing (bright annealing for automobile parts and sheet metal), galvanizing, aluminizing, and brazing. Moisture and oxygen must be controlled to prevent oxidation, while hydrogen is used to reduce the metal oxides and serves as a quenching or cooling medium. Hydrogen and oxygen must also be closely monitored when the furnace is opened and purged with N_2 to prevent creation of an explosive atmosphere.

How to make measurements?

While there are many technologies available to measure moisture, by far the most advantageous for furnace applications is TDLAS. With the Aurora, you get superior speed of response, high accuracy, superior repeatability, and minimal maintenance. The analyzer never needs to be recalibrated and is immune to sample impurities which can cause contact-based sensors to drift. Little to no maintenance makes the total cost of ownership of TDLAS competitive with most contact-based sensor technologies.

Depending on the specific application, measurement of oxygen can be provided with several different types of sensor technology. For measurement ranges of 0.1% to 100%, the most preferred technology is the thermoparamagnetic oxygen sensor. Leveraging the benefits of this technology, the XMO2 has no moving parts, is corrosion resistant, includes automatic background gas compensation and is maintenance free. For low percent and ppm range measurement ranges, the oxy.IQ analyzer utilizes an advanced galvanic fuel cell sensor in two-wire loop powered transmitter. The oxy.IQ has long life span with low power requirements and requires little maintenance thanks to the self-contained cell. For higher accuracy, the Delta-F oxygen analyzer utilizes a unique, coulometric sensor technology which incorporates a non-depleting anode so there is no drifting over time.

By far, the preferred method for measuring hydrogen in furnace applications is with a thermal conductivity analyzer such as the XMTC. The XMTC provides optimized reaction processes with improved efficiency and increased process uptime.

Just as the sample system brings all the sensors together into one measurement system, moisture.IQ can bring the sensor outputs into one analyzer for display and process control. The moisture.IQ can input aluminum oxide sensors for any additional points of measurement, drive the oxy.IQ and/or the Delta F sensors, and can accept the analog outputs of the XMO2 and XMTC (separate 24 VDC power supply required). The display provides all the measurements at-a-glance with colors indicating any fault conditions. The moisture.IQ also provides analog outputs and alarm contacts, data-logging of all incoming measurements, and digital Modbus output for remote monitoring and control. You may locate the moisture.IQ in the control room, or panel-mount it through the door of the sample system.

Why a Combined Solution?

Built on a strong foundation of moisture and oxygen expertise from Panametrics, GE can provide all three measurements which can be custom built into a single sample handling system, an example of which is shown. Not only does this reduce the footprint in the field, but can also reduce the initial and recurring maintenance costs by providing a one stop shop solution.

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