

PRODUCT DATASHEET

# Hydrogen Peroxide Vapor (HPV) Analyzer System

Measuring  $H_2O_2$  and  $H_2O$  Under Ambient  
or Vacuum Conditions



**Real-time**

**Direct**

**Measurement**

- Real-time HPV sterilant gas monitoring
- Proven technology works in vacuum and atmospheric
- $H_2O_2$  and  $H_2O$  concentration by direct optical NIR
- Vital for resistometers and HPV cycle development
- Independent reference for HPV load production
- Optical RH and relative saturations measurements

GUIDED WAVE'S HPV Analyzer is a simple turnkey solution for the measurement of hydrogen peroxide and water (H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O) concentrations in vapor phase. These are both measured together because they are codependent. The analyzer operates in real time, which takes the guesswork out of determining the H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O concentrations during cycle development and throughout the actual sterilization cycle. The user gains continuous, accurate data for documentation and validation.

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## Low Pressure Monitoring – Accurate, Reliable Results

Unlike chemical sensors, the HPV Analyzer is able to measure H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O concentrations in vapor phase under ambient or vacuum conditions. Many processes use low pressure in the sterilization process to ensure penetration of product packaging. The HPV Analyzer allows you to monitor these cycles so you can determine that the correct concentration of H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O were present during each cycle.

- Rapid response
  - Multiple sample points on one analyzer
  - Not subject to sensor poisons or analyte degradation
  - Built-in validation available
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## Proven Technology

The HPV Analyzer System utilizes a Guided Wave multi-wavelength ClearView db filter photometer analyzer platform. Guided Wave has been measuring H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O concentrations in various vapor mixtures for over 20 years using near-infrared (NIR), fiber optic-coupled analyzers. Optimal wavelengths for H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O were selected to produce a simple yet rugged and reliable analyzer for this dedicated application. This design uses fixed wavelength filter technology, yet still incorporates dual beam design for stability and accuracy. Fiber optic cables take the NIR light energy to the probe in the isolator and returns the non-absorbed light energy back to the analyzer – the optical equivalent of vapor sampling. The HPV analyzer measures as low as 0.1 mg/L of H<sub>2</sub>O<sub>2</sub> and 1.0 mg/L of H<sub>2</sub>O. With the addition of a temperature value, relative humidity and relative saturation measurements can be made.

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## Easy Operation and Control

The HPV analyzer is controlled via its touch screen or remotely via Ethernet (Modbus TCP/IP). All of the analytical calculations are encoded in the software.

## Quick Installation and Start-up

The complete system consists of an HPV Analyzer, one or two G-SST Vapor Probes, and a pair of fiber optic cables for each probe. The G-SST Vapor Probe mounts in the sterilizer chamber side wall, vapor transfer/recycle lines or optionally on the chamber inner roof with a fiber feed through sanitary cap. The HPV Analyzer is pre-calibrated at the factory.

No programming is required by the user. Start-up requires powering the HPV Analyzer, connecting the probe or probes via the fiber optic cables, taking a ZERO reading in the dehumidified isolator and the H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O concentration measurements may begin.

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## Performance Validation

When performance validation is required the G-SST Vapor Probe has a built-in validation filter (optional) made of polymeric material. This makes validation of performance easy, at any time. The filter has unique spectral characteristics at the wavelengths used to measure H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O. It was chosen because of its insensitivity to moisture and temperature conditions. To make a validation measurement, the validation filter is manually positioned into the light path and the optical characteristics of the system are checked.

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## HPV Analyzer Optional Enclosures

Typically for medical, pharmaceutical and food industries, the HPV analyzer may be housed in a stainless steel enclosure. Other enclosure options are available, such as, painted carbon steel, explosion-proof or purged depending on area classification requirements.

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## User Programmable Features

- Password protection for configuration changes
  - Sampling time: 1 second minimum. User settable
  - Reporting units: mg/L or ppm-V
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## HPV Analyzer System Accessories and Options

