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## Dry block for Determination of Organic Nitrogen by the Kjeldahl method



### Models Macro and Micro

- THE EQUIPMENT FOR THE DETERMINATION OF ORGANIC NITROGEN IS MADE OF TWO BASIC ELEMENTS:
- BLOCK DIGESTER (MINERALISATION) WITH PROGRAMMABLE TEMPERATURE CONTROL AND GLASSWARE (MACRO 250 ml AND MICRO 100 ml).
  - DISTILLATION UNIT "PRO-NITRO M", "PRO-NITRO S" (SEMI-AUTOMATIC) AND "PRO-NITRO A" (AUTOMATIC).



## Digestion Block "Bloc-digest"

### FEATURES

- Minimal sample manipulation
- Uniform heating.
- Capacity to store 20 programs of 4 steps for temperature and time.
- RS-232 port for temperature register and digestion program from a PC.
- Gas collection system that does not require special water jet pumps.
- Supplied complete with:
  - 1 metal heater block.
  - 1 programmer for time and temperature
  - 1 tube support rack
  - 1 gas collector
  - Digestion tubes.



Complete unit with: Dry-block connected to a programmable process unit, (time and temperature) rack support for tubes and fume extractor.

### MODELS - COMPLETE UNIT MACRO

MACRO	Part No.	No. of positions
Bloc Digest 6	4000629	6
Bloc Digest 12	4000630	12
Bloc Digest 20	4000631	20

### MODELS - COMPLETE UNIT MICRO

MICRO	Part No.	No. of positions
Bloc Digest m 12	4001047	12
Bloc Digest m 24	4001048	24
Bloc Digest m 40	4001049	40

### ACCESSORIES: EXTRACTION SYSTEM AND NEUTRALIZATION OF ACID VAPOURS



Digestion block

"Scrubber"

Re-circulating vacuum pump.

Reduces water consumption, no requirement for a constant connection for mains water.  
Prevents emission of gas vapours and acidic water to waste.  
Low noise level (<65dBA)  
Re-circulating pump made from chemically resistant materials

#### "Scrubber" unit

Part No.	Height / Width / Depth (exterior) cm	Weight Kg
4001611	32 31 16	2

It is supplied with 3 Kg. acid vapours neutralizer solution.  
**Spare part:**  
3 Kg. acid vapours neutralizer solution.  
**Part No. 4001610**

Specially designed to absorb and neutralize vapours generated in the Kjeldahl digestion processes.

Extraction system and neutralization of vapours.

Composed of a "Scrubber unit" that blocks the passage and neutralizes the condensed acids, and a re-circulating water pump that produces sufficient vacuum to aspirate the vapours.

It is essential to put the "Scrubber" unit together with the neutralizer solution between the digestion block and the re-circulating pump.

#### Water recirculation vacuum pump

Part No.	Height / Width / Depth (exterior) cm	Vacuum level bar	Pump rate Litres/minute	Weight Kg
4001612	44 39 28	0.98	10	10

## PARTS LIST AND ACCESSORIES

### Heating blocks

To function correctly it is important to include in the purchase the controller unit for time and temperature RAT-2. The block should not be connected directly to the mains supply.



Models	Part No.	No. of positions	Ø tube mm	Height / Width / Depth (exterior) cm	Temperature °C	Power W	Weight Kg
MACRO	4000507	6	42	18 33 28	45 to 450	1500	18
MACRO	4000508	12	42	18 39 33	45 to 450	2100	25
MACRO	4000509	20	42	18 44 39	45 to 450	2500	31
MICRO	4001050	12	26	18 33 28	45 to 450	1500	16
MICRO	4001051	24	26	18 39 33	45 to 450	2100	22
MICRO	4001052	40	26	18 44 39	45 to 450	2500	27

### Process programmer for time / temperature RAT-2.

Part No. 4001538

#### Features

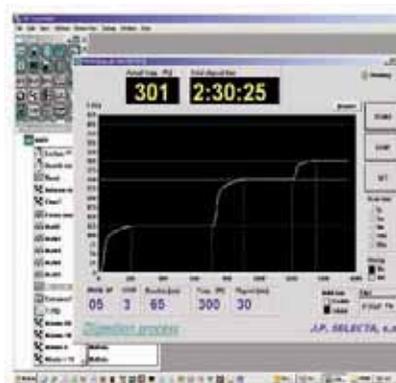
Temperature range from 45 °C to 450 °C.  
Memory for 20-4 steps programs.  
Maximum time per step: 600 minutes.  
Acoustic indication for digestion end of program.  
Two selectable temperature gradients: kjeldahl/D.Q.O.  
Temperature sense breakage alarm.  
Independent control of safety maximum temperature.  
Bidirectional RS-232 serial connection. For temperature registration and digestion program edition with the RAT connected to a PC.  
Software included.



Electronic controller RAT-2

#### Control Panel

The control panel and the RAT-2 display allow the creation and execution of the digestion program. During the digestion, it shows the block temperature, the elapsed time in the program step.



The software included makes easier the digestion program edition and the digester temperature register.

### Tube support rack.

Made of chemically treated no corrosive Dural, with handles and side panel that prevents heat loss.



Models	Part No.	No. of places	Height / Width / Depth (exterior) cm
MACRO	4005071	6	15 17.5 12.5
MACRO	4005081	12	15 23 18
MACRO	4005091	20	15 28.5 23.5
MICRO	4001053	12	15 17.5 12.5
MICRO	4001054	24	15 23 18
MICRO	4001055	40	15 28.5 23.5

### Fume extraction

Unit for collecting fumes supplied with a support rack. Made of borosilicate glass and stainless steel.



