

LABSOLUTIONS

FOOD&FEED LINE

NITROGEN/PROTEIN
DETERMINATION
DUMAS/COMBUSTION
METHOD
KJELDAHL
METHOD

SHELF LIFE
INVESTIGATION

FAT
EXTRACTION

RAW FIBER
EXTRACTION

DIETARY FIBER
EXTRACTION



KRACKELER
Scientific

NITROGEN/PROTEIN DETERMINATION

DUMAS METHOD

The Dumas method is used for the quantitative determination of nitrogen in chemical substances based on a technique first described by Jean-Baptiste Dumas, a French chemist. He introduced the combustion method for nitrogen analysis in 1831, but the original method was not accepted for routine analyses due to various difficulties (inaccurate results, lack of availability of the special gases and catalysts required for the analysis).

Since 1831 the original combustion method has been modified and automated to improve the technique.

An automated instrumental technique has been developed which is capable of rapidly measuring the total protein concentration of food samples. This method is beginning to compete with the Kjeldahl method as the standard method to determine the protein content of food samples as well as other types of sample.

NDA Series can be considered as the modern development of the original Dumas technique and thanks to the technology developed by VELP's internal R&D Department, the market now has an innovative solution for protein content determination by combustion of food and feed samples and environmental samples offering interesting results in terms of performance.

NDA Series is entirely controlled via PC through the **intuitive DUMASoft™** Software.

The several pre-installed methods and the numerous calibration curves that can be stored, increase the efficiency of the instrument. The software accepts weight values directly from the balance.

Data management appears clear and detailed, thanks to the final reports and the graph. The analyses can be recalled by a database and can be saved in different formats (according to LIMS) on the PC, exported as test reports or printed.

NDA Series offers a the **lowest detection limit** (0.001 mgN, with Helium) and an **excellent RSD%** (<0.5% with EDTA standard).

NDA 701 works with Helium as a carrier gas, whilst **NDA 702** can operate with Argon and Helium.

Moreover the NDA incorporates **TEMS™ technology** for major **savings in Time, Energy, Money and Space**, pursuing VELP's contribution to environmental protection.



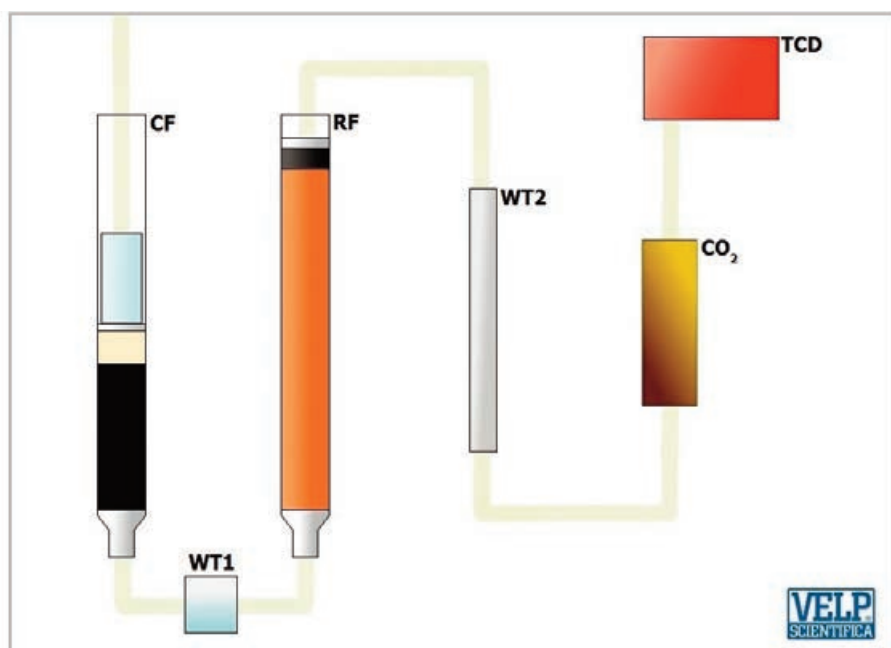
| GLP Good Laboratory Practice | | | |
|------------------------------|---|------|---|
| AOAC | • | AACC | • |
| ISO | • | IFFO | • |
| | | ASBC | |
| | | OIV | |

TIME SAVING:
UNPARALLELED
PRODUCTIVITY,
RESULTS IN ONLY
3-4 MINUTES

ENERGY SAVING:
EXCELLENT
ENGINEERING,
LOW
CONSUMPTION

MONEY SAVING:
LIMITED COST
PER ANALYSIS,
LESS GAS AND
REAGENT USED
(LOGAS™ AND
DRISTEP™)

SPACE SAVING:
JUST ONE SLIM
UNIT REQUIRED
FOR THE WHOLE
ANALYSIS



Dumas method starts with an initial combustion, obtaining elemental compounds as water, oxygen, carbon dioxide and nitrogen as well. NDA removes the water in two separate points with two different kinds of trap: the first is positioned after the combustion and is a physical trap (**DriStep™**), while the second is placed after the reduction and it is a chemical trap.

Between the two, the elemental substances pass through a reduction furnace, that eliminates oxygen and converts nitrogen oxide into elemental nitrogen.

The gases reach the auto-regenerative CO2 adsorbers and what remains is just nitrogen, that is detected by the **LoGas™** innovative Thermal Conductivity Detector (TCD) without requiring a reference gas.

NDA is a powerful Dumas Nitrogen Analyzer, able to hold up to 4 discs of 30 positions each.

Perform **precise analysis in a flash**, it is the best solution for **high productivity** and offers unique benefits, being **totally unsupervised**. This means that the NDA does not need to be controlled during its work and is able to **process samples 24/7**. Also under the **environmental aspect** it is a great solution: minimum wastes and residues are produced and the life of consumables is optimized by the software. Saving on consumables means **saving money**: with a consciousness lab managing, **the cost per analysis will be incredibly low**.

NDA 701

NDA 701 uses Helium as carrier gas to provide reliable N/protein determination.



NDA 702

NDA 702 is able to perform precise N/protein determination using either Helium or Argon as carrier gas. Particularly recommended for markets where Helium is scarce and its price is constantly increasing.



| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|------------------|-----------------|
| NDA 701 | 230 V / 50-60 Hz | 27907-F30800070 |

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|------------------|-----------------|
| NDA 702 | 230 V / 50-60 Hz | 27907-F30800080 |

GENERAL FEATURES AND PERFORMANCE

| | |
|------------------------|--|
| ANALYSIS TIME | 3/4 minutes |
| DETECTOR | Innovative autocalibrating TCD (no need for a reference gas) |
| AUTOSAMPLER CAPACITY | Up to 4 discs of 30 positions each |
| SAMPLE WEIGHT | Up to 1 gram |
| CARRIER GAS | NDA 701: Helium NDA 702: Helium or Argon |
| COMBUSTION TEMPERATURE | 1030 °C (1886 °F) |
| DETECTION LIMIT | NDA 701: 0.003 mg N (He) NDA 702: 0.001 mg N (He) or 0.01 mg N (Ar) |
| RECOVERY | > 99.5% |

| | |
|--------------------------|--|
| REPRODUCIBILITY (RSD) | < 0.5% for EDTA standards (9.57%N) |
| INTERFACE | USB and RS232 |
| HELIUM (He) / ARGON (Ar) | 2 bar - purity: 99.999% (grade 5.0) |
| OXYGEN (O ₂) | 2 bar - purity: 99.999% (grade 5.0) |
| POWER | 1400 W |
| DIMENSIONS (WxHxD) | 655x510x410 mm (H 690 mm with autosampler) 25.8x20.1x16.1 in (H 27.0 in with autosampler) |
| WEIGHT | 54 Kg (119 lb) |

Performance is ensured when NDA works with original VELP consumables.

