mPath™

IOR CONCENTRATION MONITOR

Monitor protein concentration in real time

The mPath™ IoR concentration monitor provides accurate inline continuous measurement of product concentration in bioprocess fluids, enabling more rapid development and characterization of biotech processes. These measurements enable scientists to quickly see the impact of process changes on product yield, allowing fast determination of optimal process parameters.

Better insight into your process

Concentration measurements can give valuable insight into the performance of cells, the efficiency of clarification and purification steps, and the state of ultrafiltration operations. Continuous inline data collection enables better control and characterization of unit operations, reducing the chance of undetected process deviations and saving time.

More data means more process knowledge

Faster measurement of protein concentration enables faster characterization of processes, which empowers scientists to generate more knowledge and spend less time waiting for assays to deliver results.

Fig 1. mPath IoR concentration monitor

Features and benefits

Online sensors	• Data collected in real time (sample rate of 1 second), enabling responses to concentration without waiting for results from assays • No sampling required, enabling closed-system monitoring
Index of refractivity (IoR) measurement	• Outstanding accuracy and response time • Wider linear range than ultraviolet (UV) • Suitable for all typical bioprocess unit operations • Measures accurately even in non conductive fluids
Up to 4 sensors per monitor	• Collect concentration data simultaneously at multiple critical points in a process
3 m (10 ft) flow cell cable length	• Monitor all sensors from a single location in the room
No consumable or spare parts	• Virtually no hardware maintenance
Simple Windows application software	• Start up, calibrate and collect data within minutes
Compact sensors and monitor	• Use less laboratory space and easily transport the monitor
PTFE [1] sensors	• Suitable for cleaning and reuse, or single-use applications [2]

[1] Polytetrafluoroethylene
[2] Sensor must be sterilized by flush-through prior to use

Example applications

- Column switching in a continuous chromatography process
- Constant concentration monitoring in a tangential flow filtration (TFF) process, enabling you to stop when the desired concentration is reached
- Evaluating the protein retention of depth filtration
- Buffer preparation using IoR as a concentration indicator
- Measuring concentration in upstream and downstream processing

Organize a trial

Contact us to request an mPath IoR concentration monitor trial. During an on-site visit, we'll demonstrate the monitor's easy of use and generate trial-ready data for an evaluation.

Fig 2. mPath IoR concentration monitor flow cell.

Product specifications

Flow cell materials of construction•	• Flow cell body: PTFE • Optical window: Sapphire glass • Cable (non-wetted): Polypropylene (PP) • Bonnet (non-wetted): PP
Flow cell dimensions	90 × 90 × 20 mm
Flow cell mass	0.1 kg
Flow cell connections	¾ in. tri clamp connections
Monitor dimensions	183 × 193 × 34 mm
Monitor mass	0.5 kg
Monitor electrical requirements	24 V (DC), 0.5 A minimum
Power supply requirements (included)	110 / 240 V (AC), 50 / 60 Hz
Screen	26 × 77 mm LCD screen
Signal cable	RS-232 (monitor end) IP67 12-pole, 1 A panel mount connector (flow cell end)
Analog output	4 to 20 mA for temperature and IoR
Number of flow cells per monitor	Up to 4
Software	Windows-based interface for setup, monitoring, data logging and calibration.
System requirements for software	Windows 98 or higher, 128 MB RAM

Operating and performance information

Monitor ambient temperature operating range	20 to 30°C
Flow cell temperature range	5 to 50°C
Flow cell pressure range	0 to 5.5 barg (0 to 80 psig)
IoR range	1.28000 to 1.40000
Protein linear concentration range (monoclonal antibody)	0.003 to 320 g/L [3]
IoR accuracy	2×10^{-4}
IoR repeatability	2.5×10^{-5}
IoR resolution	1×10^{-5}
Response time	1.2 seconds standard (rolling average configurable)

[3] Theoretical linear range. Data confirms 0.1 – 250 g/L

Ordering information

Product	Product code
Kit containing the display unit and 1 flow cell – 1/16 in. bore	MPATHRI1-KIT16-1
Kit containing the display unit and 1 flow cell – ¼ in. bore	MPATHRI1-KIT04-1
1 flow cell, 1/16 in. bore [4]	MPATHRI1-FC16
1 flow cell, ¼ in. bore [4]	MPATHRI1-FC04
Flow cell connection cable	MPATHRI1-FCCBL
Signal cable (for spares only)	MPATHRI1-SIGCBL
Power cable (for spares only)	MPATHRI1-PWRCBL
Display unit and power cable, no flow cells (for spares only)	MPATHRI1-DDU1

[4] Does not include flow cell connection cable. If ordering as a supplemental flow cell, MPATHRI1-FCCBL will be required. If ordering as a replacement flow cell, a new flow cell connection cable is not necessary.

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For local office contact information, visit cytiva.com/contact

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