

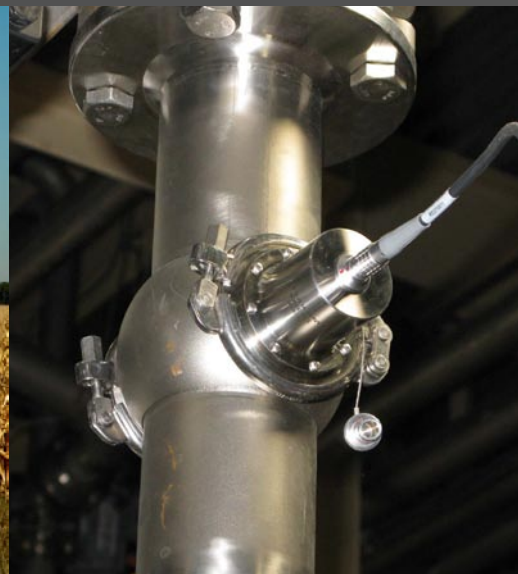
# VS-3000 BioETHANOL PROCESS MONITOR

## Infrared Analytical Sensor

Real-time concentration readings inline 24x7  
Brix, Alcohol, CO<sub>2</sub> and Temperature



*The VS-3000 BioEthanol Process Monitor measures dissolved concentrations real-time, 24x7. Infrared technology overcomes the constraints of density-based methods to accurately report conditions in a zero discharge process. VitalSensors products are easy to install, easy to integrate and have a low cost of ownership.*



**VitalSensors Technologies LLC** is the leader in innovative, inline instruments for process control. The VS-3000 BioEthanol Process Monitor measures up to three parameters and temperature simultaneously using one sensor head.

Real-time, inline concentration readings available for dissolved:

- Alcohol / Ethanol
- Brix / Sugars
- CO<sub>2</sub>

**Precision Infrared Measurements of Process Contents** — VS-3000 Sensors provide instantaneous readings for fluids and viscous solutions in process streams or tanks. VS-3000 Sensors can be implemented in flow or no flow conditions and are not affected by pressure spikes, color, viscosity or extreme working conditions. Infrared measurement does not rely on solids or density to determine process contents. Ingredients are measured at the molecular level – this is particularly advantageous in a zero discharge process where un-fermentable solids exist.

**Maintenance and Cost Savings** — VS-3000 sensors are state of the art, solid-state devices which contain no moving parts and require no maintenance. MTF > 50,000 hrs.

**Improved Plant and Asset Utilization** — The proven reliability, accuracy and repeatability of the VS-3000 Sensors allow plant personnel to better allocate resources and minimize downtime. Direct IR measurement of fermentation process and the cook cycle can help increase plant capacity.



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# Product Specifications

System includes inline sensor, cable, Sensor Management Station with local display and Windows™-based software

Part #'s Parameter Measured	VS-3000BM (Alcohol / Brix / CO <sub>2</sub> ) and VS-3000BMAE (Alcohol / Brix) Ethanol/Alcohol	Brix / Sugars	CO <sub>2</sub>
Measuring Range	0 – 20 w/w % standard 0 – 100 w/w % customizable 0 – 20 v/v%	0 - 30° Brix standard 0 - 80° Brix customizable	0 to 6 v/v 0 to 12,000 ppm 0 to 12,000 mg/L 0 to 12 g/L
Accuracy	± .016 w/w % ± .02 v/v %	± .01° Brix	± .02 v/v ± 39.2 ppm ± 39.2 mg/L or .0392 g/L
Resolution	.01 w/w % .01 v/v %	.01° Brix	.01 v/v 1 ppm 1 mg/l or .001 g/L
Repeatability (8 hour test)	.01 w/w % .01 v/v %	.008° Brix	.008 v/v 16 ppm 16 mg/l or .016 g/L

Measuring Method	Mid Infrared spectrometer with Attenuated Total Reflectance (ATR) sampling
Measuring Interval	100 ms
Data Output Interval	100 ms to 30s (user defined)
Operating Process Temperatures (in 40°C spans)	-2°C to 85°C Standard Model -2°C to 120°C Extended Temperature Model (with cooling jacket)
Temperature Display Range	-5°C to +85°C (+23°F to 185°F)
Maximum CIP Temperature	85°C (standard model) 120°C (extended temperature model – with cooling jacket)
Maximum Line Pressure	10 bar (150 psi)
Process Connection	68mm Tuchenhagen Varinline® connection fitting (DN65)
Dimensions (Sensor)	82.6mm (3.25 in) W x 82.6mm (3.25 in) H x 82.6mm (3.25 in) D
Enclosure	IP68 (NEMA4)
Shock Resistance	100G 1/2 sine wave or 6 foot drop on concrete

## Operator Interface – VS-300 Sensor Management Station or VS-200 Sensor Management Station (DIN Rain Mounted)

Display	Concentration(s), Temperature and Time on four-line VFD display
Cable (Distance to Sensor)	4.6m (15 ft.)
I/O	Digital I/O board for Remote IN/Relay OUT up to 64 brands - - (VS-300 only)
Fieldbus Interfaces	4-20mA, Ethernet, EtherNet/IP and DIO (standard) Profibus DP (optional)
Power	120/240 VAC, 50-60 Hz (auto sensing) or 24VDC
Dimensions (WxHxD VS-300 SMS)	222.3mm (8.75in) W x 290.8mm (11.5 in) H x 139.7mm (5.5 in) D
Enclosure (VS-300 only)	IP67 (NEMA4)
Ambient Temperature	-5°C to +40°C (+23°F to 104°F)
Shipping Weight (Total System)	9.07 kg (20 lbs)
Approvals	CE, FCC, VCCI Class A, AS/NZS Class A