

Application Note: Verax™ Flare Gas Monitoring



The Real-time Measurement Solution for Flares

Designed to Meet BTU & Compositional Measurement Requirements

As federal, state, and local agencies expand monitoring and reporting requirements, many flare operators have begun evaluating and selecting analytical equipment. Flare gas measurement can be a challenging analytical application—the composition of the flare line can change rapidly, affecting the BTU value and requiring a fast response to maintain complete combustion. The JP3 Verax™ Near Infrared (NIR) analyzer system offers a reliable, real-time hydrocarbon BTU and compositional measurement with minimal cost of ownership.

Current Technologies are Expensive, Slow, or Both

There are many options for on-line flare BTU measurement, but it is important to carefully consider the benefits and drawbacks of each technology. Compared to other technologies like gas chromatographs (GC), calorimeters, or mass spectrometers, optical measurements like NIR offer advantages in rapidity, repeatability, ease of maintenance, and reduced emissions.

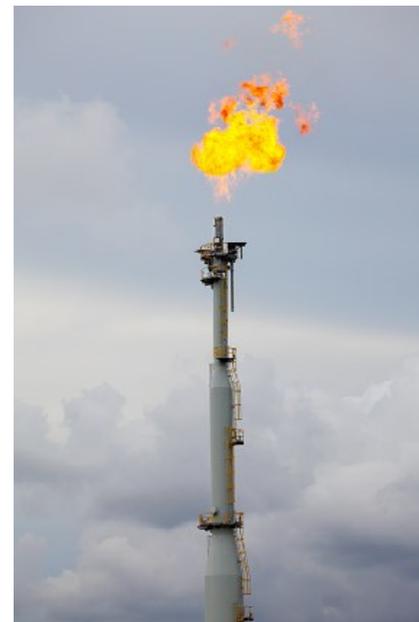
Minimizing sample handling and lag times are a major concern: filtering and coalescing the sample can change its composition, contributing error to the measurement; sample lag slows response time as the sample must move through the sample conditioning system to reach the analyzer. Having a fiber-coupled optical measurement helps avoid these pitfalls by not requiring a complex sample conditioning system or sample transport. Minimized sample lag combined with a 15-second measurement update means that results are provided in real time.

Optical measurements feature dramatically lower cost of ownership. There are no consumables to replenish, and maintenance requirements are minimal. Installation, commissioning, and long term maintenance are simplified compared to other options. In addition, with no sample conditioning and no sensor in contact with the process gas, the full volume of sample is returned to the flare line and there are **zero analyzer emissions**.

NIR Spectroscopy for Flare Gas Analysis

The JP3 Verax system uses an NIR spectrometer to determine the composition of a sample. The chemical composition of a gas determines its properties, such as BTU value, density, and Wobbe index. Therefore, with an accurate compositional correlation updated every few seconds, the Verax system helps flare operators meet federal, state, and local permitting and reporting requirements.

In addition to meeting regulatory needs, the rapid and accurate composition measurement of the Verax system can provide valuable insight into process conditions upstream of the flare. The ability to monitor process changes at the flare can accelerate identification of issues, saving valuable time and money. For just one example, if a valve is leaking to the flare, the Verax displays the compositional change, allowing operators to identify the source: if an increase in butane is indicated, operators can investigate butane-rich processes—instead of looking across the entire plant.



New Federal regulations will require most flares to monitor BTU and many to measure hydrocarbon composition.



Verax NIR Analyzer:
The ideal solution for simultaneous monitoring of BTU and hydrocarbon composition.



Critical Data. Real Time.

