



AUTOMATIC DIGITAL POLARIMETER - TORONADP™ 200

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Automatic Digital Polarimeter ToronADP™ 200 is a fully automatic, constant-temperature polarimeter for measuring optical rotation and reporting specific rotation, concentration, and sugar degree. Built-in Peltier temperature control supports stable measurements when samples are temperature sensitive. The system is designed for routine testing in chemical and pharmaceutical labs, plus food and sugar-related workflows.

ToronADP™ 200 uses an LED cold light source with a high-precision interference filter to deliver a stable polarimetric wavelength at 589.3 nm. Measurement modes cover optical rotation, specific rotation, concentration, sugar, and custom formula calculations for flexible reporting. A large 10.4-inch touch color display supports method-driven operation with quick navigation for daily work.

Documentation controls support labs that need traceable electronic records. Audit trail, electronic signature, and multi-level permission management are included in the specification. Network printing plus PDF and Excel export support reporting and review workflows across teams.

APPLICATIONS

Automatic Digital Polarimeter - ToronADP™ 200 Applications

- Pharmaceutical QC and research: Optical rotation testing supports identity checks for chiral substances and helps track batch-to-batch consistency. Specific rotation calculations help labs compare results under defined tube length, wavelength, and temperature conditions. Documentation features support controlled reporting when required by internal QA procedures.
- Chemical manufacturing and academic labs: Polarimetry supports concentration checks, method development, and verification of optically active intermediates. Multiple measurement modes and custom formulas help standardize

calculations across different product lines. Continuous and multiple measurement functions help evaluate stability during a measurement window.

- Food, spices, and dyes: Many organic crystalline substances and extracts show optical activity that can be tracked for quality trends. Stable wavelength control and temperature control help reduce variability during routine checks. Network printing and data retrieval support review when multiple batches are tested daily.
- Sugar analysis: Sugar degree measurement supports routine monitoring using polarimetric scales expressed in °Z. The instrument's sugar mode and controlled temperature range help keep results consistent during production and QC testing. Industry methods commonly reference ICUMSA guidance for sugar polarimetry.



Standards

- FDA 21 CFR Part 11 when electronic records and electronic signatures are used under regulated record requirements.

FEATURES

Automatic Digital Polarimeter – ToronADP™ 200 Key Features

- Constant-temperature polarimetry with Peltier control
 - Maintains a controlled sample temperature from 10 °C to 60 °C with 0.01 °C resolution and ± 0.03 °C control accuracy for stable measurements.
- LED cold light source at 589.3 nm with auto shutoff
 - Uses an LED source with a high-precision interference filter at 589.3 nm and automatically closes the light source when the instrument is idle.
- Multiple test modes for different workflows
 - Supports single, multiple, and continuous measurement modes for routine testing and method verification.
- Broad calculation capability
 - Measures optical rotation and supports calculations for specific rotation, concentration, sugar degree (°Z), and custom formulas.
- High performance for small rotation changes
 - Offers 0.001° minimum reading (with 0.0001° optional), $\pm 0.002^\circ$ accuracy, and repeatability reported as 0.002° standard deviation.
- Data integrity and user control tools
 - Includes audit trail, electronic signature, method library, and multi-level permission management for traceable workflows.
- Fast reporting with export and printing
 - Supports PDF/Excel export and printer options including universal printer and Wi-Fi printing.

- Lab connectivity and sample ID efficiency
 - Interfaces include USB, RS232, VGA, Ethernet, plus QR code scan input for sample identification.
- Real-time monitoring support
 - Provides optical rotation timing and real-time spectrum-style monitoring features to help confirm stability during measurement.



Theory and Method

Optically active compounds rotate the plane of polarized light, producing an observed rotation angle (α). The reported value depends on wavelength, temperature, tube length, and sample concentration, so controlled conditions improve comparability. Pharmacopeial methods describe how to measure optical rotation and calculate specific rotation for consistent reporting.

ToronADP™ 200 uses a 589.3 nm light source and supports single, multiple, and continuous measurement modes. Peltier temperature control stabilizes the sample environment across a defined range to reduce drift. Real-time monitoring functions support optical rotation timing and real-time spectrum-style observation during measurement.

TECHNICAL SPECIFICATIONS

Automatic Digital Polarimeter - ToronADP™ 200 Technical Specification

Specification	ToronADP™ 200
Measurement modes	Optical rotation, specific rotation, concentration, sugar, custom formula
Light source	LED cold light source + high precision interference filter; auto light shutoff when not testing
Working wavelength	589.3 nm
Test functions	Single, multiple, continuous measurement
Measurement range	Optical rotation $\pm 90^\circ$; sugar degree $\pm 259^\circ \text{Z}$
Minimum reading	0.001° (0.0001° optional)
Accuracy	$\pm 0.002^\circ$

Specification	ToronADP™ 200
Repeatability	0.002° (standard deviation, optical rotation)
Temperature control range	10 °C to 60 °C (Peltier)
Temperature resolution	0.01 °C
Temperature control accuracy	±0.03 °C
Display	10.4-inch TFT true color touch screen
Standard tubes	200 mm, 100 mm standard; 100 mm temperature-control tube optional (various lengths)
Transparency	0.01%
Data storage	64 GB
Automatic calibration	Yes (one standard tube included)
Audit trail	Yes
Electronic signature	Yes
Method library	Yes
Multifunction retrieval	Yes
Printing	Universal printer; Wi-Fi printing (one printer standard)
Cloud services	Yes
MD5 verification	Yes
QR scanning input	QR code scan input supported
Export formats	PDF and Excel
Communication interfaces	USB, RS232, VGA, Ethernet
Real-time monitoring	Optical rotation timing and real-time spectrum; zero position stability specification included

Specification	ToronADP™ 200
Operating system	Android OS with audit tracking, permissions, electronic signature, user enable/disable
Instrument grade	0.01 grade
Voltage	220 V $\pm$ 22 V, 50 Hz $\pm$ 1 Hz, 250 W (110V is also available)
Net weight	28 kg



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