NDA CONSUMABLES

VELP Scientifica offers a wide range of **superior quality consumables** for the day-to-day operations of your NDA Analyzer including high-quality quartz tubes, crucibles, tin foils, long-life and premium reagents and catalysts, calibration standards, o-rings, seals and fittings. At VELP Scientifica we manufacture most of the consumables we supply in order to ensure the most suitable solution for your NDA. VELP offers a great advantage compared to competitors, **instruments and consumables from a single source to optimize the performance** of your analyzer.

KIT FOR 1000, 2000 & 4000* ANALYSES

VELP Scientifica also offers consumables kits which contain all parts and reagents necessary for approximately 1000, 2000 and 4000* analyses: combustion and reduction tubes, reagents and instrument fittings.

Pre-packed solutions to save your time when ordering consumables for your analyzer!

* 1000, 2000 and 4000 are estimated values. The effective life of the kit depends on the quantity and the kind of sample.

ASH INSERTS

The ashes produced by the combustion are collected in a dedicated ash insert. VELP offers three different versions of ash insert: the "traditional" one is in quartz, yet a ceramic type is available with great porosity and higher resistance to elevated temperature and the third is metallic for the maximum resistance.

TIN FOILS

With their conical shape, our tin foils are ideal for the encapsulation of any kind of samples, including solid, semi-solid and liquid ones, and also other samples that are difficult to handle (e.g. powder, sticky, etc.). Resistant and completely nitrogen-free, they facilitate the combustion process!

VCOPPER™, SIMPLY REVOLUTIONARY

A simply revolutionary and patent-pending on the market for its resistance, finely developed along with universities. It provides a 3 times longer duration and increased comfort, as you are free from tedious work and time-consuming activities!



SUPPLIED WITH

CODE No

| | |
|--------------------------------|-----------------|
| Start-up kit for 1000 analyses | 27907-A00000193 |
| DUMASoft™ Software | 27907-40001504 |
| RS232 cable for balance | 27907-10003926 |
| Autosampler with disc 1 | 27907-40001065 |
| USB cable for PC, 5 mt | 27907-40001693 |

All the accessories for maintenance, connections, reactors and sample preparation are supplied with the instrument

OPTIONAL ACCESSORIES

CODE No

| | |
|-----------------------------|-----------------|
| Disc 2 for autosampler | 27907-A00000199 |
| Disc 3 for autosampler | 27907-A00000200 |
| Disc 4 for autosampler | 27907-A00000201 |
| Tin foil cup closing device | 27907-A00000217 |

CONSUMABLES

CODE No

| | |
|-------------------|-----------------|
| 1000 analyses kit | 27907-A00000194 |
| 2000 analyses kit | 27907-A00000270 |
| 4000 analyses kit | 27907-A00000271 |

| | |
|---|-----------------|
| Super-Absorbent Powder, 10g | 27907-A00000317 |
| Quartz wool, 50 g | 27907-A00000154 |
| Vcopper™ High Reduction Efficiency, 470 g | 27907-A00000240 |
| Copper oxide, 50 g | 27907-A00000157 |
| Velpcatalyst with inert layer, 36g | 27907-A00000320 |
| EDTA Certified, 100 gr | 27907-A00000149 |
| Rice flour, 30 g | 27907-A00000235 |
| Tin Foil Cups, 150 pcs | 27907-A00000153 |
| Tin Foil 50x50 mm, 450 pcs | 27907-A00000260 |
| Quartz reactor tube | 27907-A00000162 |
| Quartz ash insert | 27907-A00000161 |
| Metal reactor tube | 27907-A00000321 |
| Metallic ash collector | 27907-A00000322 |
| Cleaning kit for metallic ash collector | 27907-A00000353 |
| Ceramic ash collector | 27907-A00000198 |
| Anhydron, 454g | 27907-A00000225 |
| High temperature sealing grease | 27907-A00000236 |
| Pre-Packed Combustion Reactor | 27907-A00000158 |
| Pre-Packed Reduction Reactor | 27907-A00000226 |
| Mold for tin foil 50x50 mm | 27907-A00000262 |
| NDA IQ/OQ/PQ Manual | 27907-A00000192 |



NDA Series is completely controlled and operated by the **DUMASoft™**, offering all the most important info at a glance in one window!

1...BEFORE THE ANALYSIS

Simply position the capsule in the autosampler, enter sample name, type and weight and select the method and the calibration curve. Automatically, the software will set the analytical conditions according to the entered data. The dosing of gases is optimized by the software, in order to achieve complete combustion of the sample with minimum consumption. Create and save calibration curves using standards, pure test substances with a well-known nitrogen content. No need to create a new calibration curve every day. Recall it before starting the analysis. A good calibration curve requires 5-6 points. These should represent different standard quantities (in mg) to create a range (in mg of nitrogen) that will then contain the nitrogen content of the analyzed sample.

The more that the content of mg of nitrogen is centered in the range, the greater are the accuracy and precision of the analysis.

2...DURING THE ANALYSIS

In the main window the user can continuously check the instrument status, controlling the flow rate and the reactor temperatures on the right side of the page. Beneath, the user can also read suggestions about the maintenance, monitoring the number of analyses that can be performed before the next replacement. The real time graph shows the progress of the analysis, creating the peak as soon as the nitrogen starts reaching the Thermal Conductivity Detector (TCD).

3...AFTER THE ANALYSIS

Once the analysis is completed, the operator will find all the test information in the main window, with a real-time graph, info about the method and results in different formats (nitrogen mg, nitrogen % and protein %). All analysis data are stored into databases and can be exported in .xls, .txt and .csv format to PC or LIMS. The operator can also create test reports for a single test or multiple analyses for a better interpretation of the data. Results can be also recalculated using different calibration curves, without performing a new test, but only selecting the new curve. A particularly useful additional function can be the reintegration of the peak area. Results can be output to a printer.



LEAK SPOT IDENTIFICATION

Prior to analysis, particularly following replacement of reagents, it is possible to carry out a leak test to ensure that no time is wasted producing unusable results. Leak testing is fully automated, it even identifies in which zone a leak might be present. Indeed, it is possible to check specific areas only or the entire system:

- Test 1: autosampler, combustion reactor and water trap 1
- Test 2: Test 1 + reduction reactor
- Test 3: Test 2 + water trap 2 and CO₂ adsorbers
- Complete Test: on the whole system

Tests by zone are extremely useful when replacing parts and reagents; as the user is informed exactly where the leak is occurring. In addition, the time required for a test by zone is shorter compared to the complete test.

STAND-BY and HELIUM SAVING MODE

Right from the start of the analysis, the user can configure the NDA Series so that it switches automatically to standby mode or helium saving mode. Standby configuration involves reactor temperatures, carrier flow and valves, whilst helium saving mode affects only the carrier flow reducing the consumption of helium.

AUTOMATIC WEIGHING

The weight of samples prepared can be automatically transmitted by a balance: fast, easy and accurate data transfer. In fact, an interface with an electronic balance eliminates any errors in data transfer. NDA Series can be connected to several analytical balances with a resolution in grams of from 0.1 mg to 0.01 mg. Alternatively, the user can enter the sample weight manually in the relative database column.

UNLIMITED LIBRARY

The pre-installed methods and the possibility to create new programs or modify the existing ones allows the user to customize the instrument according to the most diverse requirements. Unlimited calibration curves can be created, saved and recalled at any time for an easy and fast recalculation of the result, without the need of repeating the analysis.

