

## DUMAS NITROGEN / PROTEIN ANALYZER TT- D50/D200



The Dumas Nitrogen / Protein Analyzer TT-D50/D200 assesses the nitrogen/protein levels in samples using combustion, purification, reduction, and thermal conductivity detection.

Dumas Nitrogen / Protein Analyzer TT-D50/D200 efficiently analyzes a single sample within 4 minutes, eliminating the need for pretreatment. Additionally, it uses a non-toxic and harmless reaction process to ensure both safety and environmental friendliness.

## APPLICATIONS

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- **Food & Agriculture:** Determines protein and nitrogen content in cereals, grains, seeds, meat, dairy, and animal feed for nutritional analysis and quality control.
- **Beverage Industry:** Analyzes protein levels in wine, beer, and other beverages to ensure product consistency and regulatory compliance.
- **Environmental & Soil Testing:** Assesses total nitrogen levels in soil, fertilizers, and agricultural samples to support research and environmental compliance.
- **Petrochemical & Automotive:** Measures nitrogen in diesel exhaust fluid (DEF) to meet emission standards and industry regulations.
- **Rubber & Latex Industry:** Evaluates nitrogen content in natural rubber and latex according to ISO testing guidelines for product quality assurance.
- **Pharmaceuticals & Healthcare:** Supports nitrogen and protein testing in medicinal products, excipients, and nutritional supplements for safety and accuracy.
- **Research & Standards Compliance:** Adopted by AOAC, ISO, AACC, ICC, and DIN for standardized protein and nitrogen determination across industries.

## FEATURES

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## Precise control experiment

- Significant Capacity: Dumas Nitrogen / Protein Analyzer TT-D50/D200 Utilizes a 1-disc 120-position autosampler (exclusive to D200) for analyzing a vast number of samples directly.
- Swift Performance: The fast cooling feature enables the device to reach shutdown temperature within 30 minutes.
- High-Quality: Incorporates SMC® core pneumatic components and BronkhorstÂ® mass flow controllers, ensuring enduring reliability.
- Cost-Efficiency: Implements new consumables and efficient metal condenser dewatering technologies, extending the device's service life.

### Dumas Nitrogen / Protein Analyzer TT-D50/D200

- Two-stage combustion and oxidation: Initial pure oxygen combustion in the primary combustion tube aids in the preliminary oxidation and digestion of the sample. The remaining portion passes through the secondary combustion tube along with the carrier gas, undergoing complete digestion after oxidation by the Pt catalyst and copper oxide mixture.
- Three-stage dewatering: Electronic condensation removes most of the water, enabling the desiccant to function effectively. Primary and secondary drying tubes further eliminate residual water.
- Efficient reduction: An effective reduction agent converts nitrogen oxides into nitrogen gas and absorbs excess oxygen.
- TCD detection: The thermal conductivity detector (TCD) identifies the nitrogen produced as a result of reduction.

## Applications

The Dumas Nitrogen / Protein Analyzer TT-D50/D200 finds extensive application in assessing the total nitrogen content present in diesel exhaust fluid, cereals (grains), seeds, meat, meat products, animal feed, dairy products, red wine, fertilizers, and soil.

## Dumas Nitrogen / Protein Analyzer TT-D50/D200

The Dumas Nitrogen / Protein Analyzer TT-D50/D200 method is extensively used as a standard procedure by various organizations:

- AOAC utilizes the Dumas method to determine the crude protein content in grains, oilseeds, meat/meat products, and animal feed.
- ISO uses the Dumas method for assessing the quality of cereals, pulses, ground cereal products, oilseeds, and animal feed.
- AACC and ICC utilize this method to determine grain protein content.
- ISO and DIN use the Dumas method for evaluating dairy products.
- AOAC and ISO/DIN designate this method as the standard for determining total nitrogen in fertilizers and soils.
- ISO, in its 2015 publication, uses this method for determining nitrogen content in natural raw rubber and natural latex.

## Dumas Nitrogen / Protein Analyzer TT-D50/D200

### **Sampling System**

- In Dumas Nitrogen / Protein Analyzer TT-D50/D200 1-disc 120-position autosampler (Exclusive to D200) allows direct analysis of a substantial sample size.
- SMC® pneumatic components can perform up to 100,000 sample injections with minimal maintenance costs.
- The anti-interference infrared modules enable contactless, in-situ detection. They trigger self-tests and display messages to prevent malfunctions if the sampling disc is occupied (D200 Only).
- Users have the freedom to add samples—solid or liquid—during preparation, boosting experimental efficiency without interrupting the automatic analysis process.

## Combustion Furnace System

- The high-temperature, pure oxygen, and two-stage combustion process guarantee thorough oxidation and digestion of samples.
- An effective metal condenser and two-stage desiccants completely eliminate water. These desiccants can be reused up to 2,000 times.
- New consumables decrease nitrogen oxide levels, absorb excess oxygen, and extend the device's lifespan. Both combustion and reduction tubes are reusable for up to 1,000 times.

