

## VS-1000C Series In-line CO2 Sensors for the Beverage Industry



*In-line Networked Smart Infrared Sensors for Real-Time Process Monitoring:  
Continuous Accurate Data Anywhere On The Network*



VitalSensors Technologies LLC is an applications specific spectroscopy company that designs, manufactures and markets leadership **In-Line Networked Smart Infrared Sensors** for real-time process control. VitalSensors' products are designed for use by the Beverage and Food 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 in-line in a process stream for **direct real-time measurement** and thus can be used to make analyses in situ. Real-time **measurements of carbonation levels, brix, carbohydrates, water in solvents, fats, and proteins are among the many applications for the VS Series of sensors.**

VitalSensors is the first company to truly take process analytical spectroscopy instruments out of the laboratory and onto the plant floor economically. 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 will permit manufacturers to replace older technology that measure processes through indirect methods with a more accurate, reliable, true direct measurement instrument that operates 24x7 at lower acquisition and operating costs

### **BEVERAGE APPLICATIONS:**

- Measuring dissolved CO2 in Beer
- Measuring CO2 content of soda

- Measuring CO2 content of wine coolers
- Measuring dissolved CO2 in fluids

## DIRECT INFRARED MEASUREMENT 24x7

VS-1000C Series CO2 In-Line Sensors directly measure in real-time the true contents of fluids in a process stream, tanks, or fillers. 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 temperature very accurately while simultaneously measuring concentration in fluids.

## SERVICE and MAINTENANCE SAVINGS - NEW LEVELS OF RELIABILITY

The VS-1000C Series CO2 In-Line Sensors are maintenance free 24x7 solid state devices saving users thousands of dollars in maintenance costs and vendor replacement parts.

## 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.

## NETWORKING FLEXIBILITY

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

## FEATURES of VS-1000 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
- Weighs less than three pounds
- Shock resistance: 100G ½ sine wave or 6 foot drop on concrete floor
- Solid state - no moving parts



VS-1000C  
in-line  
installation at  
Brewery

24x7  
Operation  
Maintenance  
Free

The VS-1000C Series CO2 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 the substance being measured.

The VS-1000C Series CO2 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 in-line 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 MANAGEMENT CONSOLE SOFTWARE



The VS-1000C Series CO2 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 100 milliliters. The data is graphed over time and has both control and specification limits.

The Console can act as a standalone application or feed data transparently to plant floor PLCs. 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

**VitalSensors Technologies LLC**

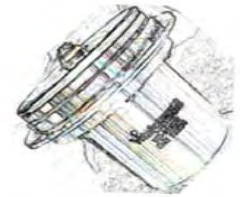
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**SPECIFICATIONS FOR CO2**

Measurement Type	Direct infrared
Measuring Range <ul style="list-style-type: none"> <li>• vol</li> <li>• ppm</li> <li>• Mg/l</li> </ul>	0 to 5 vol (customizable) 0 - 50,000 0 - 50,000
Accuracy <ul style="list-style-type: none"> <li>• vol</li> <li>• ppm</li> <li>• mg/100ml</li> </ul>	.02 39.2 3.92
Resolution <ul style="list-style-type: none"> <li>• vol</li> <li>• ppm</li> <li>• mg/100ml</li> </ul>	.01 1 1
Repeatability Test <ul style="list-style-type: none"> <li>• vol</li> <li>• ppm</li> <li>• mg/100ml</li> </ul>	.008 - 8 hour test 40 - 8 hour test 1.57 - 8 hour test
Measuring Temperature <ul style="list-style-type: none"> <li>• Resolution</li> </ul>	-5 to +85°C 23 to 185F customizable .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"> <li>• CIP</li> <li>• SIP</li> <li>• Routine Maint.</li> </ul>	Continuous 24x7 Yes - Max temp. 85°C Yes None
Inputs/Outputs <ul style="list-style-type: none"> <li>• Ethernet</li> <li>• 4-20mA</li> <li>• EtherNet/IP</li> <li>• Modbus</li> <li>• Profibus PA</li> </ul>	Standard Standard with converter Option Please call Option
Dimensions (WxHxD) Sensor Sensor Mgt. Station	82.6x82.6x82.6mm 222.25x290.83x37.922mm
Shock Resistance	100G ½ sine wave or 6 foot drop on concrete
Degree of Protection	IP65 NEMA4
Process Connection Process Pipes Tanks Fillers	VARIVENT™ (DN65) Adapters available for various size pipe and tank fittings
Flow Rate	Not required
Power Supply <ul style="list-style-type: none"> <li>• VS-1000 Sensor</li> <li>• VS SMS</li> </ul>	5VDC @ 2 amps Autosensing 120V AC @ 1 amp

**Part Numbers:**

<b>VS-1000C</b>	In-line CO2 Sensor System One year warranty
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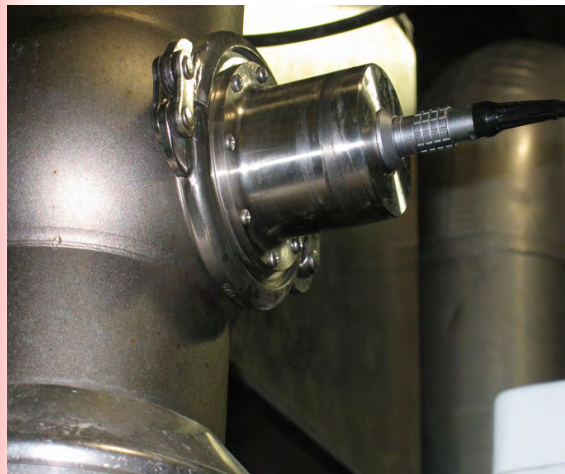
Varivent Assembly and Sensor



Sensor crystal in pipe



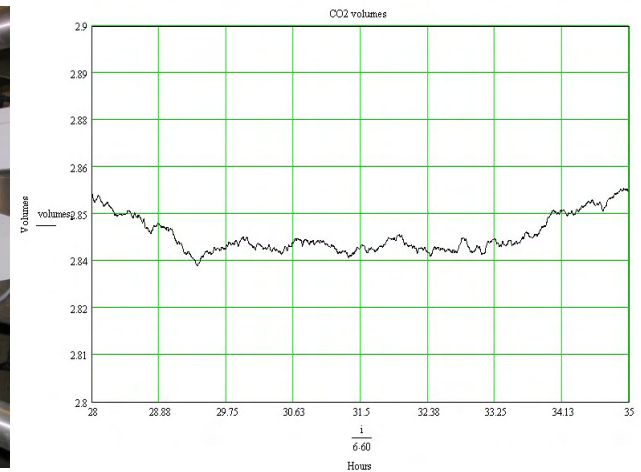
Sensor installed in pipe



Sensor in production



Sensor Management Station



24x7 data stream  
March 6, 2006