NITROGEN/PROTEIN DETERMINATION

KJELDAHL CONSUMABLES

KJELDAHL METHOD

Johan Kjeldahl was a Danish chemist who while studying the changes of protein content during the transformation of barley into malt process developed the method for determining nitrogen, which then took its name from him. Because of its high degree of precision, reproducibility and versatility, the Kjeldahl method is used today to determine the content of nitrogen and proteins according to the official methods (AOAC, EPA, DIN, ISO). The Kjeldahl method is the official method for determining nitrogen and protein contents in:

- Foods (raw materials and finished products)
- Animal feeds
- Soils, fertilizers, etc.
- Wastewater, sludge, etc.
- Lubricants, fuel oils, etc.

VELP Scientifica offers a complete package for Kjeldahl analysis, made up of a mineralization unit, aspiration and fume neutralization systems followed by distillation/titration units.

VELP digesters are suitable for a variety applications in food&feed, beverage (nitrogen, protein, Total Kjeldahl Nitrogen), environmental (COD, Total Kjeldahl Nitrogen), chemical and pharmaceutical (organic nitrogen) industries.

Choose the best solution according to your needs between DK and DKL Series!

GLP Good Laboratory Practice
AOAC • DIN • EPA • ISO

VELP Scientifica produces superior quality consumables to ensure accurate and reliable results from your analytical instrument at all times. We manufacture consumables for Kjeldahl analysis such as **catalyst & antifoaming** tablets and nitrogen-free weighing boats for digestion units and **boric acid** powder formula with indicators for colorimetric titration.

The addition of a suitable catalyst, along with high temperatures, have influence on the speed and the efficiency of mineralization. The **KjTabs™ catalyst tablets** are an accurately pre-dosed mixture of sulfate, to increase the boiling point of sulfuric acid plus a metal salt such as Copper (Cu), Selenium (Se) or Titanium (Ti) for time saving. Along with catalysts, we produce specific **antifoaming** KjTabs™ fundamental for the good outcome of the analyses.

The insertion of syrupy, viscose samples or powders is sometimes problematic at the time of the quantitative transfer into mineralization test tubes. The nitrogen-free **Weighing boats** of VELP ensure easy transfer operations lowering the potential risk of errors.

During the Kjeldahl distillation process, the ammonia content is condensed and collected in a boric acid solution to avoid loss of gaseous NH_3 . VELP unique **Vreceiver™** bags contain a certified formula composed of **Boric Acid** powder and a mixture of indicators mentioned by AOAC methods (Bromocresol green and Methyl red) allowing fast and standardized 1 litre receiving solution preparation for colorimetric titration.

CONSUMABLES

CODE No

| | |
|---|-----------------|
| KjTabs™ VCM 3,5g K_2SO_4 + 0,1g $\text{CuSO}_4 \times 5 \text{H}_2\text{O}$, 1000 pcs/box | 27907-A00000274 |
| KjTabs™ VKPC 4,5g K_2SO_4 + 0,5g $\text{CuSO}_4 \times 5 \text{H}_2\text{O}$, 1000 pcs/box | 27907-A00000275 |
| KjTabs™ VCT 5g K_2SO_4 + 0,15g $\text{CuSO}_4 \times 5 \text{H}_2\text{O}$ + 0,15g TiO_2 , 1000 pcs/box | 27907-A00000276 |
| KjTabs™ VST 3,5g K_2SO_4 + 3,5mg Se, 1000 pcs/box | 27907-A00000277 |
| KjTabs™ VTCT 3,5g K_2SO_4 + 0,105g $\text{CuSO}_4 \times 5 \text{H}_2\text{O}$ + 0,105g TiO_2 , 1000 pcs/box | 27907-A00000281 |
| KjTabs™ VW 4,875 g Na_2SO_4 + 0,075 g $\text{CuSO}_4 \times 5 \text{H}_2\text{O}$ + 0,050 g Se, 1000 pcs/box | 27907-A00000282 |
| KjTabs™ VS Antifoam 0,97 g Na_2SO_4 + 0,03g Silicone, 1000 pcs/box | 27907-A00000283 |
| Vreceiver™ TKN formula for 1l sol., 40g | 27907-A00000316 |
| Nitrogen-free weighing boats, 58x10x10 mm, 100 pcs/box | 27907-CM0486000 |
| Nitrogen-free weighing boats, 70x23x15 mm, 100 pcs/box | 27907-CM0486001 |



DK Series

DIGESTION UNITS



The **DK Series** is made of an aluminum heating block, that needs to be combined with a support system, sample rack (with heat shields), suction cap and test tubes.

The heating block offers an **excellent thermal homogeneity**, **precision and accuracy** and its temperature is controlled by a dedicated microprocessor. A graphic display shows up to 20 programs with 4 temperature ramps for each program, completely user-programmable. DK digestion units have a **very compact size** aimed to meet the most demanding laboratories needs in terms of space saving.

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|------------------|-----------------|
| DK 6 | 230 V / 50-60 Hz | 27907-F30100182 |
| DK 6 | 115 V / 50-60 Hz | 27907-F30110182 |
| DK 6/48 | 230 V / 50-60 Hz | 27907-F30100188 |
| DK 6/48 | 115 V / 50-60 Hz | 27907-F30110188 |
| DK 8 | 230 V / 50-60 Hz | 27907-F30100020 |
| DK 8 | 115 V / 50-60 Hz | 27907-F30110020 |
| DK 20 | 230 V / 50-60 Hz | 27907-F30100350 |
| DK 20/26 | 230 V / 50-60 Hz | 27907-F30100185 |
| DK 20/26 | 115 V / 50-60 Hz | 27907-F30110185 |
| DK 42/26 | 230 V / 50-60 Hz | 27907-F30100360 |

*The "Operating Accessories" indicated below are necessary for the correct functioning of the DK Series.



DK 20



DK 6



DK 8



DK 6/48



DK 20/26



DK 42/26

OPERATING ACCESSORIES

CODE No

| | |
|--|-----------------|
| DK 6 Sample rack with heat shields | 27907-A00001111 |
| DK 6 Suction cap | 27907-A00001096 |
| DK 6 Support system | 27907-A00001206 |
| DK 6/48 Sample rack with heat shields | 27907-A00001113 |
| DK 6/48 Suction cap | 27907-A00001101 |
| DK 6/48 Support system | 27907-A00001206 |
| DK 8 Sample rack with heat shields | 27907-A00000063 |
| DK 8 Suction cap | 27907-A00000065 |
| DK 8 Support system | 27907-A00000064 |
| DK 20/26 Sample rack with heat shields | 27907-A00001110 |
| DK 20/26 Suction cap | 27907-A00109626 |
| DK 20/26 Support system | 27907-A00001206 |
| DK 20 Sample rack | 27907-A00000168 |
| DK 20 Suction cap and drip tray | 27907-A00000169 |
| DK 20 Support system | 27907-A00000190 |
| DK 42/26 Sample rack | 27907-A00000180 |
| DK 42/26 Suction cap and drip tray | 27907-A00000179 |
| DK 42/26 Support system | 27907-A00000190 |
| DK 6 / DK 8 / DK 20 Test tubes Ø 42x300 mm, 250 ml, 3 pcs/box | 27907-A00000144 |
| DK 6/48 Test tube Ø 48x260 mm, 300 ml, 1 pcs/box | 27907-A00001088 |
| DK 20/26 / DK 42/26 Test tubes Ø 26x300 mm, 100 ml, 6 pcs/box | 27907-A00000146 |

OPTIONAL ACCESSORIES

CODE No

| | |
|--|-----------------|
| DK 6, 8, 20 Glass cap | 27907-A00000243 |
| DK 6 / DK 6/48 Drip tray | 27907-A00001200 |
| DK 6 / DK 6/48 / DK 20/26 Stand for sample rack | 27907-A00001097 |
| DK 8 Stand for sample rack | 27907-A00000067 |
| DK 20 / DK 42/26 Stainless steel stand for sample rack | 27907-A00000182 |
| Printer | 27907-A00001009 |
| Null modem connector for printer | 27907-A00000010 |
| Serial cable | 27907-A00000005 |
| IQ/OQ Manual for DK Series | 27907-A00000075 |

ACCESSORIES FOR COD ANALYSIS *

CODE No

| | |
|---|-----------------|
| COD Test tubes Ø 42x200 mm, 200 ml, 3 pcs/box | 27907-A00000145 |
| DK 6 COD Sample rack | 27907-A00001049 |
| DK 20 COD Sample rack | 27907-A00000237 |
| Air refrigerator with ground cone | 27907-A00001041 |
| Antisplash bell | 27907-A00001045 |
| PTFE sheat for 29/32 cone | 27907-A00001042 |

* with DK 6 and DK 20 only

DKL FULLY AUTOMATIC SERIES



The **fully auto DKL Series** is composed of an aluminum heating block offering **excellent temperature homogeneity, precision and accuracy**, an auto lift and an auto suction cap and is supplied as a complete package including test tubes, sample rack and drip tray.

