Flame Ionization Detector Capabilities

The Flame Ionization Detector (FID) is a widely used detector in gas chromatography. Its linear response to hydrocarbons over many orders of magnitude lends significant analytical capability to numerous routine gas analysis applications. The FID used in AMETEK Process Instruments' Trace Analytical™ gas purity analyzers is a very sensitive detector. It is used to detect traces of hydrocarbons and CO_2 in normal air constituents (O_2, N_2, etc.) and inert gases.

How It Works

The hydrocarbons in the sample gas are burned in a hydrogen flame to ionize the carbon atoms which then emit free electrons. These electrons are measured as a current that is in direct proportion to the concentration of the hydrocarbons burned. Normal air constituents, including CO and CO_2, do not emit electrons and therefore give no response to the FID. Consequently these gases do not interfere with the measurement. This lack of interference enables the FID to measure hydrocarbons at low ppb levels.

When a measurement of CO_2 is desired, a Methanizer is used to convert the CO_2 in the sample into methane which is then measured by the FID. The methane created and measured is in direct proportion to the CO_2 in the sample gas.

The Trace Analytical FID is an ultra sensitive device that, together with the Methanizer, enables the determination of CO_2, CH_4, and NMHC (non-methane hydrocarbons) in various gases such as Air, H_2, O_2, N_2, He and Ar. The typical lower detection limits of the FID range from <0.5 to 25 ppb for each listed compound.

When used to measure THC (total hydrocarbons), the FID equipped analyzer provides the total hydrocarbon measurement divided into methane and non-methane hydrocarbon concentrations. The FID can measure these organic compounds in other matrices as well when configured with an application-specific set of valves and columns.

Our applications group is always ready to consult with you about your specific analytical requirements. Please contact AMETEK Process Instruments or your local AMETEK representative for information on our line of FID-equipped Trace Analytical gas purity monitors.

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REGISTERED ISO 9001 MANAGEMENT SYSTEM

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One of a family of innovative process analyzer solutions from AMETEK Process Instruments.
Specifications subject to change without notice.