



# NUTRITIONAL AND WATER ANALYSIS APPARATUS

## EXTRACTION

Organic nitrogen determination by Kjeldahl “BLOC-DIGEST”  
 Steam distillation of protein, PRO-NITRO “M”  
 Steam distillation of protein semiautomatic, PRO-NITRO “S”  
 Kjeldahl distillation automatic PRO-NITRO “A”  
 Extractor for the determination of cellulose and fibre, “DOSI-FIBER”  
 Cold extraction unit, “EF-1425”  
 Solvent extractor unit for the determination of residues, oils and fats in nutritional and other materials DET-GRAS “N”  
 Sample Hydrolysis unit, “HI-1427”  
 Wine (Alcohol), distillation unit “DE 1626”

## WATER ANALYSIS

Chemical Oxygen Demand in residual water “C.O.D.”  
 Constant temperature refrigerated incubator cabinets, B.O.D. “MEDILOW S, M, L, LG”  
 Flocculator for water analysis, laboratory “FLOCUMATIC”  
 Flocculator for water analysis, portable “JARTEST”  
 De-mineraliser “LAB-ION”  
 Water Distillation unit, “AQUASEL”, “L-3” and “AC-L8”

**RECOMMENDED METHODS AND EQUIPMENT: PRO-NITRO M, S and A, DOSI-FIBER, EF-1425, HI-1427, DET-GRAS N, BLOC-DIGEST, DE-1626 and C.O.D.\***

ANALYSIS OF CEREAL AND DERIVATIVES	Reference	Pro-Nitro M,S and A	Dosi-Fiber	EF-1425	Det-Gras N	Bloc-Digest
Determination index for cellulose	Method Wladesco		YES	YES		
Insoluble fibre in food	Method Van Soest		YES	YES		
Crude Fibre	Method Weende & Wijkström		YES	YES		
Proteins	Method Kjeldahl	YES				YES
Soxhlet extraction for fat identification	Soxhlet Extraction				YES	
Crude Fat	Soxhlet Extraction				YES	
Arsenic	Determination A. A.					YES
Mercury	Determination A. A.					YES
ANALYSIS OF MILK AND DERIVATIVES	Reference	Pro-Nitro M,S and A	Dosi-Fiber	EF-1425	Det-Gras N	Bloc-Digest
Crude Fat	Soxhlet Extraction				YES	
Crude Protein	Method Kjeldahl	YES				YES
Casein	Method Kjeldahl through precipitation of casein	YES				YES
ANALYSIS OF ALCOHOLIC BEVERAGES	Reference	DE-1626	Dosi-Fiber	EF-1425	Det-Gras N	Bloc-Digest
Degree of alcohol	Method Volumetric	YES				
Volatile Acid	Method Volumetric	YES				
Iron	Method Volumetric					YES
ANALYSIS OF FODDER AND RAW MATERIAS	Reference	Pro-Nitro M,S and A	Dosi-Fiber	EF-1425	Det-Gras N	Bloc-Digest
Raw Cellulose	Method Weende & Wijkström		YES	YES		
Raw Protein	Method Kjeldahl	YES				YES
Raw Fat	Soxhlet estraction				YES	
Volatile base nitrates	Distillation Kjeldahl	YES				
Soluble Raw Fat en hydrochloric acid and Pipsin	Method Kjeldahl	YES				YES
Casein total	Method Kjeldahl in casein precipitate	YES				
Phosphorus	Method Photometric					YES
Hydrocyanic Acid	Distillation in Silver Nitrate	YES				
Pure zolidine	Soxhlet Extraction				YES	
ANALYSIS OF FRUIT BEVERAGES AND DERIVATIVES	Reference	Pro-Nitro M,S and A	Dosi-Fiber	DE-1626		Bloc-Digest
Total Nitrogen	Method Kjeldahl	YES				YES
Volatile Acids	Distillation measurement				YES	
Arsenic	Dichromate Determination					YES
ANALYSIS OF WATERS	Reference	Pro-Nitro M,S and A	Dosi-Fiber	D.Q.O./ECO-8/ECO16		Bloc-Digest
Total Nitrogen	Method Kjeldahl	YES				YES
Total Phosphorus	Method Photometric					YES
C.O.D.	Determination by Dichromate				YES	

\* Reference: Methods are official publications issued by the MAPA (Ministry of Agriculture, Fisheries and Nutrition) 1993.



## 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 programming 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 (<65dB)  
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.

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. Digester "Bloc Digest 20" requires 2 "Scrubber" units for a proper neutralization of fumes. Note: Pump with part number 4001612 has 2 suction inlets.

#### 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

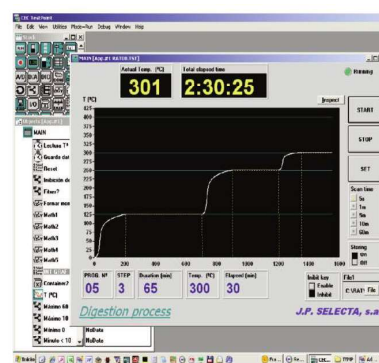
Temperature range from 45 °C to 450 °C.  
Memory for 20-4 steps programs.  
Maximum time per step: 600 minutes.  
Acoustic indication for digestion end of program.  
Two selectable temperature gradients: kjeldahl/D.Q.O.  
Temperature sense breakage alarm.  
Independent control of safety maximum temperature.  
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.



### 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	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

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**