High-tech but simple to use, a microprocessor controls the block temperature whilst an electronic auto-calibration system ensures **excellent reliability and repeatability of analysis**.

A practical interface with LCD graphic display allows access to all the data including the multi-language library and the 54 programs available, 24 of which are user-programmable. DKL digestion units are **extremely compact** with a narrow footprint for optimum use of space on the lab bench. Data can be printed or stored in a PC.



DKL 20



DKL 8



DKL 12



DKL 42/26

| INSTRUMENT | POWER SUPPLY | CODE No |
|-------------|------------------|-----------------|
| DKL 8 * | 230 V / 50-60 Hz | 27907-S30100200 |
| DKL 8 * | 115 V / 50-60 Hz | 27907-S30110200 |
| DKL 12 * | 230 V / 50-60 Hz | 27907-S30100190 |
| DKL 12 * | 115 V / 50-60 Hz | 27907-S30110190 |
| DKL 20 * | 230 V / 50-60 Hz | 27907-S30100210 |
| DKL 42/26 * | 230 V / 50-60 Hz | 27907-S30100180 |

* DKL Series comes including lift, suction cap, sample rack and test tubes

cNemkoUS certified

FULLY AUTOMATED AND UNSUPERVISED DIGESTION IN 3 STEPS



DKL Series incorporates VELP's revolutionary **TEMS™ technology** for unprecedented **savings in terms of Time, Energy - as much as 35%, Money and Space**.



TIME SAVING:
FROM AMBIENT
TO 420 °C IN
ONLY 22 MINUTES,
WITH FAST
PROGRAMMING

ENERGY SAVING:
35% REDUCTION
IN ENERGY
CONSUMPTION,
CUTTING CO₂
EMISSION

MONEY SAVING:
HUGE COST
REDUCTION FOR
EACH ANALYSIS

SPACE SAVING:
REDUCE
UNNECESSARY
USE OF SPACE

ACCESSORIES FOR COD ANALYSIS *

CODE No

| | |
|---|-----------------|
| COD Test tubes Ø 42x200 mm, 200 ml, 3 pcs/box | 27907-A00000145 |
| DKL 20 COD Sample rack | 27907-A00000237 |
| Air refrigerator with ground cone | 27907-A00001041 |
| Antisplash bell | 27907-A00001045 |
| PTFE sheat for 29/32 cone | 27907-A00001042 |

* DKL 20 only

SUPPLIED WITH

CODE No

| | |
|---|-----------------|
| DKL 8 Sample rack | 27907-A00000173 |
| DKL 8 Suction cap and drip tray | 27907-A00000175 |
| DKL 8 / DKL 12 / DKL 20 Test tube Ø 42x300 mm, 250 ml, 3 pcs/box | 27907-A00000144 |
| DKL 12 Sample rack | 27907-A00000172 |
| DKL 12 Suction cap and drip tray | 27907-A00000174 |
| DKL 20 Sample rack | 27907-A00000168 |
| DKL 20 Suction cap and drip tray | 27907-A00000169 |
| DKL 42/26 Sample rack | 27907-A00000180 |
| DKL 42/26 Suction cap and drip tray | 27907-A00000179 |
| DKL 42/26 Test tube Ø 26x300 mm, 100ml, 6 pcs/box | 27907-A00000146 |

OPTIONAL ACCESSORIES

CODE No

| | |
|---|-----------------|
| DKL 8, 12, 20 Glass cap | 27907-A00000243 |
| DKL 12 / DKL 20 Test tube Ø 50x300 mm, 400 ml | 27907-A00000185 |
| DKL 12 Sample rack for 400 ml test tubes | 27907-A00000181 |
| DKL 20 Sample rack for 400 ml test tubes | 27907-A00000246 |
| DKL 8 Stand for sample rack | 27907-A00000184 |
| DKL 12 Stand for sample rack | 27907-A00000183 |
| DKL 20 / DKL 42/26 Stand for sample rack | 27907-A00000182 |
| USB cable 1,8 mt, with filter | 27907-40002309 |
| IQ/OQ Manual for DKL Series | 27907-A00000186 |

| GENERAL FEATURES | CONSTRUCTION MATERIAL | DK SERIES Epoxy painted stainless steel structure | DKL FULLY AUTO SERIES Stainless steel with chemical resistant coating |
|----------------------|---|--|---|
| | NUMBER OF POSITIONS | DK 6: 6 pos. x 250 ml • DK 6/48: 6 pos. x 300 ml DK 8: 8 pos. x 250 ml • DK 20: 20 pos. x 250 ml DK 20/26: 20 pos. x 100 ml • DK 42/26: 42 pos. x 100 ml | DKL 8: 8 pos. x 250 ml • DKL 12: 12 pos. x 250/400 ml DKL 20: 20 pos. x 250 ml • DKL 42/26: 42 pos. x 100 ml |
| | SET TEMPERATURE | Digital readout in °C or °F | Digital readout in °C or °F or K |
| | TEMPERATURE RANGE | Ambient to 450 °C (842 °F) | Ambient to 450 °C (842 °F) |
| | COUNTDOWN | Digital readout | Digital readout |
| | LANGUAGES | UK, I, E, F, D, T | UK, I, E, F, RUS, CN + Additional Customizable (downloadable) |
| | INTERFACE | RS232 | USB |
| | POWER | DK 6: 1100 W • DK 6/48: 1100 W • DK 8: 1350 W DK 20: 2300 W • DK 20/26: 1100 W • DK 42/26: 2300 W | DKL 8: 1150 W • DKL 12: 1500 W DKL 20: 2300 W • DKL 42/26: 2300 W |
| | OVERALL DIMENSIONS (WxHxD) (including lift / support system) | DK 6: 295x462x549 mm (11.6x18x13.3 in) DK 6/48: 295x462x546 mm (11.6x18.2x13.3 in) DK 8: 235x566x587 mm (9.2x22.3x23.1 in) DK 20: 328x702x585 mm (12.9x27.6x23 in) DK 20/26: 295x462x546 mm (11.6x18x13.3 in) DK 42/26: 328x702x585mm (12.9x27.6x23 in) | DKL 8: 210x690x540 mm (8.3x27.2x21.3 in) DKL 12: 266x690x540 mm (10.5x27.2x21.3 in) DKL 20: 322x690x584 mm (12.7x27.2x23.0 in) DKL 42/26: 322x690x584 mm (12.7x27.2x23.0 in) |
| | OVERALL WEIGHT (including lift / support system) | DK 6: 16.2 kg (35.7 lb) • DK 6/48: 15.6 kg (34.4 lb) DK 8: 21.9 kg (48.3 lb) • DK 20: 20.0 kg (44.1 lb) DK 20/26: 18.8 kg (41.4 lb) • DK 42/26: 20.7 kg (45.6 lb) | DKL 8: 19.7 kg (43.5 lb) • DKL 12: 23.3 kg (51.4 lb) DKL 20: 30.8 kg (68.0 lb) • DKL 42/26: 33.5 kg (74.0 lb) |
| SAFETY / PERFORMANCE | PROGRAM LIBRARY | 20 user-programmable programs | 54 programs (30 standard + 24 user-programmable) |
| | SELECTABLE RAMPS | Up to 4 ramps per program | Up to 4 ramps per program |
| | DIGESTION TIME RANGE | From 1 to 999 minutes | From 1 to 999 minutes |
| | TIME SELECTION | 1 minute steps | 1 minute steps |
| | STABILITY AND PRECISION OF HEATING BLOCK TEMPERATURE | ± 0.5 °C | ± 0.5 °C |
| SAFETY | OVERTEMPERATURE | Thermostat | Thermostat |
| | DAMAGED TEMPERATURE PROBE | Automatic detection and alarm message | Automatic detection and alarm message |
| | LIFT MOVEMENT | - | Automatic |

