

VS-1000A Series Inline Ethanol/Alcohol Sensors for Beverage and Biofuel Plants



*Economical Inline Smart Infrared Sensors for Real-Time Process Monitoring:
Continuous Accurate Ethanol/Alcohol Measurement in Beverage and Biofuel plants*



VitalSensors Technologies LLC is an applications specific spectroscopy company that designs, manufactures and markets leadership **Inline Networked Smart Infrared Sensors** for real-time process control. VitalSensors' products are designed for use by the Beverage, Food, Biofuel and other Process Industries worldwide.

VitalSensors' VS Series of sensors are the next generation of process sensors. They combine smart spectrometer technology with state of the art networking and software in a compact form factor that fits in the palm of the user's hand. The VS Series sensors have been designed to be implemented inline in a process stream for **direct real-time measurement** and thus can be used to make analyses in situ.

Real-time control concentration **measurements of ethanol/alcohol in beer, spirits and other beverages are common applications.** Ethanol measurement in Biofuel plants is also possible.

VS Series sensors are solid state and provide reliable and instantaneous data when integrated into a company's process and quality control network applications. The breakthrough economics and functionality of the VS Series address the limitations of older technology instruments that measure concentration through indirect methods and are expensive to deploy.

ETHANOL/ALCOHOL APPLICATIONS:

- Brewery and Distillery alcoholic beverage production QA/QC
- Ethanol biofuel production QA/QC
- Methanol concentration measurement
- Isopropanol concentration measurement
- Alcohol/Water/Alcohol Interface Detection
- Ethanol in pharmaceuticals production

DIRECT INFRARED MEASUREMENT 24x7

The VS-1000A Series Ethanol/Alcohol Inline Sensors directly measure in real-time the ethanol content of beverages and biofuels in pipes, tanks, or fillers post fermentation. The Sensors can be implemented in flow or no flow environments and are not affected by pressure spikes or extreme working conditions. The Sensor also measures process temperature very accurately.

LOW COST INSTRUMENT, WITH SERVICE and MAINTENANCE SAVINGS - NEW LEVELS OF RELIABILITY

The VS-1000A Series Inline Sensors are maintenance free 24x7 solid state devices saving users thousands of dollars in maintenance costs as well as supporting plant production optimization.

INSTALLATION SAVINGS

The Sensors are physically installed in under thirty minutes and are shipped with a factory standard calibration. No special installation requirements are required except for the proper pipe or tank fittings. Total weight of the system is 9 kg or 20lbs.

NETWORKING FLEXIBILITY

A Sensor Management Station contained in a small NEMA 4 enclosure is available. When connected to the VS-1000A Sensors it provides broad communications flexibility for plant floor networks.

FEATURES of VS-1000A SENSOR:

- Network capable; two way communication with check sum
- Clean and sterilize in place
- Varivent fittings - (4 inch + Tri-Clamp adapters available upon request)
- Maintenance free device
- Class I, Class II Hazardous Location (option)
- Shock resistance: 100G ½ sine wave or 6 foot drop on concrete floor
- Solid state – no moving parts



VS-1000A
inline
installation in
Beverage Plant

24x7
Operation
Maintenance
Free

INFRARED SENSOR TECHNOLOGY

The VS-1000A Series Sensor is a compact solid state “smart” spectrometer comprised of infrared detectors with optical filters that use reference wavelengths and an active wavelength to monitor the molecular absorption of ethanol/alcohol every 100 ms.

The VS-1000A Series Sensor uses an ATR (attenuated total reflection) crystal. Using an ATR crystal permits a cumulative increase in absorption resulting in an improvement in signal to noise ratio, which is additive by number of reflections and improves accuracy and resolution. ATR is an ideal sampling technique for inline monitoring because there is no path through air and very rugged optical elements including diamond and sapphire can be used for the sample interface.

VS-300 SENSOR MONITOR SHOWING ETHANOL AND TEMPERATURE



VS-1000A Series Sensors are complemented by the VS-300 Sensor Management Console software. The Console allows for the on-line management and instantaneous data representation of the sensor output. It has a digital display of temperature and concentration in volumes %, parts per million, or milligrams per liter.

The VS-300 can act as part of fieldbus network providing continuous data to plant PLCs or, send data to the Sensor Monitor Client PC application. Data log files are optional allowing the user to view data in other programs such as Excel and MathCad. The VS-300 software automatically uses the temperature correction coefficient as well as the sensor calibration coefficients stored in the sensor EEprom.

The VS-300 Software has both offset and gain correction available so that the sensor can provide data relative to a customer's historical methods and process analysis database.



VS-300 Sensor Management Station

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SPECIFICATIONS ETHANOL/ALCOHOL

Measurement Type	Direct infrared
Measuring Range <ul style="list-style-type: none"> Ethanol//Alcohol PPM mg/l or g/l 	0 – 100 w/w 0 - 1,000,000 customizable
Accuracy <ul style="list-style-type: none"> Ethanol//Alcohol 	± .02 w/w (0 – 100 range w/w)
Resolution <ul style="list-style-type: none"> Ethanol//Alcohol 	.01 w/w
Repeatability Test <ul style="list-style-type: none"> Ethanol//Alcohol 	.01 – 8 hour test w/w
Operating Temperature Extended Temperature <ul style="list-style-type: none"> Resolution 	-2 to +85°C 28.4°F to 185F to 120°C - 248°F .01° C or F
Storage Temperature	-40° to 70°C, -40° to 156°F
Line Pressure	max. 10 bar 150 psi
Measuring Interval Data Output Interval	100 ms 500 ms to 30 secs. (user defined)
Operation <ul style="list-style-type: none"> CIP SIP Routine Maint. 	Continuous 24x7 Yes – Max temp. 85°C Extended Option to 120°C 248°F None
Inputs/Outputs <ul style="list-style-type: none"> Ethernet 4-20mA EtherNet/IP Modbus Profibus PA 	Standard Option Option Please call Option
Dimensions (WxHxD) Sensor Sensor Mgt. Station	82.6x82.6x82.6mm 222.25x290.83x37.922mm
Weight	9.09 kg (20 lbs) total system
Shock Resistance	100G ½ sine wave or 6 foot drop on concrete
Degree of Protection	IP65 NEMA4X Hazardous location (optional)
Process Connection Process Pipes Tanks Fillers	VARIVENT™ (DN65) Adapters available for various size pipe and tank fittings
Flow Rate	Not required
Materials in contact with the concentration	316 stainless steel, Sapphire crystal, virgin PEEK seals
Power Supply <ul style="list-style-type: none"> VS-1000 Sensor VS SMS 	5VDC @ 2 amps Autosensing 120V AC @ 1 amp
Part Numbers:	
VS-1000A	Inline Ethanol/Alcohol Sensor System One year warranty