Verax ISX & IMX Analyzers

A Near-Infrared Analyzer for Real-Time Analysis

Single- or Multi-Stream, ATEX and IECEx Certified Analyzer System for Measurement of Hydrocarbon Composition, API Gravity, Vapor Pressure, BTU, Transmix, and Other Properties in Natural Gas, NGL, Condensate, Crude Oil and Refined Products

One Device Measures Composition and Properties of Gas and Liquid

The Verax ISX and IMX represents JP3’s latest generation of near-infrared analyzers designed specifically for oil and gas applications. With faster measurement times, up to four independent spectrometer detectors, enhanced optical components and a patented flow cell, the Verax ISX and IMX provide significant improvements in measurement speed, quality, repeatability, stability and reliability in even the harshest environments. Natural gas or liquids can be accurately analyzed to obtain hydrocarbon composition, API gravity, vapor pressure, BTU, transmix, and other properties.

The unit is highly reliable, requires no consumable materials, requires no sample conditioning, and provides fast measurements with extremely high reproducibility and repeatability. Older, less reliable and maintenance intensive technologies can now be replaced with confidence.

Single- or Multi-stream Systems to Reduce Cost Per Read Point

Verax ISX contains a single spectrometer and detector, while the Verax IMX features four spectrometer detectors. This flexibility allows a system to be designed to minimize the cost per read point. A single read point project can use the Verax ISX, while a multi-read-point project can use a Verax IMX.

Measure in the Pipeline at Operating Pressure and Temperature

The VeraSight flow cell is installed directly on the process at operating pressure and temperature, requiring no sampling or conditioning systems. The flow cell is connected to the analyzer by a single pair of fiber optic cables, allowing the analyzer to be located as close to or as far from the process as desired. Each process stream can support any number of compositional and physical measurements. The Verax analyzer produces no emissions and requires no carrier gases or calibration gases.

Solid State Spectroscopy for Rapid Response Time

Using patented Near-Infrared (NIR) optical spectroscopy and advanced chemometric techniques, Verax ISX and IMX provide direct process readings in a matter of seconds, in either liquid and gas streams. No moving parts, no consumables, and no sample conditioning systems means longer life and reduced maintenance costs. Our patented laser source utilizes constant amplitude correction and wavelength calibration to deliver performance that is unmatched in the industry. The swept source Class 1 laser provides light intensity strong enough to easily measure even the lowest API gravity crudes.

Enhanced Uptime with Remote Monitoring

Verax’s advanced electronics and communication capabilities allow easy integration into plant networks and systems. Verax also supports 24 x 365 monitoring, making even the most remote unmanned installations possible and economical.
### Environmental, Electrical, Communications, & Process

**Verax ISX/IMX Analyzers**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>Standard: 30”W x 36”H x 12”D</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>83 lbs / 38 kg</td>
</tr>
<tr>
<td><strong>Ambient</strong></td>
<td>• -20°C to 55°C</td>
</tr>
<tr>
<td></td>
<td>• Sunshade required if installed in direct sunlight</td>
</tr>
<tr>
<td></td>
<td>• Environmental control required outside the supported range</td>
</tr>
<tr>
<td><strong>Classification</strong></td>
<td>• ATEX: II 3 G Ex ec nC IIC T3 Gc</td>
</tr>
<tr>
<td></td>
<td>• IECEx: Ex ec nC IIC T3 Gc</td>
</tr>
<tr>
<td></td>
<td>• EN IEC 60079-0: Equipment General requirements</td>
</tr>
<tr>
<td></td>
<td>• EN IEC 60079-7: Equipment protection by increased safety &quot;e&quot;</td>
</tr>
<tr>
<td></td>
<td>• EN IEC 60079-15: Equipment protection by type of protection &quot;n&quot;</td>
</tr>
<tr>
<td><strong>Input Power</strong></td>
<td>• Standard: 100-240VAC / 1.4-0.65 A</td>
</tr>
<tr>
<td></td>
<td>• Alternative: 24VDC/5A</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>NEMA 4X IP 66</td>
</tr>
<tr>
<td><strong>Ethernet</strong></td>
<td>• MODBUS RTU over TCP</td>
</tr>
<tr>
<td></td>
<td>• Hardware firewall</td>
</tr>
<tr>
<td></td>
<td>• Optional: HTTPS interface for local visualization</td>
</tr>
<tr>
<td></td>
<td>• Optional: Air-gapped from control unit</td>
</tr>
<tr>
<td></td>
<td>• Optional: Fiber Balun for long-haul networking</td>
</tr>
<tr>
<td><strong>Serial</strong></td>
<td>• MODBUS RTU over Serial</td>
</tr>
<tr>
<td></td>
<td>• Optional: Air-gapped from control unit</td>
</tr>
<tr>
<td><strong>I/O</strong></td>
<td>• Optional: Maximum 8 analog outputs 4-20mA / 0-10VDC</td>
</tr>
<tr>
<td></td>
<td>• Optional: Maximum 12 digital outputs (dry contact)</td>
</tr>
<tr>
<td></td>
<td>• Optional: Maximum 4 analog inputs 4-20mA / 0-10VDC</td>
</tr>
<tr>
<td></td>
<td>• Optional: Maximum 8 digital inputs</td>
</tr>
<tr>
<td><strong>HMI</strong></td>
<td>12-inch touchscreen color display</td>
</tr>
<tr>
<td><strong>Response Time</strong></td>
<td>• &lt;15 sec for 1-10 Concurrent Measurements per stream</td>
</tr>
<tr>
<td></td>
<td>• &lt;80 sec for 10+ Concurrent Measurements per stream</td>
</tr>
<tr>
<td><strong>Number of Supported Optical Flow Cells</strong></td>
<td>• Verax ISX: 1 Flow Cell</td>
</tr>
<tr>
<td></td>
<td>• Verax IMX: Up to 4 Flow Cells</td>
</tr>
</tbody>
</table>

