

ETA2020 Refractive Index & Viscosity Detector

Powered by
WINGPC UNITY
Data System

Unmatched Cost/Benefit Value



The **ETA2020** is a combination differential viscosity / differential refractive index (RI) detector for the measurement of macromolecular properties that are related to molar mass and concentration.

Accurate molecular weight distributions

Intrinsic viscosities

Mark-Houwink coefficients

Universal calibration

Structure, branching architecture and degree of branching

Designed to maximize sensitivity and signal-to-noise ratio, while minimizing the sample cell volume, this detector provides supreme Cost/Benefit advantages:

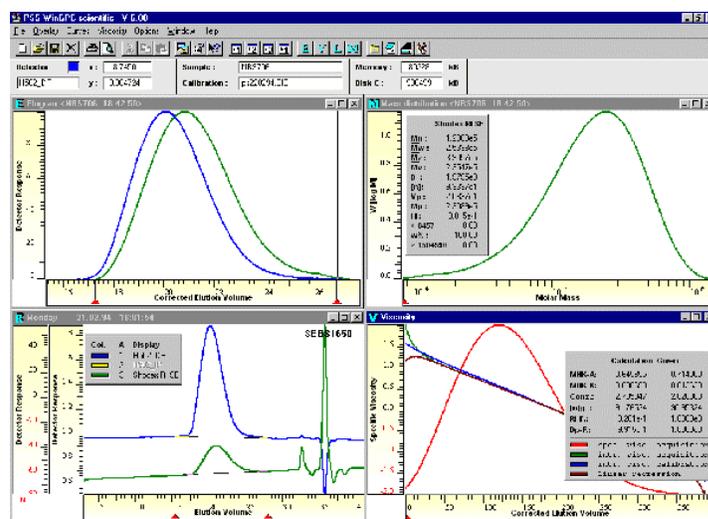
The *asymmetric Viscometer* operates based on the measurement of differential pressures, where the network of asymmetric flow resistances guarantees high sensitivity, even in the low molecular weight range. *Self-degassing pressure transducers* and a temperature-controlled cell up to 80°C, (optional to 150°C) allow trouble-free operation over a long period.

The ETA-2020 includes a 16-bits microprocessor, which allows user-friendly handling of all functions of the instrument. Pressure and temperature data is transferred to a Personal Computer via standard serial interface RS-232.

PSS WinGPC Unity is the only software that seamlessly integrates all molar mass sensitive methods and detectors. Data can be processed/reprocessed online or post-run by freely selecting the appropriate data analysis method or method combination.

The **viscosity module** lets you directly measure intrinsic viscosity without relying on any assumptions. Validated and proprietary viscometry data processing methods derive true molecular weights and reliable Mark-Houwink constants based on the universal calibration principle. The contraction factor g' can be measured across the molar mass distribution.

An example is shown of the Bird-eye-view that depicts the RI and viscosity chromatograms, the molecular weight distributions and viscosity law plots, as well as the branching index.



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Features

Lowest detection limit and excellent linearity: Achieved through low noise electronics combined with high sensitivity pressure transducers and superior sample path design.

Automatic or Manual Reference Cell and Transducers

Flush: Efficient flushing of the reference cell and the transducers is done via solenoid valve. Flushing can be triggered remotely via TTL signal, via RS-232 or be programmed into the Programmable Schedule Instrument Control (PSIC), allowing optimization for different solvents.

Programmable Schedule Instrument Control (PSIC):

Programmable timetables allow the user to perform many functions of the instrument automatically, for example to flush the reference cell after each run.

Temperature Control: The electronic heater allows user programmable temperature control between room and 80°C, reducing drastically the baseline fluctuations caused by temperature changes.

Standard Serial Interface (RS-232): The included standard serial interface allows data exchange between the instrument and a PC. The data passed to the RS-232 is acquired with 24-bit resolution. By this means remote control of the instrument's functions as well as data acquisition for later process are easily achieved. The used communication protocol is standard ASCII code. A different protocol can be implemented upon request.

Design

The ETA2020 consists of a network of identical flow resistances combined to build a bridge. The refractive index detector is part of this bridge. When pure solvent flows all branches of the bridge, the differential pressure measured by the DP pressure transducers is zero. When a sample is introduced, it is split at T1 in equal parts. On the reference path, the sample is diluted in Reservoir 1 assuring that only solvent continues to flow through this branch.

On the sample path the concentrated sample flows through the flow resistance causing a misbalance in the bridge, which is measured as a pressure difference by the DP pressure transducer. At the same time the refractive index detector will detect the concentration of the sample here. A second pressure transducer measures the absolute pressure drop across a resistance flown only by solvent. The measured differential pressure is proportional to the specific viscosity of the sample..

The implementation of the refractive index detector in the bridge assures that the volumetric offset between the two methods, real and apparent, is much lower than in any other possible combination of viscometer and concentration detectors

Viscometer Specifications		Refractive Index Detector Specifications		Common Specifications	
Differential Pressure Range	± 5.0 kPa	Refractive Index Range	1.00 to 1,75	Total Detector Volume	≈ 40 ml (including Reservoirs)
Differential Pressure Gains	1, 2, 4, 8	Cell Volume	8 µl	Temperature accuracy	± 0.5 °C
Analog Output (integrator)	10.0 Volt / 5 kPa FSD Differential Pressure 10.0 Volt / 100 kPa FSD Inlet Pressure	Measurement Ranges (ΔRIU Full Scale)	6x10 ⁻⁴ , 3 x10 ⁻⁴ 1.5x10 ⁻⁴ , 7.5x10 ⁻⁵ , 3.75x10 ⁻⁵ , 1.87 x10 ⁻⁵ , 9.3 x10 ⁻⁶ , 4.6 x10 ⁻⁶ , 2.3 x10 ⁻⁶	Data Transfer Rate (baud)	4800, 9600, 19200, 38400, 57600, 115200
Sample Cell Volume	15 µl	Noise Level	< 2.5x10 ⁻⁹ ΔRIU, 25 °C	Digital Interface	RS-232C
Shear Rate (1.0 ml/min)	≤ 2700 sec ⁻¹ 0.2 Pa, diff.	Analog Output (integrator)	10.0 Volt FSD, 1.0 Volt FSD	Temperature stability	> 0.01 °C
Noise Level	Pressure Channel, 25 °C			Digital Inputs	Flush, Zero, Sync, Error
Inlet Pressure Range	0 to 150 kPa			Digital Outputs	Sync, Error

Ordering Information

ETA 2020

Differential Viscometer with Refractive Index Detector.



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