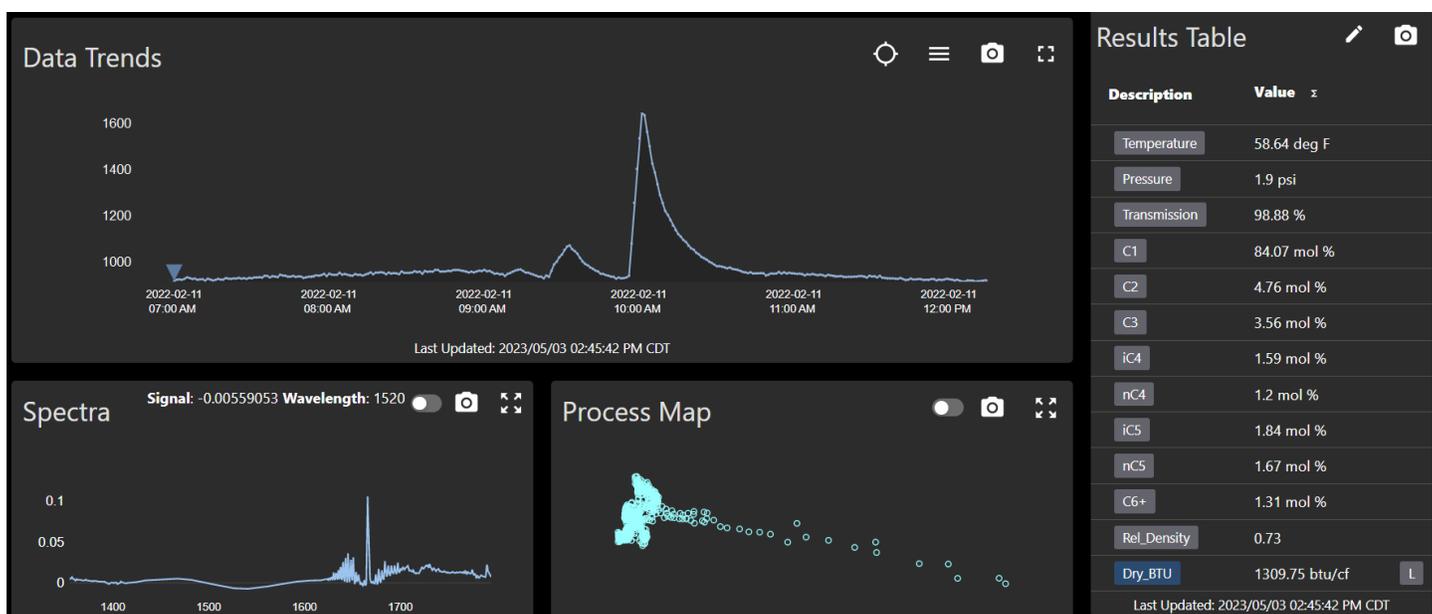
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Expert Service and Support, Tailored to Your Needs

A core concept at JP3 is service — our service team is dedicated to supporting our customers through remote monitoring and comprehensive on-site service, ensuring maximum uptime for every analyzer system. JP3's in-house team of project managers, field service engineers, and Ph.D. chemometricians offer a full range of support options to meet every capability and need.

Designed for Speed and Reliability

The highly reliable Verax analyzer provides analysis for up to four process streams in less than fifteen seconds per stream. Utilizing a highly stable and repeatable laser optical source, and packaged to operate in harsh environments with no shelter, the Verax operates in-line at process pressure and temperature. The VeraSight flow cells are mounted at the process points of measurement with fiber optic cable connections back to the control unit. All material is returned to the pipe, resulting in emissions-free operation. This means sample conditioning and transport systems are minimal and simple, which improves response time and safety.



JP3 Viper: Real-Time Web-Based Monitoring Software

Real-time monitoring with JP3 Viper

Every JP3 Verax user can monitor their systems in real time with Viper, a powerful web-based tool located in the cloud or in on-site infrastructure, depending on requirements. Viper allows for detailed monitoring of system health and trending of process data with an intuitive user interface.

In this example, the JP3 Verax system is displaying a BTU trend in which a large excursion is captured. The detailed breakdown of process composition, along with temperature, pressure, relative density, and BTU are displayed on the right for the current measurement (or a selected data point). On the bottom, the infrared spectrum and process map—an indication of how the spectra differ over the selected time period—are displayed.

Meet Requirements at Minimal Cost with JP3 Verax

Flare measurement and reporting requirements can be met economically by utilizing the speed, power, and repeatability of the Verax system. One Verax system can measure multiple properties on up to four separate streams or read points, all simultaneously. The Verax system is ideally suited for unattended field operation, compared to most other analytical technology options. JP3 Verax is designed for rugged, outdoor environments with an ATEX/IECEx or Class 1 Div. II rating and no purge or temperature control requirements. This keeps installation, commissioning, and fiber costs to a minimum.



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