



Automatic steam distillation unit Kjeldahl "Pro-Nitro A"

DETERMINATION OF ORGANIC NITROGEN (KJELDAHL METHOD)
FULLY AUTOMATIC OPERATION. FROM THE REAGENT DOSAGE TO THE TITRATION.



Steam distillation system Kjeldahl, complete with automated "ON-LINE" analysis (evaluation in real time). For systematic precise analysis, with minimum personnel intervention, simple and safe. Adequate for a laboratory with a medium to large throughput of samples.

The Kjeldahl steam distillation unit «PRO-NITRO A» evaluates the distillate at the same time as it is produced (evaluation «On-Line»), the evaluation and distillation are completed as one operation, reducing drastically the analysis time. This type of evaluation offers the following additional advantages: detects the point where the sample no longer produces Nitrogen, which means that, the distillation stops at the optimum maximum Nitrogen recovery and does not prolong the analysis longer than necessary.

The titration is a colorimetric method and is accepted by AOAC and does not require any periodic calibration.

FEATURES

- Distillation by steam generation.
- Automatic «On-line» colorimetric evaluation.**
- Steam generator with safety thermostat, over temperature and over pressure device.
- Safety, door closed, that prevents distillation if open.
- Detects that a digestion/distillation tube is present. This prevents the dosing of NaOH if there is no tube located.
- Universal adapter for MACRO (Ø 42 mm) and MICRO (Ø 26 mm) distillation tubes.
- Space saving in the laboratory:** the reservoirs for the H₂O, NaOH, Boric Acid and HCl are located inside the unit.
- Empties the digestion/distillation tubes and the collector automatically.**
- Automatic stop when distillation is complete.
- Large LCD display of 20 x 4 characters.
- RS232 output to results printer.
- Main system made from stainless steel with an ABS plastic front.

SPECIFICATIONS

- Measuring range: 0.2 to 200 mg Nitrogen.
- Nitrogen recovery: > 99.5%
- Distillation speed: from 35 to 45 ml/minute
- Coolant water consumption: 80 to 100 litres per hour.
- Steam generator water consumption: 2.5 Litre/Hr.
- Steam generator water reservoir capacity: 6 litres.
- NaOH reservoir capacity: 2 Litres.
- Boric Acid reservoir capacity: 2 Litres.
- Titrant reagent reservoir capacity: 2 Litres.
- Evaluation precision: 1.5%
- Minimum reagent dose 0.01 ml.

ALARMS

- Low water level for the steam generator.
- Safety door open or no distillation/digestion tube in place.
- Steam generator over temperature.

ADDITIONAL REQUIREMENTS

To complete Kjeldahl Nitrogen analysis a digestion block is also required. (See Bloc Digest pages 251 and 252).

MODEL

Part No.	Height / Width / Depth cm	Power W	Weight Kg
4002430	75 50 50	1800	38

Supplied complete with a MACRO Ø 42 mm tube, set of connection tubes, set of reservoirs, 250 ml. of mixed indicator 4.8 and 100 gr. of sulphate ammonium.

AUTOMATION

- Closing and opening of the condenser cooling water in line with the distillation process.
- Dosing of Boric Acid.
- Dosing of NaOH once the distillation has started.
- Select NaOH and Boric Acid volume.
- «On-line» evaluation of distillate.
- Auto detection of the end of the distillation process.
- Special functions to maximise performance.
- Special functions for maintenance.

REAGENTS

- All the reagents used in the «PRO-NITRO A» are easily located:
- Solution of 30-40% NaOH.
 - Solution of Boric Acid at 1% concentration (approx.) with mixed indicators (Bromo-cresol green and methyl red).
 - Reagent for titration: HCl or H₂SO₄ from 0.05N or 0.25N adjusted to 0.001 Normal.



CONTROL PANEL

- Menu to configure the date, time and selectable parameters.
- Print the analysis information using the optional printer 4120113, purchased as an accessory.
- <<ESC>> to cancel changes and escape from the menu.
- Increase values and navigation through the menu.
- Decrease values and navigate through the menu.
- <<ENTER>> to accept changes to parameters and navigation through the menu.
- LCD display to visualise parameters and results

ADVANTAGES

- Excellent precision on results.
- Complete Nitrogen recovery from the sample.
- Minimum operator intervention.
- No calibration required.
- Minimum analysis time.

RESULTS

The results can be downloaded to a printer (Optional), required for GLP, and includes the following data:

- Consecutive unrepeatable I.D. number of analysis.
- Date and time.
- Volume of NaOH.
- Volume of Boric acid.
- Reagent normality.
- Nitrogen detected.

15/10/05 12:16:08
Analysis Nr: 087598
NaOH: 75ml.
Boric: 25ml.
Normality: 0.1503
Results:
Reagent: 10.521ml
Nitrogen: 22.1382mg

ACCESSORIES

Ink printer (not thermal paper), size (4/6/10 cm) suitable for use with the PRONITRO A. Paper 2 1/4" (56 mm) wide. Interface RS232. Includes interface and mains cables. Part No. **4120113**

Digestion and distillation tube. Series MACRO of 250 ml volume. Graduated to 100 ml 42 mm Ø x 300 mm high. Part No. **4042300**



Tube for digestion and distillation. Series MICRO of 100 ml volume. 26 mm Ø x 300 mm high. Part No. **4001045**



QUALITY CONTROL INFORMATION

ALL OF THE KJELDAHL DISTILLATION UNITS 4002430 REQUIRE A PROTOCOL ASSAY FOR THE RECOVERY OF NITROGEN WHEN MANUFACTURED. THESE RESULTS COME WITH THE EQUIPMENT AND ARE VALID FOR IQ AND OQ CLARIFICATION.

COMPLEMENT



Digital colorimeter "Pro-A 520"

MICROPROCESSOR CONTROLLED.
AUTOMATIC ZERO ABSORBANCE AND 100% TRANSMITTANCE.
ALPHANUMERIC 20 CHARACTER 2 LINE L.C.D. DISPLAY.

APPLICATIONS

Reagent preparation for Pro-Nitro A.

FEATURES

- Wavelength range: 400 to 800 nm, by using special filters.
- Standard filter: 520 nm.
- Expanded Absorption range: -0.3 to 3.5 O.D.
- Transmission: 0 to 100 T %.
- Photometric accuracy: >1 % @ 1.000 A.
- Photometric precision: ±1 % @ 1.000 A.
- Photometric stability: 0.004 A/hr. @ 0.000 A.
- Light source: Long life tungsten lamp.
- Detector: Solid state.
- Sample chamber: 10 mm cuvettes.
- Minimum volume: 1 ml.
- Display: Alphanumeric LCD display of 2 lines of 20 characters.
- Calculation functions: Transmission T %.
- Absorbance, Concentration by factor or standard concentrations.
- Calibration: Self adjusting by software.
- RS-232 interface.**



CONTROL PANEL

- ON/OFF switch.
- Interactive LCD display.
- Numeric and function keypad.

SPARE

- Lamp of 6 V / 6 mm.
- Part No. **4512009**

MODEL

Part No.	Built in printer	Height / Width / Depth cm	Power W	Weight Kg
4120029	NO	11 18 28	10	4.5