**VerasIGHT Flow Cell**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>• Standard: 16”W x 17”H x 5.25”D</td>
</tr>
<tr>
<td></td>
<td>• Low pressure gas applications: 55”W x 17”H x 5.25”</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>12 lbs / 5.5 kg</td>
</tr>
<tr>
<td><strong>Ambient</strong></td>
<td>• Operation: -29°C to 70°C</td>
</tr>
<tr>
<td></td>
<td>• Installation: 0°C to 60°C</td>
</tr>
<tr>
<td><strong>Classification</strong></td>
<td>• Conforms to Zone 1 location requirements</td>
</tr>
<tr>
<td></td>
<td>• Class 1 laser output from analyzer control unit</td>
</tr>
<tr>
<td><strong>Input Power</strong></td>
<td>• Standard: None</td>
</tr>
<tr>
<td></td>
<td>• Optional: 110-277 VAC heater blanket (80W)</td>
</tr>
<tr>
<td><strong>Fiber</strong></td>
<td>• Transmit: Single-mode from control unit to flow cell</td>
</tr>
<tr>
<td></td>
<td>• Receive: Multi-mode from flow cell to control unit</td>
</tr>
<tr>
<td><strong>Fluid Streams</strong></td>
<td>Natural Gas, NGL, Crude, Condensate, Refined Products</td>
</tr>
<tr>
<td><strong>Phase</strong></td>
<td>Single Phase: Liquid or Gas</td>
</tr>
<tr>
<td><strong>Line Pressure</strong></td>
<td>0-1750 psig</td>
</tr>
<tr>
<td><strong>Line Temperature</strong></td>
<td>-29°C to 93°C (heater blanket required under -23°C)</td>
</tr>
<tr>
<td><strong>Line Flow Rate</strong></td>
<td>ΔP 1 PSI minimum between process inlet and return to induce flow</td>
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</table>
Each analytical standard in the tables below contains individual precision (repeatability and reproducibility) specifications. The combination of application and analytical method used determines the final performance of the resulting models.

<table>
<thead>
<tr>
<th>Market</th>
<th>Product</th>
<th>Measurement</th>
<th>Standards</th>
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<tbody>
<tr>
<td>Upstream</td>
<td>Crude</td>
<td>C1-C30+ Composition</td>
<td>GPA 2103, GPA 2186</td>
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<tr>
<td>Upstream</td>
<td>Crude</td>
<td>Vapor Pressure</td>
<td>ASTM D6377</td>
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<tr>
<td>Upstream</td>
<td>Crude</td>
<td>API Gravity</td>
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<tr>
<td>Upstream</td>
<td>Crude</td>
<td>True Boiling Point</td>
<td>ASTM D2892, ASTM D5236</td>
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<tr>
<td>Upstream</td>
<td>Crude</td>
<td>Simulated Distillation</td>
<td>ASTM D7169</td>
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<tr>
<td>Upstream</td>
<td>Condensate</td>
<td>C1-C15+ Composition</td>
<td>GPA 2103, GPA 2186</td>
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<tr>
<td>Upstream</td>
<td>Condensate</td>
<td>Vapor Pressure</td>
<td>ASTM D6377</td>
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<tr>
<td>Upstream</td>
<td>Natural Gas</td>
<td>C1-C15+</td>
<td>GPA 2286</td>
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<tr>
<td>Upstream</td>
<td>Natural Gas</td>
<td>Relative Density</td>
<td>GPA 2286</td>
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<tr>
<td>Upstream</td>
<td>Natural Gas</td>
<td>BTU</td>
<td>GPA 2286</td>
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<tr>
<td>Upstream</td>
<td>VRU Gas</td>
<td>C1-C15+</td>
<td>GPA 2286</td>
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<td>Relative Density</td>
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<td>BTU</td>
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<td>C1-C6+</td>
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<td>Downstream</td>
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<td>NGL Products</td>
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<td>ASTM 2163</td>
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<td>NGL Products</td>
<td>Specific Gravity</td>
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<tr>
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<td>NGL Products</td>
<td>Vapor Pressure</td>
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<td>Gasoline</td>
<td>Benzene</td>
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<td>Density</td>
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<td>RON</td>
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<td>Vapor Pressure</td>
<td>ASTM D5191, D6378</td>
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<td>Gasoline</td>
<td>Butane</td>
<td>ASTM D2186</td>
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<td>Cloud Point</td>
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*Note: This is not an exhaustive list of possible measurements and standards; many others are available.