

XTC601 Binary Gas Analyzer for use in Furnace Gases:

Heat treating is a range of processes designed to alter or achieve certain characteristics in different materials (metals). Heat treatment techniques include annealing, case hardening, precipitation strengthening, tempering and quenching.



The four key attributes that the plant is interested in are as follows:

- Ductility, Hardness, Strength & Surface Finish

Why use an XTC601 Binary Gas Analyzer?

The XTC601 Binary gas analyzer is ideally suited to measure H₂ in N₂. The presence of hydrogen serves two purposes in heat treating furnaces.

- The high thermal conductivity of hydrogen allows for very fast cooling and/or heating of the metal in the furnace. The H₂ concentration, the temperature and the rate at which the metal is fed to the furnace are all controlled and optimized. This allows the plant to produce the best product, for the lowest cost at the required quantities.
- Any oxygen present in a steel furnace will cause corrosion. A simple way of reducing the O₂ content is to consume the oxygen with hydrogen.

Continuous Type Furnace

In a continuous steel furnace there is usually a hot zone and a quench (cooling) zone. The hot section of the furnace is heated electrically or by natural gas fired burners. The quench zone has a series of cooling water pipes. At the inlet and outlet of the furnace there is generally a nitrogen "curtain" which prevents large amounts of air (containing oxygen and moisture) to enter into the heating or quenching zones. It also prevents hydrogen mixing with air outside the furnace and creating a potentially explosive atmosphere.

The XTC601 can be used to measure the hydrogen concentration in either the heating or quenching zones of the furnace or even the hydrogen / nitrogen feed gas to the furnace.

Bell Type Furnace

Another type of furnace is a bell type furnace. This is a batch furnace that is typically used for sheet steel, cable and wire spools or smaller parts. The parts are stacked on a base plate and then the bell furnace is lowered over them. Air is trapped inside the bell when it is first lowered, so it is necessary to purge the bell furnace with nitrogen until the oxygen concentration is below a certain limit (this can be monitored with an XTP601). The bell furnace is then filled with the hydrogen / nitrogen atmosphere and allowed to treat for whatever time interval is required.

A two port version with a Viton O-ring and user selectable cable gland accessories would be ideal.

Typical Ranges:

0 – 10%, 0 – 25% & 0 – 100% H₂ in N₂.

Related Products:

XTP601, Optidew, S800RS



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