ETA Associates

October 2010

Draeger Fixed Gas Sensors - *Jet fuel Vapor Measurement*

Jet fuel is relatively volatile and is stored at the rim of airports and remote locations in order to minimize the risk. The fuel is loaded from trucks or pipeline systems, both of which are ruled by very strict guidelines and inspections, into planes.

These fueling activities generate a considerable amount of vapor as the fuel is transferred in, the vapors in the tank are forced out through tank vents. Thus an explosive vapor-air mixture forms. At some point, the escaping fuel vapors will be within explosive limits, depending upon atmospheric conditions and the type of fuel involved.

Jet fuel detection can be implemented in three different areas: Storage area: Fuel leak monitoring at pumps and tanks; Transportation: Monitoring of pipelines and pump chambers; and Fuelling: Detection of escaping fuel vapors

Appropriately located gas detectors are advantageous in all areas as they are directly measuring the hazardous vapors. They are more sensitive and reliable for leak detection than conventional level or pressure methods which estimate the potential hazard indirectly. The Draeger Polytron IR, IR EX, and Pulsar offer a range of solutions to meet a specific locations needs.

Free Webinars

October 27, 12 pm:

Steam Trap Surveys - No Loss of Live Steam with Harold Gooding of iFacility Services

To participate, www.gotomeeting.com, code 656-079-370

October 28, 12 pm:

ANSI Z358.1 2009 Eye Wash/Shower Standard Requirements, Regulations & Recommendationswith Guardian

To participate, www.gotomeeting.com, code 268-094-130

November 9, 12 pm:

Emissions Testing with Portable Analyzers with Testo

To participate, www.gotomeeting.com, code 670-863-283

November 11, 12 pm:

Sensor Technology for Portable Gas Instruments with Honeywell/BW Analytics

To participate, www.gotomeeting.com, use code 492-803-499

Questions: eta@etaassociates.com or call (978) 532 1330.

Testo 330-iGLL - *Color Graphic Combustion Analyzer*

The Testo 330-1G LL, is combustion analysis without confusion. Redesigned with a full color graphic display, the 330-1G LL combustion analyzer allows the user to visualize the measurement data graphically without watching numerical values.

Self-explanatory graphic curves as well as easy to understand symbols and a clear color display ease the understanding of the measurement data considerably showing the user where they are at, and a trend line of where they are headed during the adjustment process.

Thumb symbols confirm instantly system status of O2 and CO concentrations in the green zone (safe & efficient) confirming operation falls within the manufacturers guidelines. User configuration allows the display of 4- to 8-lines as numerical values and 4 measurement values simultaneously in a line-graph display. This feature shows trends that may be compromising safe operation or fuel combustion such as depressurization of the combustion air zone, loss of draft, or fluctuating O2 due to potential heat exchanger failure

Features:

• 240 x 320 Color graphic display • Graphic processing of data • Self diagnostics • Gas standing pressure test • User defined fuels • Logger function for long term me asurement • Long life sensors (up to 6 years CO & O2) • 4 year sensor guarantee • Reduced cost of ownership • Memory up to 500,000 readings • USB interface for data readout to PC • Over 10 hours continuous operation

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Basics of Combustion Efficiency - *in Flue Gas Oxygen Analyzers*

The amount of oxygen is important to know in any combustion process as it involves reacting air and fuel. Stoichiometric combustion reacts all fuel with no excess O2. If an operator knows the amount of oxygen available in the combustion process they can optimize the fuel/air ration and improve combustion efficiency, thus saving money. It also minimizes NOx emissions and the correct emissions concentration for CEMS.

In ideal combustion, N2 from air does not react with the fuel. In real combustion the high flame temperature causes N2 to Oxidize forming NO. The way to reduce NO formation in flame is to reduce excess air - less free oxygen means less NO formation. Reducing the flame temperature reduces the reaction rate and uses staged combustion to reduce peak temperature.

Oxygen can be measured either with

- Zirconium dioxide -
- Electrochemical Paramagnetic
- Tunable Diode Laser

Applications

- Process heaters
- Oil refining
- Power generation
- Steel making
- Waste incineration
- Cement kiln
- Pulp & paper
- Any combustion procesa where efficiency matters.

In conclusion:

Specialized analyzers are available for almost any application – consider product lines w/multiple sampling techniques

Insitu analyzers are compact and simple to use

Close-coupled extractive analyzers are fast and are also suitable for high-temperature applications

Close-coupled diffusive analyzers are best where PM concentrations are high

FTIR - *What it is and how it works.*

In infrared spectroscopy, IR radiation is passed through a sample of gaseous molecules. Some of this radiation is transmitted through while the rest is absorbed by the sample, producing an infrared spectrum, or "molecular fingerprint". Because each molecular structure has a unique combination of atoms, each produces a unique infrared spectrum. From this, identification (Qualitative analysis) and analysis (Quantitative measurement) of the gas is possible, the two major applications of FTIR spectrometry or Fourier Transform Infrared Spectroscopy. An FTIR gas analyzer detects gaseous compounds by their absorbance of infrared radiation. It can simultaneously measures multiple analytes in a complex gas matrix, detecting virtually all gas-phase species (both organic and inorganic).

A Gasmet™ FTIR gas analyzer collects a complete infrared spectrum 10 times per second. Multiple spectra are co-added together according to selected measurement time (improving signal-to-noise ratio). The analyzers can perform simultaneous measurement of both organic and inorganic compounds, as well as analyze hot, wet and corrosive gas streams. Concentrations of up to 50 different compounds can be measured within seconds. Measurable gases include:

• Inorganics: H2O, CO2, CO, SO2, NO, NO2, N2O, NH3 • Corrosives: HCl, HF, HCN • Hydrocarbons: CH4, C2H6, C3H8. etc • Volatile Organic Compounds: Acids, Acetates (e.g. acetone), Alcohols (e.g. ethanol, methanol), Amines, Aromatics (e.g. benzene, toluene, xylenes), Aldehydes (e.g. formaldehyde), • FFCs and PFCs: SF6, CF4, C2F6, and • Waste Anesthetic and Sterilizing gases.

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