Models	Part No.	No. of places	Height / Width / Depth (exterior) cm
MACRO	4005072	6	15 18 12
MACRO	4005082	12	15 23 18
MACRO	4005092	20	15 29 23
MICRO	4001056	12	15 18 12
MICRO	4001057	24	15 23 18
MICRO	4001058	40	15 29 23



**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



**Water jet pump for vacuum extraction.** Made of PVC designed for the fume extraction of the 20 and 40 place models.  
Part No. 4000633



**Water Jet pump for vacuum extraction.** Metallic, suitable for the extraction of fumes for the 6, 12 and 24 place models.  
Part No. 7000293



## Steam distillation unit Kjeldahl “Pro-Nitro M”

DETERMINATION OF ORGANIC NITROGEN (KJELDAHL METHOD).  
AUTOMATIC NaOH DOSAGE AND TEMPORIZE STOP.

Steam distillation Kjeldahl unit.

Simple secure systematic analysis suitable for small to Medium throughput of samples.

### FEATURES

Steam distillation system.

Compact steam generator with safety over temperature thermostat and over pressure device.

Safety door, the system will not operate if the door is open.

“Tube in place” sensor: if the tube is not located, the dosing process of NaOH will not take place.

Universal adapter for digestion/distillation tubes MACRO (Ø 42 mm) and MICRO (Ø 26mm)

**Small footprint, saves bench top space:** The H<sub>2</sub>O and NaOH reservoirs are placed within the unit.

Stainless steel case with reinforced ABS plastic front.

Automatic distillate titration kit. (See accessories).

### SPECIFICATIONS

Measuring range: from 0.2 to 200 mg of Kjeldahl Nitrogen.

Programmable distillation time.

Nitrogen recovery >99.5%

Distillation speed: from 35-40ml/minute

Typical distillation time: from 7-10 minutes.

Water consumption rate: from 80-100 litres/Hr.

Steam generator water consumption: 2,5 Litres/ Hr.

Water reservoir for steam generator: 6 litres

NaOH reservoir: 2 Litres.

### ALARMS

Low water level for the steam generator.

Safety door open or no distillation/digestion tube in place.

Steam generator over temperature.

### AUTOMATED SEQUENCES

Open and closure of cooling water to the cooling coil.

Automatic load of NaOH once the distillation has started.

Select NaOH volume.

Stop at the end of the pre-set programmed time.

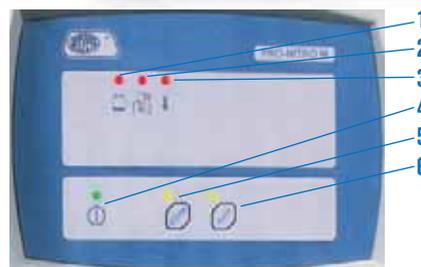
### ADDITIONAL REQUIREMENTS

To complete Kjeldahl Nitrogen analysis a digestion block is also required. (See Bloc Digest pages 246 and 247).

### MODEL

Part No.	Height / Width / Depth cm	Power W	Weight Kg
<b>4002627</b>	<b>75 50 50</b>	<b>1800</b>	<b>30</b>

Supplied with a MACRO Ø 42mm tube, set of reagent containers and tubing.



### CONTROL PANEL

1. Low water indicator.
2. Door open or no tube presence indicator.
3. Over temperature indicator.
4. Mains on indicator.
5. Push button and indicator start/stop distillation.
6. NaOH volume selection.

### ACCESSORIES



**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**



**Adapter kit** for automatic determinations. Vessel with location positions for pH electrode, stirrer and reagents and distillate sample.

Part No. **4001724**



## Steam distillation unit Kjeldahl Semi-Automatic "Pro-Nitro S"

DETERMINATION OF ORGANIC NITROGEN (KJELDAHL METHOD).  
AUTOMATIC BORACIC AND NaOH DOSAGE, SAMPLE DRAINAGE AND TEMPORIZED STOP.



Semi-automatic steam distillation Kjeldahl unit. Simple secure systematic analysis suitable for medium to large throughput of samples.

### FEATURES

Steam distillation system. Compact steam generator with safety over temperature thermostat and over pressure device. Safety door, the system will not operate if the door is open.

"Tube in place" sensor: if the tube is not located, the dosing process of NaOH will not take place.

Universal adapter for digestion/distillation tubes MACRO (Ø 42mm) and MICRO (Ø 26 mm).  
**Small footprint, saves bench top space:** The H<sub>2</sub>O, NaOH and H<sub>3</sub>BO<sub>3</sub> reservoirs are placed within the unit.

**Empty** Digestion/ Distillation tube system.

Stainless steel case with reinforced ABS plastic front.

Green LED 2 digit display.

Distillation program: (Add NaOH, Add Boric Acid, Distillation time, Empty tube.)

Automatic distillate titration kit. (See accessories).

### SPECIFICATIONS

Measuring range: from 0.2 to 200 mg Nitrogen.

Programmable distillation time.

Nitrogen recovery >99.5%

Distillation speed : from 35-40ml/minute

Typical distillation time: from 7-10 minutes.

Water consumption rate: from 80-100 litres/Hr.

Steam generator water consumption: 2.5 Litres/ Hr.

Water reservoir for steam generator: 6 litres

NaOH reservoir: 2 Litres.

Boric Acid reservoir: 2 Litres

### ALARMS

Low water level for the steam generator.

Safety door open or no distillation/digestion tube in place.

Steam generator over temperature.

