

High Temperature Applications Hydrogen Process Gas Analyzer

Basics and background

The CONTHOS 3TCD HT is a high temperature thermal conductivity gas analyzer specially developed by LFE for on-line monitoring based on extractive methods for hot and wet gas analysis in process industry applications.

The technical features of the CONTHOS 3 TCD HT gas analyzer open up new areas of application for the thermal conductivity principle for

measurement of hot and wet sample gases where “cold” extractive analysis methods cannot be considered.

This includes all applications where the use of a sample gas cooler would lead to losses of soluble gas components thus leading to falsification of measuring results. Salification is another cause of erroneous results.

Solutions – Use of high temperature H₂ process gas analyzers

The purpose for high temperature determination of hydrogen in process gases is to measure in thermostat controlled applications with high dew-points without removing water vapor. Another issue for use of a thermostat-controlled analyzer is to avoid the formation of salts through acidic and alkaline sample gas components.

The high temperature version includes the complete thermostat control of the TCD detector as well as all gas paths and connectors within the analyzer for temperatures above the sample gas dew-point in conjunction with external heated gas lines for gas inlet and gas outlet.

In several metallurgical applications such as nitriding or carbonitriding with ammonia, carbon dioxide and water vapor require a high temperature analyzer to avoid dew point problems or ammonia salt precipitations in the sample gas lines. Chemical processes with hydrogen and acidic and alkaline components such as Cl₂, HCl, H₂O or NH₃, CO₂, H₂O and H₂ require a HT solution or wet process control with hydrogen, water vapor and high dew points.

The hydrogen component can be monitored with a CONTHOS 3 – TCD HT gas analyzer or a TCD module in a high temperature analyzer.

The highly corrosion resistant thermal conductivity detector with aluminum oxide ceramic, glass and quartz coated platinum measuring filaments enables a very good long-term stability for this measurement over several years. Stainless steel tubing can be provided as high pressure and high temperature versions enabling a very gas-tight measurement.

For hazardous areas a CONTHOS 3 - TCD Ex p with ATEX compliant Ex p system is available as well including an infallible containment.



Conclusions

The special performance and resistance of the CONTHOS 3 -TCD HT for analysis of H₂ with flexible measuring ranges helps to monitor and analyze the H₂ content based on an extractive method for hot and wet gas analysis

in process industry applications. This enables the continuous control of the production and quality control leading to optimal process performance.

LFE Process Analytical Instrumentation
Am Germanenring 54
D-63486 Bruchköbel / Germany
Tel.: +49 6181-495302 | Fax: +49 6181-493807
www.LFE.de

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