SMS SCRUBBER



| | POWER SUPPLY | CODE No |
|-----|--------------|-----------------|
| SMS | - | 27907-F307C0199 |

SMS Scrubber is designed for the **neutralization of toxic and corrosive fumes**. Its working process is generally composed by 3 stages:

- Condensation
- Neutralization with acids and bases
- Absorption with activated carbon (optional accessories required)

Thanks to the elevated surface of contact between gas and liquid, SMS prevents hazardous emission into the laboratory and environment.



| | SMS |
|-----------------------|---|
| CONSTRUCTION MATERIAL | Epoxy painted stainless steel structure |
| POWER | - |
| DIMENSIONS (WxHxD) | 300x500x190 mm (11.8x19.7x7.5 in) |
| WEIGHT | 3.5 kg (7.7 lb) |

OPTIONAL ACCESSORIES

| | CODE No |
|---------------------------------------|-----------------|
| Pack of 10 refill of activated carbon | 27907-A00001164 |
| Filter for activated carbon | 27907-A00001165 |
| IQ/OQ manual SMS | 27907-A00000252 |

JP RECIRCULATING WATER PUMP



| | POWER SUPPLY | CODE No |
|----|---------------|-----------------|
| JP | 230 V / 50 HZ | 27907-F30620198 |
| JP | 230 V / 60 HZ | 27907-F30630198 |
| JP | 115 V / 60 HZ | 27907-F30640198 |

cNemkoUS certified

JP Recirculating Water Pump is the VELP solution for **aspirating toxic fumes**. JP provides a **considerable water saving** thanks to the principle of water recirculation in its tank. VELP Recirculating Water Pump is made with high-quality materials and equipped with special features. JP is **designed to last** and to offer **high performance** in terms of efficiency (up to 35 l/min flow rate).



| | JP |
|-----------------------|-----------------------------------|
| CONSTRUCTION MATERIAL | ABS |
| POWER | 160 W |
| DIMENSIONS (WxHxD) | 250x400x370 mm (9.8x15.7x14.6 in) |
| WEIGHT | 8.4 kg (18.5 lb) |

OPTIONAL ACCESSORIES

| | CODE No |
|-----------------|-----------------|
| IQ/OQ manual JP | 27907-A00000253 |

NITROGEN/PROTEIN DETERMINATION

UDK DISTILLATION UNITS

VELP Scientifica distillation units are the ideal solution for performing analyses concerning different applications such as determining ammoniacal nitrogen, protein nitrogen, (Kjeldahl or direct alkaline distillation), nitric nitrogen (after reduction), phenols, volatile acids, cyanides, alcohol content, sulphur dioxide, TVBN and Devarda nitrogen determination.

VELP Scientifica offers a wide choice with its 5-model series for performing efficient and reliable steam distillations, according to the different needs of the users.

All the units support the most advanced technology, consisting in a unique patented steam generator and an outstanding efficient patented titanium condenser that are wisely combined with a technopolymer splash head.

Designed with a strong and chemical-resistant structure made of technopolymer, UDK Series has been designed to last in time and to perform reliable analysis for many years.

Different safety features have been assembled on the units to improve the safety level of our users:

- safety lever avoids contact with soiled surfaces
- protective door with sensor shields test tube and prevents spills; completely closed
- service door + automatic electrical shutdown for extraordinary maintenance
- cooling water flow-rate detector activates low flow-rate warning signal
- test tube sensor ensures the presence of the test tube
- drip tray collects any drops

UDK Series supports different sizes of test tubes, from straight tubes (100, 250, 300, 400 ml and 1liter) to Kjeldahl flasks (500 ml).

UDK 139, 149, 159 and 169 software can be easily upgraded.

UDK Series also incorporates **TEMS™ technology** for major **savings in Time, Energy, Money and Space** pursuing VELP's contribution to environmental protection.

GLP GoodLaboratoryPractice
AOAC • DIN • EPA • ISO



TIME SAVING:
FAST AND FREQUENT ANALYSES; NO HEATING DELAY BETWEEN RUNS

ENERGY SAVING:
COOLING WATER CONSUMPTION STARTING FROM ONLY 0.5 L/MIN; EXCELLENT INSULATION OF INTERNAL PARTS

MONEY SAVING:
COST REDUCTION IS SUBSTANTIAL, IN LINE WITH REDUCED POWER CONSUMPTION

SPACE SAVING:
THE EXTREMELY COMPACT FOOTPRINT SAVES USEFUL LABORATORY BENCH SPACE

UDK 129 DISTILLATION UNIT

The **UDK 129** runs **automatically**, after setting **sodium hydroxide addition** and **distillation time** using the LCD display in order to get reliable and accurate results. The **high-precision pumps** ensure constant accurate dosing of reagents and the cooling water is automatically stopped during pauses, thus cutting down on its consumption. The new UDK 129 incorporates **the same high level of technology as the top of the range**, with the VELP **patented steam generator** that offers **high performance, safety** (no pressure inside) and is **maintenance-free**. Another unique VELP component is the **titanium condenser** offering **reduced water consumption**, ensuring that distillate temperature always remains below the threshold value. The unit works with a **technopolymer splash head** that ensures **durability** to protect your investment and requires **no maintenance**. The **technopolymer housing** ensures **high resistance** to chemicals and **long life**.



| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|------------------|-----------------|
| UDK 129 | 230 V / 50-60 Hz | 27907-F30200120 |
| UDK 129 | 115 V / 50-60 Hz | 27907-F30210120 |

cNemkoUS certified

The UDK 129 has numerous safety features in order to provide maximum protection for the user. Continuous monitoring indicates incorrect tube and handle positioning; the cooling water flow detector provides a **high level of safety**. With a novel design, a lever is used to displace the tube support enabling sample tubes to be inserted without any effort and clamped in place securely.

Technologically advanced, the UDK 129 includes many features that ensure efficient and reliable distillation, far beyond expectations of an ordinary entry level unit.

UDK 139 SEMI-AUTOMATIC DISTILLATION UNIT

The **UDK 139** runs **automatically**, after setting **distillation time**, **water and sodium hydroxide addition** and **steam generation output** level between 10 and 100% using the innovative **3.5" color touch screen**. The **high-precision pumps** ensure constant accurate dosing of reagents. Accessing the 10 customizable methods available in 6 different languages is simple and intuitive. The new UDK 139 incorporates a considerably **high level of technology**, with the VELP **patented steam generator** that offers **high performance**, **safety** (no pressure inside) and is **maintenance-free**. Another unique VELP component is the **titanium condenser** offering **reduced water consumption**, ensuring that distillate temperature always remains below the threshold value.



