

# Application Note: Verax™ Flare Gas



## The Real-time Measurement Solution for Flares

### Designed to meet BTU measurement requirements

Flare gas BTU 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 from the operator to maintain complete combustion. JP3 Verax™ Near Infra-Red (NIR) analyzer systems offer a real-time hydrocarbon BTU 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. Conventional solutions such as Gas Chromatographs provide slow measurement cycles, an issue exacerbated by lag times introduced by the required sample conditioning systems (SCS). Mass spectrometers provide rapid speciation and measurement, but similarly require sample conditioning and typically entail a high cost of ownership. Optical measurements like NIR, FT-NIR, and Raman offer advantages in rapidity, repeatability, and ease of maintenance. The JP3 Verax only requires a minimal SCS that measures directly on the fast loop—simplifying installation, commissioning, and long term maintenance.

### 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. Therefore, with an accurate compositional correlation, NIR spectrometer results can be used to model and measure ASTM reference standards, or any other measurement standard that is correlated with composition. Each Verax measurement produces diagnostic information that can be used to ensure the system is functioning properly.

### Meet Requirements at Minimal Cost with JP3 Verax

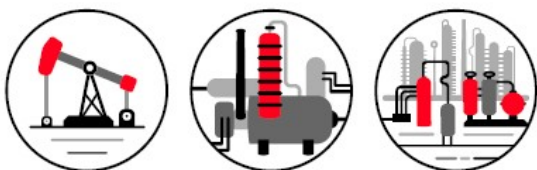
Flare measurement requirements can be met economically by utilizing the speed, power, and repeatability of the Verax system. One Verax system can measure multiple properties on up to four separate streams or read points, all simultaneously. Many other optical systems require a multiplexer to measure multiple streams: such a device contains moving parts and only measures one stream at a time, slowing overall measurement rates. FT-NIR and Raman systems are more costly than Verax. Not only is the base price for the instrument higher, they require a climate controlled shelter and a positive pressure purge. 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.



Per [40 CFR § 63.670](#), BTU at the flare tip must be reported for each 15-minute block of time.



Verax NIR Spectrometer



**Critical Data. Real Time.**

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## Expert Service and Support, Tailored to Your Needs

Almost all optical-based systems will require chemometric models, which are developed by chemometricians using process samples. Most other optical analyzer manufacturers rely on the end user to create, develop and maintain these calibration models. JP3's in-house team of project managers and Ph.D. chemometricians offer a full range of support options: from hardware-only sales to full-service model development and support.

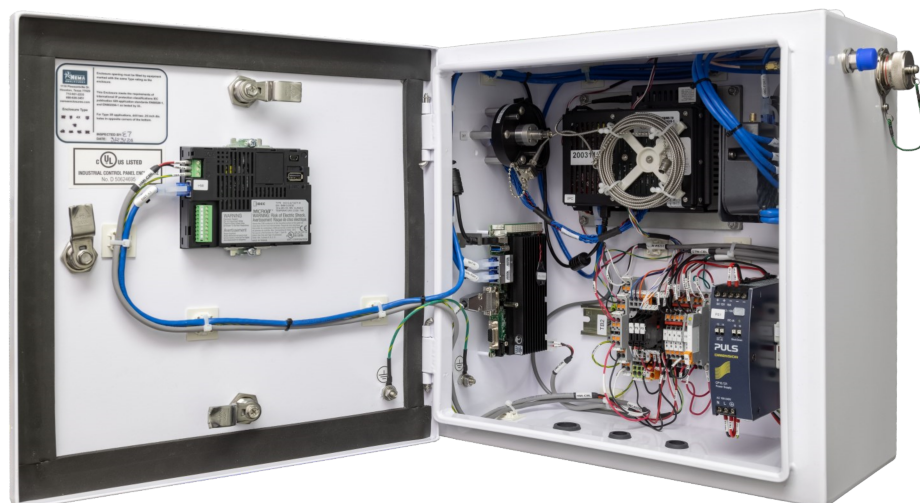
## Designed for Speed and Reliability

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.

## Comparison of Analytical Methods

Method	Response Time	Fault Tolerance	Multiple Property Measurements	Environmental Controls	Initial Cost	Cost of Ownership
Lab Sampling	>30 minutes	N/A	Yes	No	\$	\$
Gas Chromatography	5-15 minutes	Moving Parts Require Maintenance	Application Dependent	Required	\$\$	\$\$\$
Mass Spectrometry	Sample lag + 15 seconds	Pumps Require Maintenance	Yes	Required	\$\$\$\$	\$\$\$
Raman & FT-NIR	~1 minute	On-Board Computer Diagnostics	Yes	Required	\$\$\$\$	\$\$
JP3 Verax	15 seconds	On-Board Computer Diagnostics	Yes	No	\$\$	\$

JP3 Verax Gas Analyzer Product Info Links: [Verax SSG](#), [Verax CTX](#), [Verax ISX/IMX](#)



Verax SSG NIR Spectrometer



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