### AUTOMATIC

Single push button to start the distillation cycle:

- Boric acid dosing
- Start distillation.
- NaOH dosing
- Stop Distillation (Programmed time transpired.)
- Acoustic indicator at the end of the cycle.

### ADDITIONAL REQUIREMENTS

To complete Kjeldahl Nitrogen analysis a digestion block is also required.

(See Bloc Digest pages 246 and 247).

### MODEL

Part No.	Height / Width / Depth cm	Power W	Weight Kg
<b>4002851</b>	<b>75 50 50</b>	<b>1800</b>	<b>32</b>

Supplied complete with a MACRO Ø 42 mm tube, set of connection tubes, set of reservoirs.

### ACCESSORIES



**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**



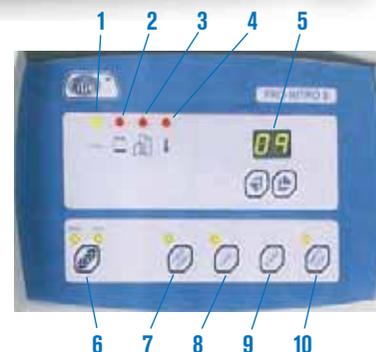
**Adapter kit** for automatic determinations. Vessel with location positions for pH electrode, stirrer and reagents and distillate sample.

Part No. **4001724**



### CONTROL PANEL

1. Illuminated indicator. Steam generator
2. Low water in the steam generator
3. Door open or no tube present indicator.
4. Over temperature indicator.
5. Push button and display to select parameters.
6. Mode push button, Manual or Automatic.
7. Push button, dose Boric Acid/ Push button START in automatic mode.
8. Dose NaOH push button.
9. Push button, start the distillation in manual mode.
10. Push Button, empty sample tube.





## 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 H<sub>2</sub>O, 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.

Titration reagent reservoir capacity: 2 Litres.

Evaluation precision: 1.5%

Minimum reagent dose 0.01ml.

### 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 246 and 247).



### MODEL

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

Supplied complete with a MACRO Ø 42 mm tube, set of connection tubes, set of reservoirs and 1 litre of Boric acid with indicator, 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 H<sub>2</sub>SO<sub>4</sub> from 0.05N or 0.25N adjusted to 0.001 Normal.



