EquiSPEC HP™

Next Generation In-Line Process Spectrophotometer

INTRODUCTION

The Equi**SPEC HP**™ is an advanced in-line spectrophotometer system engineered for real-time process monitoring and control in demanding production environments. Housed in a robust NEMA12 stainless steel enclosure, the system integrates a high-performance spectrophotometer and a modern touchscreen industrial computer. A built-in thermoelectric cooling and heating module ensures a stable internal temperature for maximum measurement accuracy – even under conditions with dust, vibrations, and fluctuating temperatures or moisture.

The Equi**SPEC HP** utilizes fiber optic probes to deliver light to the process stream and return the measured signal to the analyzer. Probes and hardware are designed for reliable operation in high-temperature, high-pressure, and corrosive process conditions.

CHEMICAL & COLOR MEASUREMENTS

The Equi**SPEC HP**™ enhances production efficiency and product quality by providing continuous, precise chemical and color measurements directly on the process line. Applications include:

- **Reaction end-point detection**
- **Monitoring product purity, color, clarity, and concentrations of liquids, powders, or gases**
- **Ensuring compliance and accountability for sensitive or high-value materials**
- **Optimizing reactions and process consistency**
- **Maintaining strict color matching in pigmented products (plastics, paints, inks, textiles, cosmetics)**
- **Reducing scrap and sampling time to meet color tolerances at high extrusion speeds**

SYSTEM UPGRADES & NEW FEATURES

The new generation Equi**SPEC HP** sets a new standard for in-line process measurement with major hardware and software enhancements:

- **High-Speed Measurements:** Up to **20 readings per second** to capture rapid process changes and detect gels, black specks, and other defects in real time.
- **Multi-Probe Capability:** Supports up to **four probes** for simultaneous monitoring at multiple points.
- **Long-Life LED Light Source**: Replaces xenon flash lamp for greater stability and lower maintenance.
- **Modern Web-Based Interface:** Updated software with intuitive controls, remote access, and easy customization.
- **Smart Features:** Includes **auto-optimization, residence time tracking,** and **historical data analysis** for deeper process insights**.**

OPTICAL

Repeatability RMS delta E (white tile)	Maximum 0.01 RMS delta E CIELAB*
Inter-Instrument Agreement (LASP)	Maximum 0.08 ave. delta E CIELAB*
Short-term repeatability (p-p of 20 consecutive measurements)	
L*a*b* white tile	0.02
L*a*b* selected high chroma BCRA II	0.04
L*a*b* selected neutral or low chroma BCRA II	0.02
Spectral 420 - 680 nm, white tile, % full scale	0.10
Spectral 400 - 420 & 680 - 700 nm, white tile, % full scale	0.15
Illumination	LED array
Detector	Hamamatsu S11639, 2048 horizonal pixels
Spectrometer Type	Symmetrical Czerny-Turner
Instrument Configurations	All fiber-optic, dual spectrometer, multi-beam
Signal / Noise	375:1
Spectral Range	380 - 780 (standard.); ranges customizable
Wavelength Accuracy	< ± 0.25mm
Wavelength Reproducibility	< ± 0.05mm
Wavelength Resolution	0.75nm, nominally w/25 micron slit
Photometric Range	0 - 200% reflectance
Stray Light	0.1% - 1% Typical
Measurement Time	Probe / sample dependent; as low as 0.05s

GENERAL

Interface	12.1 in. touch display
Enclosure	NEMA 12, TE-cooled, IP65
Dimensions	44W x 40H x 23.5D cm (24.5 x 23.0 x 9.5 in.)
Weight	22.7 kg (50 lbs.)
Mounting Holes	4
Horizontal Spacing	40.0 cm (15.75 in.), center-to-center
Vertical Spacing	45.0 (17.7 in.), center-to-center
Diameter	1.0 cm (0.4 in.) Accepts 3/8 in. bolts
Temperature (operating)	15 - 45 °C
Electrical Requirements	100-120 VAC, 2.8 A, 50 - 60 Hz 200 - 240 VAC 1.6 A, 50 - 60 Hz
External Ports	USB (2), RS-232 (1), Ethernet (1)

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