

Hydrogen Peroxide Vapor (HPV) Analyzer System

Measuring H₂O₂ and H₂O Under Ambient or Vacuum Conditions

GUIDED WAVE'S HPV analyzer is a simple turnkey solution for the measurement of hydrogen peroxide and water (H₂O₂ and H₂O) 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 H₂O₂ and H₂O concentrations during cycle development and throughout the actual sterilization cycle. The user gains continuous, accurate data for documentation and validation.

Low Pressure Monitoring - Accurate, Reliable Results

Unlike chemical sensors, the HPV analyzer is able to measure H₂O₂ and H₂O 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 H₂O₂ and H₂O 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

Proven Technology

Guided Wave has been measuring H₂O₂ and H₂O concentrations in various vapor mixtures for over 20 years using near-infrared (NIR), fiber optic-coupled analyzers. Optimal wavelengths for H₂O₂ and H₂O were selected to produce a simple yet rugged and reliable analyzer for this dedicated application. This new 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 H₂O₂ and 1.0 mg/L of H₂O.

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.



HPV Analyzer in Stainless Steel Cabinet

Quick Installation and Start-up

The complete system consists of HPV analyzer one or two G-SST probes, and a pair of fiber optic cables for each probe. 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 H₂O₂ and H₂O concentration measurements may begin.

Performance Validation

When performance validation is required the G-SST probe has a built-in validation filter (optional, but recommended) 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 H₂O₂ and H₂O. It was chosen because of its insensitivity to moisture and temperature conditions. To make a validation measurement, the validation filter is temporarily moved into the light path and the optical characteristics of the system are checked.

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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G-SST Vapor Process Probe works in Vacuum-to-Positive Pressure

HPV Analyzer Specifications

H ₂ O ₂ vapor measurement range	0.1 - 50.0 mg/L [71.2 - 35,600 ppm V/V]
H ₂ O ₂ measurement accuracy	± 0.1 mg/L
H ₂ O vapor measurement range	1.0 mg/L – to condensation [>1345 ppm V/V]
H ₂ O measurement accuracy*	1.0 mg/L
Enclosure Options: Stainless Steel	16 in x 12 in x 6 in (41 cm x 30 cm x 15 cm)
Painted Carbon Steel	14 in x 12 in x 6 in (36 cm x 30 cm x 15 cm)
Sample Points (channel)	1 or 2
Response Time	10 to 60 seconds

*Relative to concentration at time of reference

G-SST Vapor Probe for HPV Analyzer System

- Operating Temperature Range: 5°C to 120°C
- 50 cm path length - double pass 25 cm
- Suitable for vacuum (down to 1 x 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
- For more information see Guided Wave literature #1055

Operating Environment

Ambient temperature	10 – 45 °C
Optimal ambient temperature stability	< ±2 °C
Relative humidity	0 – 90% non-condensing

User Programmable Features

- Password protection for configuration changes
- Sampling time: 10 - 60 seconds
- Reporting units: mg/L or ppm-V

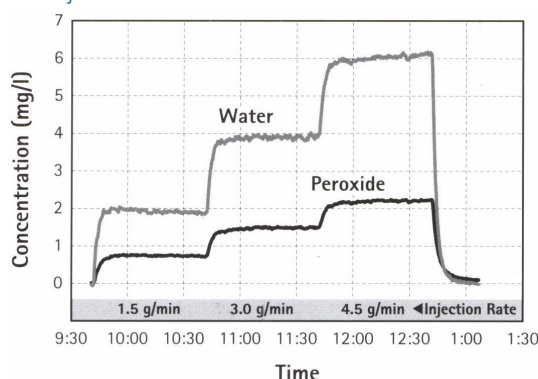
HPV Analyzer System Accessories and Options

- 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

Fiber Cable

- 500 µm Ultra Low-OH fiber with Stainless Steel SMA-905 connectors
- Kevlar® protected or armored cables available

Typical Water and Hydrogen Peroxide Vapor Concentrations for Various Injection Rates



Hydrogen Peroxide and Water Concentrations in an Isolator

The Smart Choice for Reliable HPV Measurement

Guided Wave's HPV analyzer system delivers accurate, real-time H₂O₂ and H₂O 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.



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