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Ingenuity for life



An industrial facility, possibly a refinery or chemical plant, is silhouetted against a bright, golden sunset sky. The sun is low on the horizon, creating a strong lens flare effect. The facility features several tall distillation columns and a complex network of pipes and structural steel. The overall atmosphere is warm and industrial.

Analytical Products and Solutions

Total VOC – Continuous Monitoring of Vent Effluents

To comply with regulatory monitoring requirements, plant waste effluent to atmospheric vents may have to be monitored. In addition to quantifying the volume flow, it may require the continuous determination of Total VOC, even measured as methane and non-methane hydrocarbon concentrations. On-line and automatic monitoring can economically ensure correct measurement and prevent loss of data.

Siemens Analytical Products and Solutions provides complete solutions for such applications.

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Measurement

Regulatory emission monitoring rules frequently require the monitoring of Total Volatile Organic Carbon (VOC) emission from vents or even some flares. The Total VOC concentration can be all hydrocarbons as methane+ (C1+) or more typically measured as methane and total non-methane hydrocarbons.

Solution

Although there are several measurement options, the on-line and automatic monitoring ensures unattended, economical and repeatable data generation.

Laboratory Sample

Triggered by preset parameters, such as exceeding a certain flow velocity of the vapor flow to the flare, a sample is extracted automatically every preset time period and manually analyzed in the laboratory.

Continuous Gas Analysis

A continuous FID analyzer can be utilized to determine Total VOC (C1+) and, by utilizing a catalyst, methane or total non-methane VOC respectively. Because such an analyzer is utilized at ppm concentrations and catalysts used for the methane measurement have a limited capacity, flows with concentrations in the higher percentage range may have to be diluted continuously.

A simpler solution, without dilution requirements is utilizing a FID without catalyst for the Total VOC measurement (C1+) and an IR analyzer, optimized for C1 measurement in a background of HCs, for the selective determination of methane.

Continuous Process Gas Chromatograph (GC)

For more precise quantification, an on-line process gas chromatography can be utilized. A single column train determines the concentration of methane as well as non-methane every 90 seconds in a simple manner. Further specific components of interest in the sample flow, such as H₂S can be accommodated as well and determined precisely.

To schedule a needs assessment or for more information, please contact:

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Due to the versatile electronic and communication capabilities, the Process GC can serve as the control center for the entire measurement requirements with the ability to observe system performance from any location.

How Can Siemens Help?

As a long time provider of analytical solutions, Siemens is uniquely qualified to assist your plant site in meeting these requirements. Siemens has a wide range of products and services available ranging from providing detailed upfront engineering assistance to assess your site's specific needs and provides the most suitable measurement solution, in providing optimized, tested and validated analytical systems, complete turn-key solutions as well as various maintenance services.

Depending on the analytical site needs and preference, the analytical solution could include a FIDAMAT Flame Ionization and ULTRAMAT IR analyzer for the determination of Total VOC and methane, or the MAXUM edition II Process Gas Chromatograph for the chromatographic determination of methane and total non-methane hydrocarbons. These analytical solutions can be provided individually, in stand alone cabinets or in small analyzer shelters.

Other analytical solutions, such as the additional measurement of H₂S or the continuous and on-line speciation of the individual hydrocarbons and the simultaneous determination of the BTU contents have been realized and are available.

All From One Company, All From Siemens.

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