### CONTROL PANEL

1. Menu to configure the date, time and selectable parameters.
2. Print the analysis information using the optional printer 4120113, purchased as an accessory.
3. <<ESC>> to cancel changes and escape from the menu.
4. Increase values and navigation through the menu.
5. Decrease values and navigate through the menu.
6. <<ENTER>> to accept changes to parameters and navigation through the menu.
7. 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
  
```



### 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.**

### ACCESSORIES



#### Printer

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**



## Solvent recovery extractor for fats and oils “Det-gras N”

FOR THE DETERMINATION OF FATS BY SOXHLET METHOD.  
SAFETY PROTECTION IP65.

Equipment for the extraction of fats and soluble substances that will dissolve in solvents. Based on the Soxhlet methods by Randall, the DET-GRAS-N extracts fats (and or other substances) from the sample by dissolving them in a solvent. If compared to the classic standard soxhlet method, a time saving of between 30-70% can be obtained due to a two stage extraction process and high speed in obtaining high temperatures.

### APPLICATIONS

Practically all methods of classic soxhlet extraction can be substituted by the DET-GRAS N. Typical fat determinations are: in meat products, animal fodder, pre-prepared foods, fish etc. Also suitable for the extraction of soluble components in paper paste, textile fibres etc.

### FEATURES

Heating by protected electric heater, distributed throughout the radiator surface that provides homogeneous heating throughout the samples.  
Electrical safety according to IP65.  
Robust temperature control by a durable thermocouple.  
Safety over temperature device.  
Outer case made of solvents resistant epoxy coated steel.  
Extractions can be completed using glass or cellulose thimbles.  
Compatible with most common solvents: Petroleum ether, Diethyl ether, hexane, acetone acetonitrile etc.  
Supplied complete with 2 sets of seals, adapters for different solvent types.  
Typical extraction time (food fats) 50 minutes.  
Compatible with the hydrolysis unit HI-1427 part No 4001427 (see page 254).

### SPECIFICATIONS

Cellulose extraction thimbles  $\varnothing_{ext}$  26 x 60 mm.  
Reusable glass thimbles  $\varnothing_{ext}$  34 x 80 mm.  
Working temperature of 90 to 240 °C.  
Solvent recovery 60 to 80 %.  
Solvent volume (by sample): up to 50 ml.  
Program memories: 16.  
Extraction time <<boiling>>: from 0 to 99 minutes.  
Extraction time <<rinsing>>: from 0 to 99 minutes.  
Time to recuperate solvents: from 0 to 99 minutes.



### CONTROL PANEL

LCD display of 2 lines of 20 characters.  
Keypad with 4 push buttons to select temperature, time and programs.

### MODELS

Part No.	No. of places	Height / Width / Depth cm	Water consumption litres/minute	Power W	Weight Kg
4002841	2	70 45 40	1	200	19
4002842	6	70 75 40	2	600	25

Supplied with	model 6 places	model 2 places
Cellulose sample thimbles	25	25
Thimble rack	3	1
Support rack beakers	3	1
Aluminium tubes for thimble support	18	6
Extraction support for thimbles	18	6
Aluminium solvent beakers	18	6
Magnetic tongs for thimble manipulation	1	1
Tongs for manipulation of Aluminium beakers	1	1
Support rack	1	1
Transporting support handles	1	1
Butyl Joints	6	2
Vitron Joints	6	2



Accessories supplied with the 6 place model.



## Extractor for the determination of cellulose and fibre “Dosi-fiber”

### APPLICATIONS

Total Fibre (WEENDE, VAN SOEST or similar). Dietary fibre. Neutral detergent fibre. Acid detergent fibre. Other extraction processes which do not use acetic acid, acetic trichloric acid or nitric acid. Textile fibre. Wood and paper fibre.

### EQUIPMENT DESCRIPTION

Integral extraction and filtration.  
No sample transfer reduces the risk of sample loss, since the tubes, crucibles and filter are transferred with the samples in place.  
Excellent results due to reproducible operating conditions.  
Easy sample handling due to the special crucible support stand.  
Versatile and precise test procedure that allows the samples to be weighed at various stages in the extraction process.

### FEATURES

Rugged external case with a “RILSAN” protective coating. All equipment components; condenser, valves, heater, compressed air valves and controls are all protected within the main case. Infrared heating elements.

### CONTROL PANEL

Mains illuminated ON/OFF switch.  
Switch for compressed air pump.  
Heating element with electronic control.

### TECHNICAL DATA

Sample size: 0.5 to 3 g (Normally 1 g).  
Reproducibility: approximately  $\pm 1$  % for fibre level between 5-30 %.  
Measuring range: 0.1 to 100 %.  
Cooling water consumption: 1 litre/minute.

### EQUIPMENT

Comes complete with: crucible with a porosity P-2, Crucible support rack, heater lid and holder manipulator.



6 places extractor, part no. 4000623.

### ACCESSORIES

**Double hotplate** for reagents.  
Power consumption 1750 W.  
Part No. **4000634**  
**Beaker** for reagents.  
Part No. **1000635**



### MODELS

Part No.	No. of places	Height / Width / Depth (exterior) cm	Power W	Weight Kg
<b>4000599</b>	4	56 43 32	1000	19
<b>4000623</b>	6	56 57 32	1500	25

### SPARES

<b>Support rack</b> 4 crucibles. Part No. <b>4000600</b>	<b>Support rack</b> for 6 crucibles. Part No. <b>4000624</b>	<b>Crucibles</b> with a P - 2 porosity. Part No. <b>4000601</b>