UDK 149 AUTOMATIC DISTILLATION UNIT WITH TITRATOR CONNECTION



The **UDK 149** operates **automatically**, after setting on the multi-function **3.5" color touch screen** **water, boric acid and sodium hydroxide addition**, **distillation time** and the **steam generation output** level between 10 and 100%. **Different automatic titrator models** can be connected to the UDK 149 for direct output of the final result and offering choice and **versatility** to the user. The **high-precision pumps** ensure constant accurate dosing of reagents. All the parameters concerning distillation and titration phase are easily programmable. **Simple, time-saving and intuitive** operation is assured by direct access to the 20 customizable methods available in 6 different languages (additional languages are also available). The UDK 149 offers **powerful archiving features**. The interfaces enable results to be downloaded to a pen drive or directly to a PC. The .xls format permits operators to use well-known software for extracting reports with maximum **flexibility**.



| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|--------------|---------|
|------------|--------------|---------|

| | | |
|---------|------------------|-----------------|
| UDK 139 | 230 V / 50-60 Hz | 27907-F30200130 |
|---------|------------------|-----------------|

cNemkoUS certified

The unit works with a **technopolymer splash head** ensures **durability** to protect your investment requires **no maintenance**. A **technopolymer housing** ensures **high resistance** to chemicals used during the operation. The UDK 139 is specially conceived to provide **absolute user protection**. Non-stop monitoring indicates incorrect tube and handle positioning; the cooling water flow detector and reagent level alarms provide a high level of safety. With a novel design, a lever is used to displace the tube support enabling sample tubes to be inserted without any effort and clamped in place securely. The instrument can be connected to a printer in order to print the data concerning the tests in progress and ensure traceability for the samples and system. The UDK 139 combines **excellent value-for-money** with **high reliability** and **advanced performance**.

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|--------------|---------|
|------------|--------------|---------|

| | | |
|---------|------------------|-----------------|
| UDK 149 | 230 V / 50-60 Hz | 27907-F30200140 |
|---------|------------------|-----------------|

cNemkoUS certified

The new UDK 149 incorporates the **latest technology**. The VELP **patented steam generator** is maintenance-free and offers **high performance** and an **outstanding level of safety** (no pressure inside). Also unique from VELP is the **titanium condenser** offering **reduced water consumption**, a high resistance to breakage and the guarantee that distillate temperature always remains below the safe threshold value to retain total nitrogen. A **technopolymer splash head** significantly increases the life expectancy and requires **no maintenance**. All chemical reagents used during the process are resisted by the **technopolymer housing**. **Full user protection** is top of the benefits of the UDK 149. Incorrect tube and handle positioning are continuous monitored and high safety levels are provided by the cooling water flow detector and reagent level. A range of sample tube sizes can be inserted without any effort using a lever to displace the tube support and clamping the tube in place securely because of the innovative design. The **versatility** of the UDK 149 is underlined by input from a titrator and data output to PC, pen drive and printer, in a common format, via USB, Ethernet and RS232 plus an **on-board archive** for sample data storage. Offering an upgrade pathway to combine distillation and titration, the UDK 149 will be instrument of choice for many laboratories.

UDK 159

AUTOMATIC DISTILLATION & TITRATION SYSTEM

The **UDK 159** runs **automatically**, after setting **distillation time** and **water, boric acid** and **sodium hydroxide addition**, the **steam generation output** from 10 to 100% using the innovative **6" color touch screen**. The **high-precision pumps and burette** ensure constant accurate dosing of reagents and with the **integrated colorimetric titrator (AOAC recommended)** you will have reliable results concerning your determinations. **Automatic titration vessel cleaning** provides significant advantages including **reducing maintenance to a minimum**. A 55-program library (31 predefined + 24 customizable) covers the needs of any laboratory and the reporting system is comprehensive.



The UDK 159 offers **powerful archiving features**. In compliance with GLP (Good Laboratory Practice), the interfaces enable results to be downloaded to a pen drive or directly to a PC. The .csv format permits operators to use well-known software for extracting reports with maximum flexibility. **Full understanding** and **ease of use** are ensured thanks to the choice of the preferred language. 6 languages are supplied as standard; others are available on request. The new UDK 159 incorporates a considerably **high-tech level**, with the VELP **patented steam generator** that offers **high performance, safety** (no pressure inside) and is **maintenance-free**. Another unique VELP component is the **titanium condenser**, offering **reduced water consumption**, ensuring that distillate temperature always remains below the threshold value. The unit works with a **technopolymer splash head** which increases the life span and requires **no maintenance**. A **technopolymer housing** provides **high chemical resistance** against all the reagents used during the process. The UDK 159 is specifically designed to provide **full protection of the user**. Continuous monitoring indicates incorrect tube and handle positioning; the cooling water flow detector and reagent level alarms provide a high level of safety. Thanks to an innovative system, sample tubes are inserted without any effort using a lever to displace the tube support and clamping the tube in place securely. **On-board archive** for data storage sample data, input from a balance and output to PC, pen drive and printer, in a common format, via Ethernet, USB and RS232 confirm the **versatility** of the UDK 159.

| INSTRUMENT | POWER SUPPLY | CODE No |
|--------------------|------------------|-----------------|
| UDK 159 | 230 V / 50-60 Hz | 27907-F30200150 |
| cNemkoUS certified | | |

MULTITASKING SOFTWARE

Improved communication leads to improved efficiency.

The display enables the operator to set all the parameters for a fully automatic control of the distillation and titration processes.

- Excellent usability
- Flexible, versatile and multi-language
- Intuitive data entry and programming
- Unlimited library with all the analyses
- Data export in .xls, .txt, .csv (according to LIMS) also on USB key
- Direct access to the archive from remote PC in real time without any download

UNPARALLELED PERFORMANCE WITH COLORIMETRIC TITRATION

VELP Scientifica state-of-the-art Kjeldahl solution includes **on-board colorimetric titration system** for outstanding performance. Based on precise chemical reaction, this technique offers superior reliability, being the preferred method used and suggested by the main International bodies and organization (AOAC just to name one). With VELP Scientifica solutions, the benefits go even further: **shorter analysis time, maintenance-free, automatic vessel cleaning** and **no need for frequent calibration** make the colorimetric titration the most appreciated on the market.



UDK 169 & AUTOKJEL AUTOMATIC KJELDAHL ANALYZER WITH AUTOSAMPLER



VELP response for maximum productivity is the completely automated UDK 169 combined with the **AutoKjel**, for fully unsupervised operation.

The **UDK 169** provides the same **premium technology and advanced performance** of UDK 159, including the colorimetric titration, but in addition it offers the possibility to be connected with AutoKjel autosampler.

The **AutoKjel** ensures high throughput and synchronizes all the procedures for achieving **accurate and reliable nitrogen and protein determination, unattended**. Tubes are directly transferred into the UDK 169 for further processing, preventing any sample transfer. Once the analysis is completed, the AutoKjel lowers the empty tube and automatically moves the next one in the correct position.

Two different sizes of test tubes are supported, with a standard rack of **24 positions (250 ml tubes)** or an optional one for 21 samples in 400 ml tubes, improving the **flexibility**.

Robust and reliable, AutoKjel comes complete with all the accessories required for the connection to UDK 169 and dedicated tanks for NaOH, H₂O, H₃BO₃ and waste.

