

Hudson™ Bioreactor Raman Immersion Probe

High-performance process monitoring of bioprocess samples via Raman spectroscopy

Tornado's Hudson™ Bioreactor Raman Immersion Probe capitalizes on the power of Raman in bioprocess manufacturing by measuring multiple, specific components in real-time for continuous, around-the-clock process feedback. Its optical design is optimized for compatibility with Tornado's Process Guardian™ and HyperFlux™ PRO Plus Raman analyzers and can be used for the superior representative sampling and measurement reproducibility for liquids, solids, slurries, powders, and heterogeneous mixtures. The Hudson™ Bioreactor Raman Immersion Probe can collect high-quality data on either flowing or stationary samples and allows users to optimize accuracy, quality, and yield over a wide range of biological processes.



Disassembled for sterilization



★ KEY FEATURES

- Compact stainless steel Raman probe with fully integrated optics, eliminating the risk of misalignment or internal contamination
- Optimized for compatibility with Tornado's Raman analyzers with HTVS™ technology for 10x to 30x higher Raman signal than conventional Raman systems, delivering better precision and sensitivity
- High purity optical elements ensure low background
- No epoxy or gold seals, providing zero leaching risk

KEY APPLICATIONS:

- Cell Line Development
- Cell Fermentation (Mammalian or Bacterial)
- Manufacturing Scale-Up
- Cell Culture: Quantification of glucose, lactate, cell density, protein titer, amino acids, acetate, and ammonium

PERFORMANCE

The unrivaled optical efficiency of Tornado's analyzer and probe solutions enables bioprocess Raman measurements with maximum dynamic range using typical exposure times of only 0.1 to 1 second, and with spectral averaging enabled, users can get high-precision metabolite predictions every 1 minute to 5 minutes.



- Compatible with bioprocess industry standard ports
- PG13.5 threaded connector
- Autoclavable
- Compatible with single use mixers/reactors

For non bio immersion probes, please contact Tornado for other OD and housing material options

Tornado's Hudson™ Bioreactor Raman Immersion Probe with Process Guardian™ Raman Analyzer

Device Specifications:

SIZE	13.4 x 1.8 x 1.1 in (34 x 4.5 x 2.8 mm)
WEIGHT	1.6 lbs (735 g) (complete assembly: Hudson™ Probe, Inner Lens Tube Assembly & ViewPort)
EXCITATION WAVELENGTH	785 nm
IMMERSION TUBE DIMENSIONS	12 mm diameter, 215 mm wetted length
FITTINGS	Industry standard PG13.5
WORKING DISTANCE (FOCAL OFFSET)	Factory-configured for either 0 mm (for turbid samples) or 2 mm (for transparent samples)
SURFACE FINISH	Ra 0.8 µm (32 µinch)
AUTOCLAVE CYCLES	Up to 1000

