

TELEDYNE ANALYTICAL INSTRUMENTS

End of Column Protein Purity by UV Detection

Teledyne offers a low cost, fiber optic based, UV photometric transmitter and sample interface for monitoring the amount of protein from HPLC semi/preparative columns. The system incorporates state of the art electronics connected to fiber optic based insitu probes or extractive flow cells. The transmitter can be packaged for lab or restricted process area classifications. The transmitter operates continuously with no moving parts and can be integrated into bench top or process environments.

Defining the Problem

Typical protein determination is done with a full spectrum instrument or a fixed filter based photometer. Direct protein absorbance at either 220 or 280nm are the wavelengths most commonly employed for this application. Unlike other UV monitors, this unit can place the flow cell at the exit of any column with the use of fiber optic cables, thus avoiding any peak broadening or fraction overlap.

The Teledyne Solution

Teledyne probes are designed to withstand CIP conditions and extremes in temperature and pressures. In addition to monitoring the optical transmittance or scatter, the probes can be supplied with sanitary flanges that fit the standard 25mm or 19mm Ingold type fittings.

Teledyne offers both in situ probes and extractive flow cells for this measurement. Both the insitu and extractive fiber optic accessory separates the sample from the

electronics via safe, nonconductive fiber optic cables. All components in contact with the sample are 16SS, Sapphire, and FDA approved o-ring materials.

Photometric Transmitter

Teledyne's photonic transmitter displays engineering units (AU, ppm, g/l, %, etc.) and retransmits a 4-20mA signal that is proportional to the amount of optical density in the sample being measured. This reading is based on the amount of optical attenuation from the absorbed sample as compared to a reference signal. The unit is supplied with a window fouling circuit and a calibration span filter which provides the user with important diagnostic information about the transmitter's health. The optional calibration span filter allows the user to (either manually or automatically) employ a referenced optical filter to the measuring beam.



Model 53T UV Protein Transmitter

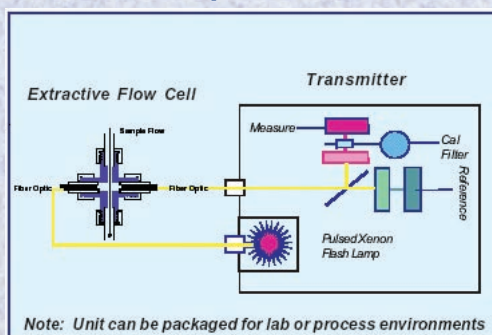


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Calibration by standard addition is a proven technique that allows a reference check of the probe and transmitter without mixing solutions or running samples to a lab. In addition, this technique can be

performed without shutting down the process. All span/ calibration filters are calibrated against a primary reference filter.

Process Optical Schematic



Where the unit can be used

- Fermentation reactor
- Biotech research
- Amino acid / Nucleic acid
- Pharmaceutical plants
- Protein purification
- Industrial biochem labs

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PRODUCT SPECIFICATIONS - 53T Series Photometric Transmitter

Transmitter

Measured parameter:	Protein
Resolution:	Depending on fiber accessory
Temperature range:	-40 to +50° C
Response time:	< 1 sec
Maximum Zero shift:	0.005AU (over +20 to +40° C)
Long term output drift:	<2% signal loss / month
Repeatability:	1% of range
Range:	Pathlength dependent
Source:	Xenon Flashlamp (2 to 3+ year life depending on flash rate)
Wavelength range:	200 - 650 nm
Detectors:	PMT or Silicon

User Display & Control

Type of display:	LED display
Display numerical format:	3-1/2 digits in user defined engineering units

Electrical

Power requirement:	24VDC (9-32 VDC)
Power consumption:	0.48 Watts
Analog outputs:	4-20mA isolated
Analog loop resistance:	500 Ohms, maximum @ 24V
Certification:	CE (Available upon request)

Mechanical

Transmitter weight:	1.5 lb.
Enclosure:	Extruded aluminum (NEMA 4X optional) 8" H x 3-7/8" W x 1.5" D

Probe / Flow Cell

Materials:	316SS, other material available, please consult factory
Max temperature rating:	315.5° C (600° F)
Max pressure rating:	5000 psig
Expected probe life:	25 years

Probe options:

1. 6, 12, or 24" in length
2. Automatic retractor for cleaning
3. Temperature measurement
4. Welded flange for standard 25mm or 19mm Ingold fittings, or Novaseptic

Transmitter options:

1. Industrial Packaging (Nema or Ex-Proof enclosures)
2. NBS Traceable Span Filter
 - a. Manual
 - b. Automatic (remote trigger)
3. 110 / 220 to 24 VDC power supply

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Warranty

Instrument is warranted for 1 year against defects in material or workmanship. NOTE: Specifications and features will vary with application. The above are established and validated during design, but are not to be construed as test criteria for every product. All specifications and features are subject to change without notice.