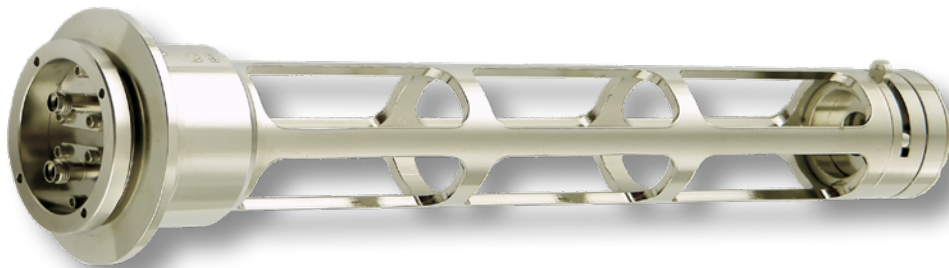
- 2nd channel for additional independent sampling point
- Custom length fiber cables
- KF or Tri-clover® flanged fiber feed throughs and dual fiber feed throughs
- Annual factory calibration service available
- Universal power supply (110-240 VAC converter to 24 VDC)
- Custom calibration for elevated temperature on request

## Fiber Cable

- 500 µm Ultra Low-OH fiber with Stainless Steel SMA-905 connectors
  - Kevlar® protected or armored cables available
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## G-SST Vapor Probe for HPV Analyzer System

- Operating temperature range: 5 °C to 90 °C
- 50 cm path length – double pass 25 cm
- Suitable for vacuum (down to  $1 \times 10^{-5}$  Torr) and positive pressure (up to 1520 Torr, 2 atm)
- SMA 905 fiber optic interface
- Built-in validation filter (optional)
- Probe may be mounted fully inside the isolator or through isolator wall using a 2 inch sanitary flange



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## The Smart Choice for Reliable HPV Measurement

Guided Wave's HPV Analyzer System delivers accurate, real-time H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O measurement results. Its long term stability and no maintenance requirements make it a cost effective, smart choice to help optimize production and ensure product quality ultimately enhancing profitability.

An ISO 9001 certified company, Guided Wave maintains expert technical support and responsive global service for the lifetime of the system.



Control panel with indicator lights and switches.

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<b>Specifications:</b>	
<b>H<sub>2</sub>O<sub>2</sub> Vapor Measurement Range:</b>	0.1 - 50.0 mg/L [71.2 - 35,600 ppm V/V]
<b>H<sub>2</sub>O<sub>2</sub> Measurement Accuracy:</b>	± 0.1 mg/L
<b>H<sub>2</sub>O Vapor Measurement:</b>	1.0 mg/L - to condensation [>1345 ppm V/V]
<b>H<sub>2</sub>O Measurement Accuracy*:</b>	1.0 mg/L
<b>Enclosure Options</b>	
<b>Stainless Steel:</b>	16 in x 12 in x 6 in (41 cm x 30 cm x 15 cm)
<b>Painted Carbon Steel:</b>	14 in x 12 in x 6 in (36 cm x 30 cm x 15 cm)
<b>Sample Points (channel):</b>	1 or 2
<b>Response Time:</b>	1 second, minimum. User settable

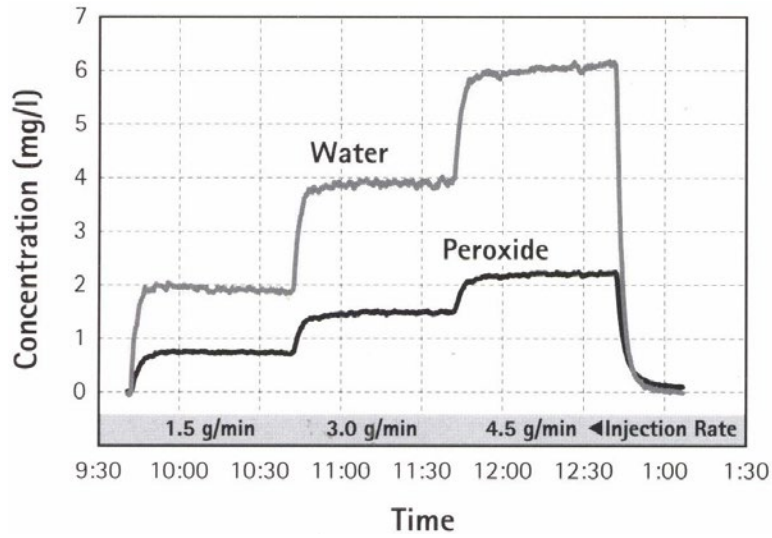
\*Relative to concentration at time of reference

# Operating Environment

Ambient Temperature: 10 °C – 45 °C

Optimal Ambient Temperature Stability: <math>< \pm 2 \text{ }^\circ\text{C}</math>

Relative Humidity: 0 – 90% non-condensing



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Our commitment is to deliver smart and affordable innovation that optimizes process, improves safety, and transforms our world.

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