## Pneumatic System

- A two-stage regulator mitigates the effects of external pressure fluctuations and combustion-induced pressure changes on the detector system, ensuring system stability.
- PTFE fittings and SMC® quick couplers enable clear observation of contaminants and facilitate maintenance without the need for tools.
- The combustion tube and joint, utilizing an original pneumatic connector (patent number: CN106443029B), support easy assembly and disassembly. This design eliminates air leakage caused by irreversible wear of ferrule compression fittings.

## Software Function

- Windows Version streamlines operations and enhances efficiency. It allows users to configure parameters and conditions, controlling the computer for data collection, processing, storage, and printing.

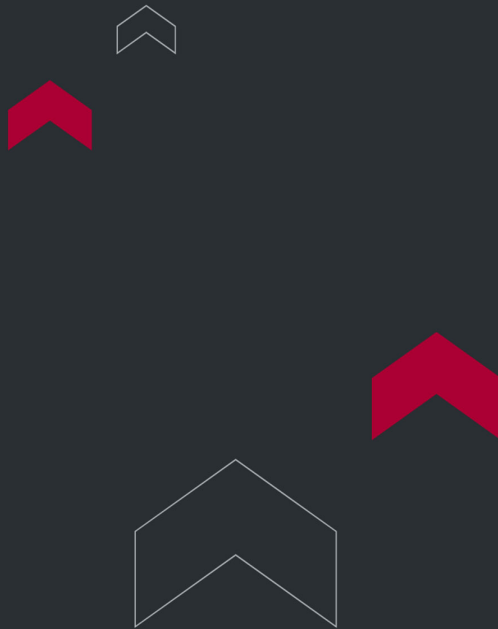
- Wireless balance data communication: An industrial wireless module automatically collects weight data within a maximum distance of 100 meters. The data display window and voice authentication function (D200 Only) can adjust values.
- Air leakage inspection: The gas path can be checked automatically or manually, providing user convenience.
- Custom lab report: Report formats, company names, logos, etc., are customizable.
- Standby/wake-up function: Reduces on/off frequency, enhancing experimental efficiency. Standby mode lowers carrier gas usage, power consumption, and costs.
- Intelligent oxygenation function: The software adds oxygen as needed based on changing conditions and samples, reducing the use of reduction agents.
- Solution library: Built-in solution library eliminates the need to develop new approaches.
- Periodic maintenance reminder: Timely reminders for consumable replacement based on sample features, quantity, oxygen consumption, etc.
- Self-diagnosis: Users can select from 23 fault diagnosis methods for automatic pop-up alarms if experimental conditions or preparations are not up to standard.
- Data processing: Experimental results easily obtained through Relative Standard Deviation (RSD) and mean value calculations.
- Calibration method: Accurate experimental data output through single or multiple point calibration.
- Audit trail: The software follows user permission hierarchy rules for traceability according to FDA 21 CFR Part 11 (D200 Only).
- LIMS integration: Software shares data with the laboratory information management system.

## TECHNICAL SPECIFICATIONS

|                     |                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------|
| Working Environment |                                                                                                  |
| Power supply        | 220V AC $\pm 10\%$ 50Hz (110V is also available. Please specify when ordering)                   |
| Computer            | A laptop or a desktop operated with Windows 7 or above and equipped with USB or RS 232 interface |
| Temperature         | 5°C $\square$ 30°C                                                                               |

|                                    |                                                                   |
|------------------------------------|-------------------------------------------------------------------|
| Humidity                           | ≤85%                                                              |
| Technical Parameters               |                                                                   |
| Analysis efficiency                | 3-4 min each                                                      |
| Weighing accuracy                  | ≤0.1mg                                                            |
| Detection range                    | 0.1-500mg nitrogen                                                |
| Detection recovery rate            | ≥99.5%                                                            |
| Relative standard deviation (RSD)  | ≤0.5% (150mg standard 10% nitrogen)                               |
| LOD                                | 0.01mg nitrogen                                                   |
| Sample weight                      | Solid ≤1g, liquid ≤1mL                                            |
| Operating system                   | Windows 7 and above                                               |
| Sampler                            | D200:1 disc x 120 1 disc x 40 positions D50:1 disc x 60 positions |
| Detector                           | TCD                                                               |
| TCD accuracy                       | ≤0.01℃                                                            |
| Carrier gas                        | CO2                                                               |
| Furnace temperature                | 1200℃ (MAX)                                                       |
| Carrier gas purity                 | 99.999%                                                           |
| Oxygen purity                      | 99.999%                                                           |
| Internal module communication mode | RS-485 bus                                                        |
| Peripheral interface               | RS232, USB                                                        |
| Correction method                  | Linear or nonlinear calibration, custom calibration curve         |
| Rated power                        | 2000W                                                             |

|                    |                                     |
|--------------------|-------------------------------------|
| Dimensions (L×W×H) | 28.9 inches X 22 inches X 22 inches |
| Net weight         | 176.4 lbs.                          |



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