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### EQUIPMENT FOR THE DETERMINATION OF TOTAL DIETARY FIBRE, ENZYMATIC METHOD

THE DETERMINATION OF TOTAL DIETARY FIBRE BY THE ENZYMATIC METHOD (AOAC, AACC) IS VERY DIFFERENT TO THE WEENDE AND THE DE VAN SOEST METHODS. THE EQUIPMENT FOR THIS ANALYSIS DEPENDS ON THE ENZYME KIT THAT YOU ARE GOING TO USE. ONCE THE TYPE OF ENZYME KIT IS SELECTED THE KIT INSTRUCTIONS WILL INDICATE THE NECESSARY EQUIPMENT TO COMPLETE THE ANALYSIS. THE COLD EXTRACTION UNIT EF-1425 PART NO 4001425 AND THE RECIPROCAL BATH PART NO 6032011 ARE FREQUENTLY USED (SEE PAGE 85).



## Cold extraction unit “EF-1425”

### DESCRIPTION

Specifically designed unit for cold extraction of up to 6 samples simultaneously, using acetone or other solvents. Complements the Dosi-Fiber for the analysis of crude fibre.

Components: 1 litre receptacle for solvent recovery, suction tube and 6 adapters to hold the filtration crucibles Part No. 4000601.

A pump or jet pump will be required to connect to the suction tube.

Comes complete with: blank stoppers in the case that not all of the 6 crucible places are used and a 1 litre solvent recovery vessel.

### FEATURES

Stainless steel AISI 304, extractor, modular construction, easy to use and fast removal for efficient cleaning. Support and crucible rack, made from hardened glass.

### MODEL

Part No.	Height / Width / Depth (exterior) cm	Weight Kg
<b>4001425</b>	45 20 34	3

### ACCESSORY

**Jet pump.**  
Part No. **7000293**





## Sample hydrolysis HI-1427

FOR THE HYDROLYSIS OF FAT SAMPLES.



### APPLICATIONS

Fat sample preparation equipment for extraction and the determination of fat content. Hydrolysis, filtration and washing of samples without manipulating or transferring. The hydrolysis of samples is required prior to determining the precise fat content of meat and dairy products. Efficient method that speeds up the extraction process.

### FUNCTION

Boil the sample with water and HCl 5N ("A"), filter and retain the fat in the extraction thimble and washing the remains of the fat and the acid ("B"). A classic hydrolysis using conventional techniques can produce errors due to transferring and the manipulation of the sample that results in sample loss. During the HCL process some of the acid evaporates, it is therefore necessary to extract the acid vapour.

### FEATURES

Metallic construction, exterior coated with a Rislan polyamide. Capacity for 6 glass tubes. Enclosed, quartz tube, heater system. Manual process and procedure from hydrolysis to filtration and wash without having to manipulate the sample.

### CONTROL PANEL

Illuminated ON/OFF mains switch  
Heater control from 0 to 100 %.

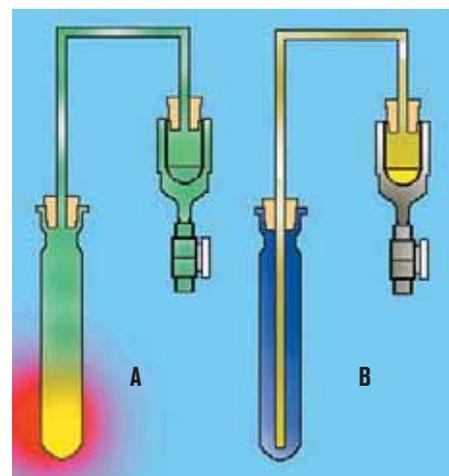
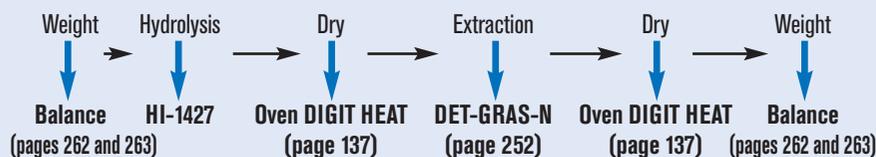


### MODEL

Part No.	No. of places	Height / Width / Depth (externo) cm	Power W	Water consumption litres/minute	Weight Kg
<b>4001427</b>	<b>6</b>	<b>85 64 40</b>	<b>1000</b>	<b>2</b>	<b>41</b>

Supplied with 6 tubes, 42 mm diameter x 300 mm long.

### EQUIPMENT REQUIRED FOR HYDROLYSIS AND THE % DETERMINATION OF FAT



Sample hydrolysis: In position "A", the suction acts like a vapour extractor.  
Filter and wash: In position "B", the suction acts like a filter.



## Oenological Distillation unit "DE-1626"

APPARATUS TO OBTAIN THE DISTILLATION OF ALCOHOL FROM ALCOHOLIC BEVERAGES IN ACCORDANCE WITH CEE NO. 2676/90 ( WINE ANALYSIS) AND CEE NO. 2870/2000 ( ANALYSIS OF SPIRITS.)



### APPLICATIONS

Degree of alcohol in wines, Degree of alcohol in spirits, Volatile acids and Sorbic acid.

### FEATURES

Vapour distillation.

Designed especially to obtain the distillation of wines and spirits to determine the alcohol grade by volume, volatile acid, ascorbic acid and other components.

Distillation volume up to 400 ml.

Auto stop at the end of the distillation.

Simple operation with minimum service.

Vapour generator protection system.

- Tube Ø 42 mm for volatile acid samples.

- Tube Ø 52 mm for volatile acid samples and 100 ml proof alcohol.

- Tube Ø 80 mm for samples of 200 ml for proof alcohol.

- 200 ml Matrix flask to collect distillate.

### TECHNICAL SPECIFICATIONS

Validated to the criteria of CEE No. 2676/90 and CEE No. 2870/2000  
Distillation speed: 30-40 ml/min (Recover of 200 ml of distillate in 5/6 minutes).

Condenser coolant water rate: 80-100 l/hr.

Generator water consumption: 1 and 1.25 ml for each ml of distillate.

Vapour generator power: 2400 W.

### CONTROL PANEL

Control Panel.

Electronic controller.

Mains switch.

START Push button.

STOP Push button.

ADD Push button.

By the use of the ADD button allows the distillate to set burette level, then, there is no need to fill up with water to a level of 200 ml.

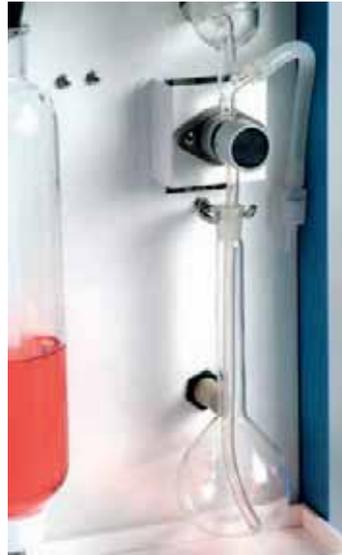
### VALIDATION

The oenological DE-1626 has been validated by the oenological laboratory INCAVI in Vilafranca del Penedés. This laboratory has completed analysis from the distillation unit DE-1626 for the determination of alcohol proof by volumetric analysis, following the criteria of CEE No 2676/90 and CEE 2870/2000. They have analysed samples of hydrated alcohol, different wines and spirits with a high alcohol content. The unit was successfully appraised by the laboratory.

### MODEL

Part No.	Height / Width / Depth cm	Power W	Weight Kg
<b>4001626</b>	<b>90 30 30</b>	<b>2400</b>	<b>20</b>

Supplied with tubes and flasks Ø 42, 52 and 80 mm and a 200 ml matrix flask.