The system has been designed for the highest productivity available when using Kjeldahl method, significantly **reducing operator time and efforts** as just the sample loading into the AutoKjel is required.

| INSTRUMENT | POWER SUPPLY | CODE No |
|-----------------------|------------------|-----------------|
| UDK 169 | 230 V / 50-60 Hz | 27907-F30200160 |
| AutoKjel | 230 V / 50-60 Hz | 27907-F30200430 |
| UDK 169 with AutoKjel | 230 V / 50-60 Hz | 27907-S30200160 |

cNemkoUS certified

21-position carousel,
400 ml tubes (optional)

24-position carousel,
250 ml tubes (standard)



STEAM GENERATOR

PATENTED

TITANIUM CONDENSER

PATENTED

- Safe Working Conditions

A thermostat ensures the correct functioning of the steam generator, a safety thermostat eliminates risks for the operator

- Non-Pressurized

No chance of leaks occurring even after an intensive use

- Extremely Reliable

High level of precision and accuracy ensures correct results

- Deionized Water

Deionized water prevents misleading results and limescale

- Efficient Thermal Exchange

Distillate temperature always below the threshold value

- Limited Water Consumption

From only 0.5 l/min at 15 °C (1 l/min. at 30 °C)

- No Nitrogen Loss, Precise Results

Cost reduction thanks to high performance, minimal consumption and no external chiller



PERFORMANCE

| | UDK 129 | UDK 139 | UDK 149 | UDK 159 | UDK 169 |
|---|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|
| ANALYSIS TIME | 5 min (for 100 ml) | 4 min (for 100 ml) | 3 min (for 100 ml) | from 4 min (titration included) | from 4 min (titration included) |
| REPRODUCIBILITY (RSD) | ≤ 1% | ≤ 1% | ≤ 1% | ≤ 1% | ≤ 1% |
| RECOVERY (at nitrogen level between 1-200 mg) | ≥ 99.5% | ≥ 99.5% | ≥ 99.5% | ≥ 99.5% | ≥ 99.5% |
| DETECTION LIMIT | ≥ 0.1 mg N | ≥ 0.1 mg N | ≥ 0.1 mg N | ≥ 0.1 mg N | ≥ 0.1 mg N |
| AUTOMATIC SODIUM HYDROXIDE ADDITION | • | • | • | • | • |
| AUTOMATIC DILUTION WATER ADDITION | | • | • | • | • |
| AUTOMATIC BORIC ACID ADDITION | | | • | • | • |
| SELECTABLE DISTILLATION TIME | • | • | • | not necessary with titration | not necessary with titration |
| DISTILLATION RESIDUES REMOVAL | | • | • | • | • |
| STEAM FLOW REGULATION (10-100%) | | • | • | • | • |
| DELAY TIME (DEVARDA ALLOY ANALYSIS) | • | • | • | • | • |
| DISTILLATION IN SERIES | | | • | • | • |
| LIMITED WATER CONSUMPTION | • | • | • | • | • |
| DISPLAY | LCD | 3.5" touch screen | 3.5" touch screen | 6" touch screen | 6" touch screen |
| PROGRAMS | 1 | 10 | 20 | 55 | 55 |
| LANGUAGE SELECTION | | • | • | • | • |
| ARCHIVE (on-board data storage) | | | • | • | • |
| PASSWORD (user/super user) | | | • | • | • |

TITRATION

| | | | | | |
|------------------------------------|--|--|---|---|---|
| TITRATION RESIDUES REMOVAL | | | • | • | • |
| AUTOMATIC TITRATION VESSEL WASHING | | | • | • | • |

CONNECTION

| | | | | | |
|-------------------------------|--|---|---|---|---|
| MOUSE | | • | • | • | • |
| PRINTER | | • | • | • | • |
| PC (for data storage) | | | • | • | • |
| PEN DRIVE (for data transfer) | | | • | • | • |
| BALANCE | | | | • | • |
| AUTOSAMPLER | | | | | • |

GENERAL
FEATURES

| | | | | | |
|---------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| OVERALL DIMENSIONS IN MM (in) (WxHxD) | 385x780x416 (15.2x30.7x16.4) | 385x780x416 (15.2x30.7x16.4) | 385x780x416 (15.2x30.7x16.4) | 385x780x416 (15.2x30.7x16.4) | 385x780x416 (15.2x30.7x16.4) |
| OVERALL WEIGHT IN KG (lb) | 24 (52.9) | 26 (57.3) | 27 (59.5) | 31 (68.3) | 31 (68.3) |
| POWER SUPPLY | 230 V / 115 V | 230 V | 230 V | 230 V | 230 V |
| POWER | 2100 W / 1700 W | 2100 W | 2100 W | 2200 W | 2200 W |

UDK ACCESSORIES

SUPPLIED WITH

CODE No

| | |
|--|-----------------|
| Test tube Ø 42x300 mm, 250 ml | 27907-A00001080 |
| Collecting flask, 250 ml | 27907-10001106 |
| Pincer for test tubes | 27907-10000247 |
| Touch pen (for UDK 139, 149, 159, 169) | 27907-10004936 |

OPTIONAL ACCESSORIES

CODE No

| | |
|---|-----------------|
| Test tube Ø 26x300 mm, 100 ml, 6 pcs/box | 27907-A00000146 |
| Test tube Ø 42x300 mm, 250 ml, 3 pcs/box | 27907-A00000144 |
| Test tube Ø 48x260 mm, 300 ml | 27907-A00001088 |
| Test tube Ø 50x300 mm, 400 ml | 27907-A00000185 |
| Test tube Ø 80x300 mm, 1 liter | 27907-A00001083 |
| Spacer for test tube Ø 48x260 mm | 27907-A00000206 |
| Test tube connection Ø 26 mm, Ø 48 mm and 500 ml Kjeldahl balloon | 27907-A00000043 |
| Kjeldahl balloon, 500ml | 27907-A00000082 |
| Alcoholic strenght kit | 27907-A00000285 |
| IQ/OQ/PQ UDK 129 Manual | 27907-A00000205 |

| | |
|---|-----------------|
| IQ/OQ/PQ UDK 139 Manual | 27907-A00000204 |
| IQ/OQ/PQ UDK 149 Manual | 27907-A00000203 |
| IQ/OQ/PQ UDK 159 Manual | 27907-A00000202 |
| IQ/OQ/PQ UDK 169 Manual | 27907-A00000254 |
| IQ/OQ AutoKiel Manual | 27907-A00000256 |
| Waterproof mouse (for UDK 139, 149, 159, 169) | 27907-A00000215 |
| Titration Titroline Easy K for UDK 149 | 27907-R30800194 |
| Acid resistant pump kit 230 V (all UDK Series) | 27907-A00000220 |
| Acid resistant pump kit 115 V (for UDK 129) | 27907-A00000259 |
| AutoKiel carousel for 21x400 ml test tubes | 27907-A00000247 |
| NaOH tank with caps (all UDK Series) | 27907-A00000265 |
| H ₂ O tank with caps (all UDK Series) | 27907-A00000266 |
| H ₃ BO ₃ tank with caps (for UDK 149,159,169) | 27907-A00000264 |
| Residues tank with caps (for UDK 139,149,159,169) | 27907-A00000267 |
| Glass Splash Head Kit (for UDK 129) | 27907-A00000238 |
| Glass Splash Head Kit (for UDK 139, 149, 159, 169) | 27907-A00000238 |
| Guide for Autokjel | 27907-A00000255 |
| Serial Cable (for UDK 159, 169) | 27907-A00000005 |
| Adapter USB – RS232 (for UDK 139, 149, 159, 169) | 27907-A00000195 |
| Printer (for UDK 139, 149, 159, 169) | 27907-A00001009 |

SHELF LIFE INVESTIGATION

SHELF LIFE STUDIES

The **Oxitest** is an innovative solution able to provide high added-value information concerning fat oxidation processes in foods, oils and fats.

The **Oxitest works directly on the whole sample** without the need for preliminary fat separation, and is suitable for the determination of the quality and the state of preservation of the food sample.

An **extremely simple** and **intuitive** instrument equipped with two separate titanium chambers in order to analyze the same sample in duplicate or different samples at the same time and under the same conditions.

