

FP-528 Nitrogen/Protein Determinator

Specification Sheet

Instrument Range @ 250 mg

3 cc Aliquot Loop:	160 ppm or 0.016% to 100% or 0.04 to 300 mg absolute Nitrogen
10 cc Aliquot Loop:	80 ppm or 0.008% to 40% or 0.02 to 100 mg absolute Nitrogen

Precision @ 250 mg

3 cc Aliquot Loop:	80 ppm or 0.5% RSD, whichever is greater
10 cc Aliquot Loop:	40 ppm or 0.5% RSD, whichever is greater

Readability 0.001%

Calibration Standard Samples; Linear, Quadratic, or Cubic Polynomial

Analysis Time 3 minutes nominal

Sample Size 250 to 350 mg nominal

Detection Method Thermal Conductivity

Chemical Reagents Anhydrous Magnesium Perchlorate, Calcium Oxide, Sodium Hydroxide on an inert base, Copper Sticks, N Catalyst Reagent, Copper Turnings, Alumina Pellets, Magnesium Oxide

Gas Required

Carrier Gas:	99.99% Helium or Argon 40 ±4 psi (2.76 bars)
Combustion Gas:	99.99% Oxygen 40 ±4 psi (2.76 bars)
Pneumatic Gas:	Compressed Air, <i>source must be oil and water free</i> , 40 ±4 psi (2.76 bars)

Gas Flow Rates

Carrier Gas:	Analysis: 200 mL/min (measure), 30 mL/min (reference) Conservation: 30 mL/min (measure), 30 mL/min (reference)
Combustion Gas:	1.3 to 6 L/min (user programmable oxygen profile)

Regulators

Helium:	0 to 125 psi, CGA 580, 15/16-14 Female R.H.
Oxygen:	0 to 125 psi, CGA 540, 7/8-14 Male R.H.
Air:	0 to 125 psi, CGA 346, 13/16-14 Male R.H.

Furnace Range Up to 975° Celsius

Weights (approximate)

Determinator:	230 lb. (104 kg)
Computer:	50 lb. (23 kg)
Monitor:	40 lb. (18 kg)
Total Shipping:	320 lb. (145 kg)

Physical Dimensions

Determinator:	28 in. H x 21 in. W x 23 in. D (71 cm x 53 cm x 58 cm)
Computer:	17 in. H x 8 in. W x 17 in. D (43 cm x 20 cm x 43 cm)
Monitor:	15 in. H x 14 in. W x 16 in. D (38 cm x 36 cm x 41 cm)

Electrical Power Requirements

Determinator:	230 V~ (±10%), 50/60 Hz, 10 A
Computer:	115/230 V~ (±10%), 50/60 Hz, 5/3 A
Monitor:	90 to 264 V~, 50/60 Hz, 1.6 A (max)
Balance:	120 V~ (±10%), 60 Hz, 0.5 A (max)

DSP Memory (Digital Signal Processor) 50 analysis results
10 sample weights

Display

Type:	Liquid Crystal
Size:	8 cm x 10 cm

Printer (optional)

Color Inkjet Printer
Dot Matrix Printer

Autoloader (optional)

1 to 4 stackable 35-Position
Carousels, 136 samples (max)

Part Numbers

FP528	Nitrogen/Protein Determinator with DSP Control
FP528LC	Nitrogen/Protein Determinator with Autoloader, Windows® Software, Current PC Tower, and Monitor
FP528LCF	Nitrogen/Protein Determinator with DSP Control, Autoloader, Windows® Software, Current PC Tower, and Monitor

V~ denotes VAC.



Theory of Operation

The FP-528 Determinator is a microprocessor-based, software-controlled instrument that determines the nitrogen content in a variety of foods, feeds, and organic matrices.

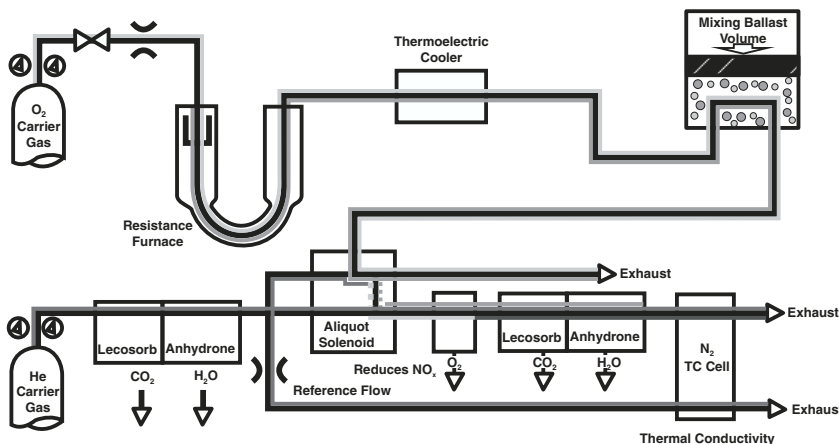
There are three phases during an analyses cycle: purge, burn, and analyze. In the sample drop purge phase, the encapsulated sample is placed in the loading head, sealed, and purged of any atmospheric gases that have entered during sample loading. The ballast volume (zero volume at his point) and gas lines are also purged.

During the burn phase, the sample is dropped into a hot furnace (850°C) and flushed with pure oxygen for very rapid combustion. The products of combustion, mainly CO₂, H₂O, NO_x, and N₂, are passed through the furnace filter, thermoelectric cooler, and then collected in the ballast volume.

In the analysis phase, the combustion gases in the ballast are mixed to a homogenous state through turbulent mixing. The piston within the ballast then forces the homogenous gas through a sampling valve where a 3 cc aliquot is captured. Helium carrier gas sweeps the aliquot through hot copper to remove excess Oxygen and reduce NO_x to N₂. The gases then pass through Lecosorb and Anhydrone to remove carbon dioxide and water. The thermal conductivity cell measures the remaining combustion product, nitrogen, in the helium carrier.

An extensive leak check procedure is available from the Diagnostic menu to help locate any oxygen or helium system leak that may develop during operation. The final result is displayed as weight percentage of nitrogen (or protein if selected). Results can be calculated on a user-edited moisture basis.

Basic Flow Diagram



Specifications and part numbers may change.
Consult LECO for latest information.

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