*Automatic termination of final distillation at 200 ml of distillate. By using the ADD function small quantities of distillate can be added to accurately fill the matrix flask to the mark without having to add water to the distillation.*



### ACCESSORIES



Glass tube adapters.

Part No.	Dimensions
<b>4042300</b>	Ø 42 x 300 mm
<b>1001422</b>	Ø 52 x 300 mm
<b>1000646</b>	Ø 80 x 300 mm



Support rack for 6 tubes, made of stainless steel.

Part No.	Suitable tubes dimensions
<b>4000648</b>	Ø 42 mm
<b>4001473</b>	Ø 52 mm
<b>4001613</b>	Ø 80 mm



Matrix flask 200 ml.  
Part No. **1001636**

Alcoholmeters, graduations in 0.1 grade alcohol.

Part No.	Graduations
<b>1001629</b>	0 - 10
<b>1001630</b>	10 - 20
<b>1001631</b>	20 - 30
<b>1001632</b>	30 - 40
<b>1001633</b>	40 - 50
<b>1001634</b>	50 - 60
<b>1001635</b>	90 - 100



Alcoholmeters stand 6 places.  
Part No. **1000015**

**COMPLEMENTS FOR THE OENOLOGICAL DISTILLER "DE-1626"**

ALL BASIC WINE ANALYSIS WITH A SIMPLE MANUAL EQUIPMENT, COMPOSED OF: OENOLOGICAL ANALYSER PHOTOMETER "M-3000", MICRO-CENTRIFUGE "CENCOM-1" AND DRY-BLOCK THERMOSTAT "ENOBLOC".



## Oenological analyser photometer "M-3000"

SMALL BENCHTOP ANALYSER.  
FOR COLOR MEASUREMENT, FOLIN-CIOCALTEAU INDEX AND FOR ENZYMATIC ANALYSIS.



### APPLICATIONS

With the oenological application photometer, the following determinations can be performed:

1. Wine colouring intensity (absorbances addition at: 420, 520 and 620 nm.)
2. Folin index (polyphenols).
3. Grapes phenolic colour and maturity by means of *Cromoenos*® method.
4. Enzymatic analysis for grape juice, grape juice-wine and wine. Acids: acetic, malic, gluconic and lactic, glucose, fructose and glycerine.

### FEATURES

Wavelength range: from 340 to 750 nm, with interference filters with a 10 nm band pass.  
Manual filter selection (12 positions filter disc).  
Supplied with filters: 340, 420, 520, 620 and 750nm.  
Other optional filters possible.  
ABS, T% and concentration reading.  
ABS reading range: from -0.3 to 3.5 OD.  
T% reading range from 0 to 100%T.

Concentration range: from 0.001 to 9.999  
Photometric accuracy: 1%.  
Precision: ±1 %.  
Photometric stability: better than 0.004 A/h.  
Light source: halogen lamp 6V/12W.  
Cell holder for 10 mm. path length cuvettes.  
Internal calibration by software.

### CONTROL PANEL

Filter change knob.  
Numeric keypad and for functions.  
Alphanumeric display with interactive messages.  
RS-232 interface for connection to printer or computer.

### MODEL

Part No.	Height / Width / Depth mm	Power W	Weight Kg
4120004	11 18 28	35	3



### SPARE

Halogen lamp 6 V 12 W.  
Part No. 4313040

Note: A visible ultraviolet range spectrophotometer UV-2005 is needed for a total polyphenols index determination (absorbance 280 nm) and the *Cromoenos*® method exact and accurate measurement.  
Part no. 4120020. Page: 235

### ACCESSORIES

- Glass cuvettes 10 mm. path length. 2 units pack. Part No. 5100021
- Glass cuvettes 1 mm. path length. 2 units pack. Part No. 4120034
- Polystyrene cuvette, semi-micro, 10 mm. path length. 100 units box. Part No. 5100023
- Cuvettes adapter of 1 mm. Part No. 4120033



## Microcentrifuge "Cencom I"

FOR MICROTUBES OF 2,0 - 1,5 - 0,5 AND 0,2 ML.

### APPLICATIONS

To guarantee an excellent reproductibility in the enzymatic analysis, it is recommended to centrifuge at 14.500 rpm with 1,5 to 2 ml. tubes, to remove interferences (yeast, bacteria and colouring matter).  
The centrifuge is essential for the grape extract cleaning by means of *Cromoenos*® method.

### FEATURES

see page 108.

### CONTROL PANEL

Start switch.  
Push button Start/Stop.  
LCD display indicating time and speed.  
Time selector push button.  
Speed selector push button.  
Push button ▲ increase different parameters.  
Push button ▼ decrease different parameters.  
Push button motor drive rotation for quick acceleration Short/Spin.  
Push button open lid when cycle has ended.

### MODEL

Part No.	Tubes capacity	Height/ Width/ Depth (exterior) cm	Max. speed r.p.m.	R.c.f.(xg)	Power W	Time selected	Weight Kg
5059600	12	15 21 25	14500	14000	105	till 99' 99"	4



Comes complete with 12 adapters of 1,5-0,5 and 0,2ml.



## Metallic thermostat dry block "Enobloc"

### APPLICATIONS

To use the enzymatic reagents performing at full capacity, it is recommended to incorporate the thermostat dry-block incubator for tubes/cuvettes at a fixed temperature of 35 °C.  
Part No. 7001570  
Capacity: 15 cuvettes pathlength 10 mm, which can be macro or semi-micro of 1,5 ml.

### MODEL

Part No.	Height / Width / Depth (exterior) cm	Stability °C	Power W	Weight Kg
7001570	11 18 28	±0,5	10	2,4



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# APPARATUS FOR WATER ANALYSIS



## Thermo reactor for determining COD Chemical Oxygen Demand of waste water plants

STANDARD TO C.E.E. AND UNE 77-004.  
REFLUX METHOD.

### FEATURES

Composed of a Hot block for 6,12 or 20 samples, process programmer and lifting racks. Uniform heating throughout the block to all samples. Automatic temperature and time control during digestion.

C.O.D. unit comprises of:

- 1 metallic hot block.
- 1 Processor for temperature and time.
- 1 Support rack for tubes.
- 1 Support rack for condensers.
- C.O.D. tubes with an aperture of 29/32.
- Condensers for C.O.D.

### MODELS - EQUIPMENT DESCRIPTION

	Part No.	No. of places
DQQ. - 6	4000638	6
DQQ. - 12	4000639	12
DQQ. - 20	4000640	20



