

Leading the way in

TKN Analysis

Precision TKN (Total Kjeldahl Nitrogen) Analyser

TKN
Digester



Fully automated
Kjeldahl Distillation Unit
with inbuilt titrator



TKN
Scrubber



Total Kjeldahl Nitrogen Method

Total Kjeldahl Nitrogen (TKN) analysis is a standard method for determining nitrogen content in variety of samples, such as

- Food & Feed
- Agriculture products
- Pharmaceuticals
- Soil
- Water
- Wastewater

The method is widely used in food and animal feed industries to determine protein content for ensuring compliance with national and international food labeling regulations.

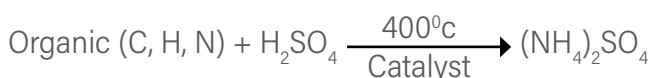


Measurement Principle

A Precision TKN (Total Kjeldahl Nitrogen) Analyser determines the total concentration of organic nitrogen and ammonium in a sample using the Kjeldahl method. This method involves three main steps.

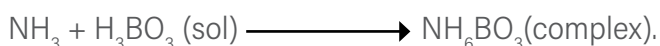
Step 1: Digestion:

The sample is digested with concentrated sulfuric acid, often in the presence of catalysts like copper sulfate and potassium sulfate, to decompose organic matter. This process converts organic nitrogen into ammonium sulfate.



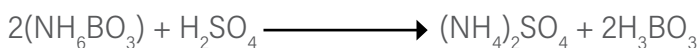
Step 2: Distillation:

The digested solution is made alkaline by adding a strong base, e.g., sodium hydroxide. This converts ammonium ions into ammonia gas, which is then steam distilled from the solution and absorbed in known volume of standard boric acid solution where it forms ammonium borate complex.



Step 3: Titration:

The amount of ammonia (which represents the nitrogen content in the sample) is determined by titrating ammonium borate complex with standard sulfuric / hydrochloric acid.



Precision TKN Analyser complies with following international standards.

Nitrogen: AOAC
955.04 / 981.10 /
DIN EN 15750/
AOAC 973.48

Nitrogen: USP
461 / Ph.Eur. 2.5.9.
/ AOAC 960.52
Protein: Ph.Eur.
2.5.33.

Nitrogen: DIN EN
13342 / 38409
AOAC 993.13

Precision TKN Analyser



Precision TKN Analyser is designed to meet requirements of wide applications as per international standards for measurement of Total Kjeldahl Nitrogen, Ammoniacal Nitrogen and available Nitrogen in the soil. The instrument offers:

7" color touchscreen display

SS 316 anti-corrosive body

50 presets and 10 user settable programs

Built in titration facility to get accurate, fast and error free results

Printer facility (optional)

Measurement mode for TKN & Protein, Ammoniacal Nitrogen and Available Nitrogen in Soil

User-friendly operations

Auto cleaning after completion of each analysis

Data storage for 10000 results with export in excel and pdf format

Reagent level sensor with alarm

Technical Specifications

Model name	Precision TKN Analyser
Distilled water addition	Automatic
All reagent addition	Automatic
Steam addition	Automatic
Steam power	10-100%
Process indication on display	Yes
Water level controller for steam generator	Yes
Automatic addition of KMnO_4 for soil analysis	Yes
Residue drain from titration cell	Yes
Residue drain from digestion cell	Yes
Display	7" colour touch screen display
Reagent level sensor	Yes
Digestion tube capacity	300 ml
Distillation time	0-10 min
Door close sensor	Yes
Programs	50+ Presets & 10 user settable
Measuring Range with RSD	TKN: 0 to 100% TKN ($\text{RSD} \leq 1\%$) Protein: 0 to 100% ($\text{RSD} \leq 1\%$) NH ₃ -N: 0 to 500 mg/L ($\text{RSD} \leq 3\%$) Available Nitrogen in Soil : 0 to 1000 kg/ha ($\text{RSD} \leq 3\%$)
Nitrogen recovery	> 99.5%
PC connectivity	Yes
Titration type	pH based (Potentiometric)
Power supply	230 V AC, 50 Hz
Current consumption	10A
Power Consumption	2.0 kW
Dimension (L x W x H)	455 mm x 505 mm x 800 mm
Weight	47 Kg

TKN Digester



Technical Specifications

Model name	TKN Digester
Enclosure body	SS 316
Temperature range	upto 450 °C
Temperature setting repeatability	1 °C
Over temperature protection	Yes
Temperature stability at 100 °C	± 2 °C
Heating time 20 to 400 °C at 230 V	~35 min
Auto OFF after achieving set time	Yes
Auto over temp. protection	Yes
Auto Error Indication	Yes
Integrated auto sequencing time / temperature	Yes, up to 8
Digestion Tubes	12 Nos.
Digestion Tube capacity (ml)	300 ml
Exhaust Manifold	Yes
Suction assembly	Yes
Power supply	230 V AC, 50 Hz
Dimension (L × W × H)	415 mm × 304 mm × 695 mm
Power consumption	1800 W
Weight	27 Kg

TKN Digester is a state of the art high-temperature thermal block digester controlled by a PLC. During the digestion process, organically bonded nitrogen is converted into ammonium ions, while organic carbon and hydrogen form carbon dioxide and water, respectively.

As the organic material undergoes digestion, it carbonizes, which can be observed as the transformation of the sample into black foam. During the process, the foam gradually decomposes, and the reaction is considered complete when a clear liquid is obtained. After the digestion has led to a clear liquid, an additional digestion time of ~30 minutes is recommended to ensure complete mineralization.

TKN Scrubber



Technical Specifications

Model name	TKN Scrubber
Stages	4 stages
Scrubbing solution bottle capacity	2 L Alkali & 2 L Water
Flow	30 LPM
Temperature stability at 100 °C	± 2 °C
Power supply	230 V AC, 50 Hz
Current consumption	1 A
Enclosure body	SS 316
Dimension (L x W x H)	415 mm x 304 mm x 695 mm
Weight	20 Kg

TKN Scrubber is essential for safe, efficient, and environmentally responsible nitrogen analysis in laboratories. It plays a critical role in neutralizing acidic and toxic fumes (e.g., sulphur dioxide, nitrogen oxides) generated during the digestion process. It comes with anti corrosive SS 316 enclosure.

The scrubber helps neutralizing toxic fumes by its 4-stage mechanism.

Stage 1: Condensation via condenser

Stage 2: Neutralization by distilled water

Stage 3 : Neutralization by Alkali

Stage 4 : Neutralization by carbon filter



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