

AUTOMATED DATA ACQUISITION AND CALCULATION SYSTEM



Automated Data Acquisition and Calculation System - ToronDACS™ 200

ToronDACS™ 200 is a dedicated automated data acquisition and calculation system designed to work in conjunction with the ToronCR™ 500 automatic trace carbon residue tester. This intelligent peripheral automatically collects gravimetric data from laboratory balances, computes residual carbon values from multiple sample groups, automatically calculates test repeatability, and prints results — all without requiring manual data entry or external computers.

The calculation system supports 1 to 12 calculation groups simultaneously and stores up to 200 data groups internally. Its 5.6-inch 65K-color true-color configurable touchscreen, RS-232 balance interface, power-off memory protection, and integrated printer make it a complete, compact data acquisition solution for carbon residue testing workflows. Compatibility extends to all major analytical balance brands with RS-232 communication interfaces, including Sartorius and Mettler Toledo.

APPLICATIONS

Automated Data Acquisition and Calculation System - ToronDACS™ 200 Applications

- Automated balance data collection and carbon residue calculation paired with the ToronCR™ CR-108 carbon residue apparatus
- Batch carbon residue result processing for 1 to 12 sample groups in a single test run
- Automatic repeatability calculation to verify test compliance with ASTM D4530 and ISO 10370 repeatability limits
- Laboratory data logging and printed record generation for quality control and regulatory documentation
- Integration with Sartorius, Mettler Toledo, and other RS-232-compatible analytical balances in petroleum testing laboratories
- Replacement of manual data acquisition workflows in carbon residue testing, reducing transcription errors and analyst time



FEATURES

Automated Data Acquisition and Calculation System - ToronDACS™ 200

Key Features

- Microcontroller-based design with a 5.6-inch 65K-color configurable touchscreen for intuitive, menu-driven operation
- Embedded software that automatically collects balance readings and calculates residual carbon values for each sample group
- Power-off memory protection ensures complete data integrity in the event of unexpected power interruption
- Compact and robust design with easy maintenance and high safety standards suitable for routine laboratory environments
- Integrated printer for direct, automatic result output without external devices or software
- RS-232 compatibility supports connection to major analytical balance brands including Sartorius and Mettler Toledo
- Versatile application across any laboratory workflow requiring automated balance data acquisition and calculation logging
- Calculation capacity of 1 to 12 groups per run with internal storage for up to 200 data groups
- Automatic printing of calculated carbon residue values and repeatability assessments

THEORY & METHOD

Theory and Method

ToronDACS™ 200 interfaces with one or more analytical balances via RS-232 serial communication. At each defined weighing step in the carbon residue test protocol — specifically the tare weight of the empty sample tube, the sample +

tube weight before pyrolysis, and the carbon residue + tube weight after pyrolysis — the system automatically captures the balance reading, associates it with the correct sample group, and stores it in non-volatile memory (power-off memory protection).

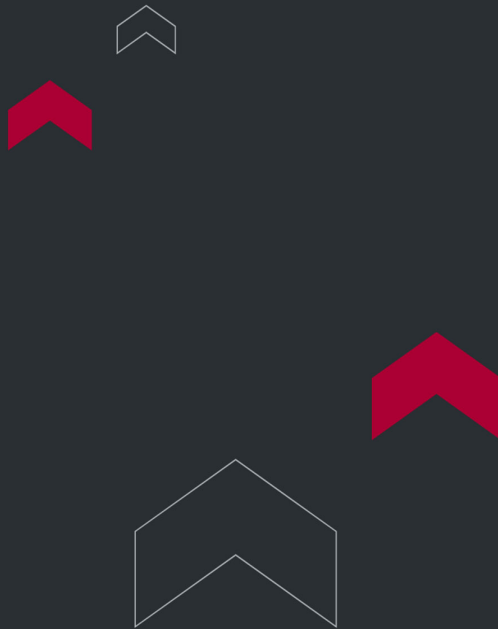
After all sample groups in a run are processed, the calculation system computes the carbon residue percentage for each group using the gravimetric relationship: $CR\% = (\text{mass of residue} / \text{mass of sample}) \times 100$. Repeatability across duplicate or replicate measurements is then automatically calculated and compared against the applicable method’s precision criteria. Results are displayed on the 5.6-inch touchscreen and printed automatically via the integrated printer without manual intervention.

TECHNICAL SPECIFICATIONS

Automated Data Acquisition and Calculation System - ToronDACS™ 200
Technical Specifications

Parameter	Specification
Calculation Capacity	1 - 12 groups
Data Storage	200 groups
Data Interface	RS-232
Printing	Automatic (integrated printer)
Data Protection	Power-off memory retention
Power Consumption	≤ 10 W
Screen Display	5.6-inch 65K-color true-color configurable touchscreen
Main Unit Size (W × D × H)	220 × 180 × 130 mm

Parameter	Specification
Voltage	AC 220 V $\pm$ 10%, 50 Hz $\pm$ 10% (110V is also available)
Relative Humidity	< 80% RH
Ambient Temperature	20 - 25 °C
Other Notes	No strong vibration, airflow, strong electromagnetic interference, or corrosive gases near instrument



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