### INDIVIDUAL PARTS LIST AND SPARES

**Hot block.** This block cannot be used without the RAT controller of temperature and time.



Part No.	No. of places	Ø tube mm	Height / Width / Depth (exterior) cm	Temperature °C	Power W	Weight Kg
4000507	6	42	18 33 28	45 - 450	1500	18
4000508	12	42	18 39 33	45 - 450	2100	25
4000509	20	42	18 44 39	45 - 450	2500	31



**System programmer for temperature/time RAT-2.**  
Part No. 4001538

### Condenser tube support.

Part No.

- 4000643 6 places.
- 4000644 12 places.
- 4000645 20 places.



### Tube support rack.

Made of chemically treated dural sheet metal, with handles and removable panels that maintain the heat around the tubes and allow the user to examine the samples during the process.

Part No.

- 4005071 for C.O.D. 6 (block 4000507).
- 4005081 for C.O.D. 12 (block 4000508).
- 4005091 for C.O.D. 20 (block 4000509).



### Features

Display of time, temperature and program. Selectable temperature from 45 to 450 °C. Memory capacity: 10 programs of 5 stages of each program. Maximum time per stage: 600 minutes. Type K temperature probe. Visual and acoustic alarm at the end of the cycle. Alarm if the temperature probe fails. Switch at the back of the unit for C.O.D. analysis.

### Control Panel

- Mains switch.
- Temperature display.
- Push button to select temperature.
- Push button to increase value.
- Push button to start.
- Push button to stop.
- Push button to decrease value.
- Push button to select time.
- Display time and program number
- Push button to select program.

### Tubes for C.O.D.

Part No. 1000641



### Condenser tubes for C.O.D. process.

Part No. 1000642





## Laboratory flocculator "Flocumatic"

FOR THE DETERMINATION OF THE NECESSARY AGENTS REQUIRED FOR SEDIMENTATION.  
DIGITAL ELECTRONIC CONTROL OF SPEED AND TIME FUNCTIONS.

**Maximum torque per stirring unit is 40 Ncm. Maximum viscosity 30.000 mPas.**

### APPLICATIONS

Optimization of coagulant additives and poly-electrolytes for surface and residual water treatment.

Evaluation of the efficiency of an absorbent in toxic agents.

**Polyvalent. Without transmissions by belt. Due to its powerful torque it allows stirring and mixing high viscosity substances.**

### FEATURES

Stirring equipment for 4 or 6 places that accommodates beakers up to 1000 ml tall shape or 2000 ml short shape.

Stirring speed from 15 to 200 r.p.m.

Silent running.

**Adjustable timer from 1 to 999 minutes or continuous operation.**

Easily adjusted height over head stir, bars made of AISI 304 stainless steel are easily fixed in position.

Two vertical and horizontal adjustable illumination units can be placed in the unit. This adjustable accessory allows the light angle to be varied according to the samples being run. An original Selecta design. See accessories part numbers 3000834 and 3000915, 4 and 6 place models that obtain simultaneous front and back lighting. The main case of the unit is made of epoxy coated steel, with AISI 304 stainless steel supports with anti slip rubber feet.

### CONTROL PANEL

1. Digital display showing speed and time in minutes.
2. Indicator of the parameter displayed.
3. Push button selector of speed or time functions.
4. Push button to increase parameter value.
5. Push button to decrease parameter's value.
6. Push button to start-stop.



Flocculator "Flocumatic" with horizontal and vertical illumination (6 places).



Flocculator "Flocumatic" with horizontal illumination (4 places).

### MODELS

Part No.	No. of places	Speed r.p.m.	Height / Width / Depth (exterior) cm	Illumination power W	Power W	Weight Kg
<b>3000833</b>	4	15 - 200	52 70 23	40	160	24
<b>3000914</b>	6	15 - 200	52 99 23	50	170	36

### ACCESSORIES

**Illumination units**, simultaneous lighting horizontal and vertical.

Part No. Model part No.

**3000834** 3000833 4 places.

**3000915** 3000914 6 places.



## Portable flocculator "Jartest"

FOUR POSITIONS. WITH ILLUMINATION.

### FEATURES

Mains voltage or portable connection to a cigarette lighter within a car (12 V DC), for achieving analysis for a site chemical dose measurements of waste water treatment plants.

Head stirrers made of AISI 304 stainless steel with variable height.

Suitable for vessels up to 1 litre capacity.

### CONTROL PANEL

Illuminated power switch when the illumination element is on.

Speed selector of: 20, 40, 50, 100 and 200 r.p.m.

Timer from 0 to 30 minutes or infinity.

### MODEL

Part No.	Height / Width / Depth (exterior) cm	Power W	Power supply	Weight Kg
<b>5100117</b>	32 25 25	20	220-240 V / 50-60 Hz	4.8

### ACCESSORY.

**Carrying case.**

Part No. **5111005**





## Water distiller "Aquasel"

DISTILLATION CAPACITY: 4 AND 6 LITRES/HOUR.

**Made from stainless steel and glass, easy disassembly for cleaning and storage.**

### COMMON FEATURES

Easy to use, suitable for continuous distilled water requirements. Boiler unit and heater element made of AISI 304 stainless steel, with lid and condenser made of borosilicate glass. The glassware pressure seal connection is an original Selecta design. Safety system cuts off power to the heater element if there is not enough water. Distilled water produced is pyrogen free.

MODELS	Part No.	Distillation capacity l/h	Water consumption l/h	Conductivity at 20 °C	Ø / Height (ext.) cm	Power W	Weight Kg
Aquasel 4	4903004	4	50 to 60	3 µs/cm	18 43	2400	2.5
Aquasel 6	4903006	6	120 to 130	3 µs/cm	23 68	4800	4

Supplied complete with silicon seals.



## Distillation still "L-3"

DISTILLATION CAPACITY: 3 LITRE PER HOUR.

### FEATURES

Made entirely of borosilicate glass, with protective case support, designed for functionality, that permits easy access to the quartz heater elements.

Functions: automatic with continuous water production. Produces distilled water of a high purity, free of pyrogens and metal ions.

Equipped with quartz heater elements and protection device using a safety thermostat that is activated in the case of low water pressure to the condenser or boiler unit. The unit automatically re-activates when the water pressure is restored.

Suitable for wall mounting.

### MODEL

Part No.	Distillation capacity l/h	Water consumption l/h	Conductivity at 20 °C	Height / Width / Depth (exterior) cm	Power W	Weight Kg
4903000	3	60	3 µs/cm	34.5 56 19	2200	4.5



## Water distiller, "AC-L4" and "AC-L8"

DISTILLATION CAPACITY: 3.5 AND 8 LITRES/HOUR.

### FEATURES

Tank and heating element made from stainless steel.

External case made from epoxy covered steel.

Easily dismantled for cleaning and service. All seals made from silicon.

In the case of over temperature or low water supply, a safety thermostat cuts power to the heater.

Water supply tube Ø 10 to 11 mm.

Distilled water tube connection Ø 12 mm.

Voltage: 230 V / 50/60 Hz

### CONTROL PANEL

Illuminated power switch.

Safety switch thermostat with rearm system.

MODELS	Part No.	Distillation capacity l/h	Water consumption l/h	Conductivity at 20 °C	Height / Width / Depth cm	Power W	Weight Kg
AC-L4	5903005	4	30	2,5 µs/cm	55 25 23	3000	12
AC-L8	5903008	8	70	2,5 µs/cm	61 26 26	6000	14



OPTIC  
IYMEN<sup>®</sup>  
SYSTEM



## Water double distillation "L-4B"

DISTILLATION CAPACITY: 4 LITRES/HOUR.

### FEATURES

Made completely from borosilicate glass with protective case that has easy access to the heater elements and glass parts.

Automatic function and continuous production.

Produces high quality double distilled water free from pyrogen and metallic ions.

It functions through a dual distillation process:

The distilled water from the first stage is collected by the heater reservoir of the second stage, that starts the double distiller function when the water's level is optimum, thus providing double distilled process.

Complete with 4 quartz heater elements and three safety systems.

Over temperature protection with a safety thermostat is activated if there is insufficient cooling water. Reactivated automatically when the water supply is re-established.

Water flow stop if there is an electrical fault.

If it is required to store the distilled water and to prevent over filling, the system stops, switches off power and disconnects the water flow when is full.

Depending on the electrical installation, the user can configure the double distiller for the following power sources:

Voltage: 230 V / I, 50/60 Hz = 26.8 A

Voltage: 230 V / III, 50/60 Hz = 15.11 A

Voltage: 400 V / III+N, 50/60 Hz = 8.67 A



### MODEL

Part No.	Distillation capacity l/h	Water consumption l/min	Conductivity at 20 °C	Height/Width/ Depth cm	Power W	Weight Kg
<b>5903001</b>	4	1,3	1 µs/cm	46 66 50	6000	25

### SPARES

**Heater element**, made of quartz 1.5 KW (equipment has 4 units. The Part No. is only for 1 unit). Part No **5903002**

**Glass still**, borosilicate glass (front -1). Part No. **5903007**

**Glass still**, borosilicate glass (interior-2). Part No **5903009**

**Condenser**, borosilicate glass (the equipment comes with 2 condensers. Price provided is for 1 spare condenser). Part No. **5903015**



## Water distiller, specially for autoclaves "Dest-4"

DISTILLATION CAPACITY: 1.5 LITRES/HOUR. INTERNAL CAPACITY 4 LITRES.

### FEATURES

Case made from thermo resistant plastic. Internal stainless steel. Cooling by forced air through a condenser. Without glass heater elements, Easy to use. Safety cut out if over temperature due to insufficient water.

Supplied complete with a 4 litres plastic bottle and three dispenser tap with filter.

Note: for daily use it is recommended to change the filter every 3 months.

### MODEL

Part No.	Distillation capacity l/h	Conductivity µs/cm	Ø	Height cm	Power W	Weight Kg
<b>4001729</b>	1.5	5	29	39	750	3.5



**SPARE.** Dispensing filter tip. Part No. **4001730**



## Descaler "C-3"

### APPLICATIONS

Pre-treated water that contains large quantities of CaCO<sub>3</sub> (lime). For general laboratory use.

Recommended for use with distillation units where water hardness is above 25° french.

### TECHNICAL SPECIFICATIONS

Metal container of AISI 304 stainless steel with regeneration of salt by using a two way reverse valve system.

Resin capacity: 12 litres. Regeneration salt: 2 Kg.

Regeneration cycle: 1200 litres to 60° french / 4800 litres to 35° french.

Regeneration cycle for distillation of: 300 to 800 litres.

Maximum mains water pressure: 4.5 Kg/cm<sup>2</sup>.

Maximum supplied admissible hardness: 60° french.

Out put hardness: 1° french.

External measurement: 62 cm high x 19 cm Ø.

Weight: 20 Kg.

Part No. **0703052**



Comes complete with in and out 3/4" tubing.



## 50 Litre distilled water reservoir

### FEATURES

Recommended for the storage of distilled water. Made of high density polyethylene.

50 litre capacity, with handles and dispenser tap. 15cm Ø top lid with stopper.

Dimensions: 62 cm high x 38 cm Ø.

Part No. **0106006**

### ACCESSORY

**Water reservoir trolley.**

Robust steel trolley with epoxy coating.

Lockable wheels, Inner section for holding jars and carboys etc.

Fits containers 38 cm Ø.

Height 48 cm.

Part No **5903049**