The stability of the sample is evaluated by accelerating the oxidation process using high temperatures (from 20 to 110 °C) and a pre-determined oxygen pressure.

Oxygen is consumed during fat oxidation and it is this decrease in oxygen pressure that enables us to obtain useful information concerning the food sample.

The **intuitive software** controls the entire process in a **user friendly** way and the operator can record data in a database, compare tests, export the data to an Excel file, filter and order the data quickly and simply.

The Oxitest method is an **AOCS Official Method Cd 12c-16**: "Accelerated Oxidation test for the Determination of the Oxidation Stability of Foods, Oils and Fats Using the Oxitest Oxidation Test Reactor"

AOCS Official Method Cd 12c-16

OXITEST OXIDATION TEST REACTOR



The Oxitest is the versatile VELP solution suitable for a wide range of applications, including:

- Prediction of the oxidation stability during shelf-life studies, by analyzing the product at defined time intervals and building an experimental curve;
- Evaluation of the adequacy of storage conditions;
- Evaluation of the best packaging solution;
- Comparison of the oxidation stability of different formulas for food preparations;
- Evaluation of the oxidative stability of vegetable oils of different botanical origin;
- Evaluation of the effectiveness of antioxidants.

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|------------------|-----------------|
| OXITEST | 230 V / 50-60 Hz | 27907-F30900248 |



| SUPPLIED WITH | CODE No |
|---------------------------------|-----------------|
| OXISoft™ OXITEST Software | 27907-10002948 |
| USB cable | 27907-10003134 |
| Sample holder | 27907-10001985* |
| Spacer | 27907-10001984* |
| High temperature sealing grease | 27907-A00000236 |

*the unit comes with 6 sample holders and 4 spacers

| OPTIONAL ACCESSORIES | CODE No |
|----------------------|-----------------|
| IQ/OQ Manual OXITEST | 27907-A00000242 |

GENERAL FEATURES AND PERFORMANCE

| | |
|------------------------------|---|
| CONSTRUCTION MATERIAL | Epoxy painted stainless steel structure and anodized aluminum |
| NUMBER OF OXIDATION CHAMBERS | 2 |
| CAPACITY OF SINGLE CHAMBER | Up to 100 ml |
| TEMPERATURE RANGE | Ambient to 110 °C |
| PRESSURE RANGE | 0 - 8 bar |
| OVERPRESSURE | Safety valve |
| POWER | 900 W |
| DIMENSIONS (WxHxD) | 365x190x485 mm (14.6x7.6x19.4 in) |
| WEIGHT | 16.5 Kg (36.3 lb) |



OXITEST is completely controlled and operated by the **OXISoft™**, offering all the most important info at a glance in one window!

1...BEFORE THE ANALYSIS

The samples are weighed in titanium sample holders and placed into the two independent titanium chambers, where temperature and oxygen pressure are automatically adjusted to by the software according to the entered data.

2...DURING THE ANALYSIS

In the main window the user can continuously check the instrument status, pressure and the temperature on the right side of the page. Up to 4 OXITEST can be managed by the same software at the same time, for the maximum productivity. The real time graph constantly shows the progress of the analysis.

3...AFTER THE ANALYSIS

Once the analysis is completed, the operator will find all the test information in the main window, with graph, info about the method and results. All analysis data are stored into databases and can be exported in .xls, .txt and .csv format to PC or LIMS.

The operator can also create test reports for a single test or report a comparison between multiple analyses for a better interpretation of the data.

All the results and reports can be output to a printer or saved for GLP compliance.

Results can be output to a printer.

REPEATABILITY TEST



a series of tests run on the same sample or standard to verify its IP period, to calculate accuracy and repeatability of the data

FRESHNESS TEST



to verify the quality of different lots, and compare them

FORMULAS COMPARISON



what is required to identify the most stable formula of a finished product, under the same conditions

PACKAGING COMPARISON



particularly useful for testing which packaging maintains the product in the freshest condition

IP DURING AGEING



same samples are tested at different times to fix the linear equation and the decreasing of the Induction Period with the going by of the time

ESTIMATED SHELF LIFE TEST



it shows a prediction of the oxidation stability during the shelf life

RANDALL HOT SOLVENT EXTRACTION

Solvent extraction is used to determine the quantity of various components (e.g. Fat) contained in agricultural, industrial or environmental samples.

Soxhlet extraction, is one of the most widely used analytical technique which performs extraction with cold solvent. Adaptation of Soxhlet have been introduced over time, reducing extraction time by increasing the temperature of the solvent as with the Randall technique.

The solvent extractors of VELP Scientifica operate a solid-liquid extraction process that removes soluble components from solid samples using a liquid solvent according to the Randall technique, offering significant benefits in term of time saving and solvent recovery.

This method is performed in 3 main steps: Immersion, Washing and Recovery although other two intermediate steps, Removing and Cooling, can be added (with the SER 158) in order to maximize the performance.

Hot solvent extraction works in accordance with national and international standards and can be used in various industries and analytical fields.

| APPLICATIONS: | MAIN INDUSTRIES: |
|---|--------------------------------------|
| FAT DETERMINATION (CRUDE AND TOTAL) | FOOD AND FEED |
| OIL/FAT CONTENT DETERMINATION | ENVIRONMENTAL, TEXTILE, PULP & PAPER |
| SAMPLE PREPARATION FOR THE EXTRACTION OF POLLUTANTS AND CONTAMINATED ELEMENTS | PLASTIC & PETROLEUM, ENVIRONMENTAL |

GLP Good Laboratory Practice
AOAC • ISO • EPA • APHA • UNI

THE SER SERIES

The fully automatic SER 158 and the semi-automatic SER 148 guarantee safe operations and low solvent consumption for all sort of hot solvent extractions. The VELP extractors come with 3 or 6 positions.

The automatic and semi-automatic SER are fully equipped, versatile and with a complete range of accessories providing total flexibility in all fields of application.

Solvent extraction with the SER series can be performed not only for Fat extraction (crude and total) in food and non-food samples but also for sample preparation for additional test such as Hydrocarbons from soil, Oil in sludge, Paraffin in wood chips, and many more.

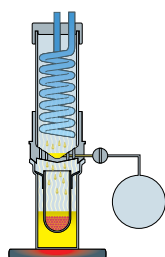


SOXHLET TECHNIQUE

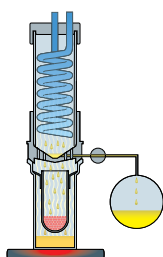


The solubilization of extractable components is performed by a cold solvent dropping from a reflux condenser. Consequently a complete extraction lasts many hours.

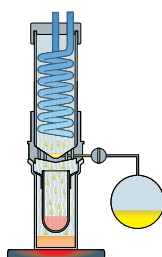
SER 158 FULLY AUTOMATIC EXTRACTION PROCESS



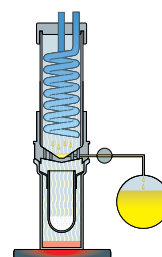
IMMERSION
The sample is immersed into boiling solvent



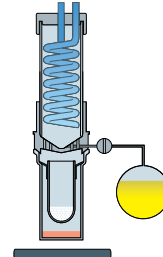
REMOVING*
Solvent volume is reduced



WASHING
The solvent flows through the thimble



RECOVERY
Solvent is recovered



COOLING*
Prevention of extracted matter overheating

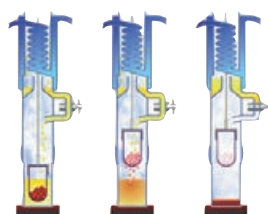
*Performed only with the SER 158.

SER 148 SOLVENT EXTRACTOR

The **SER 148/3** and **SER 148/6** can be used to separate a substance or a group of elements (e.g. fat) from solid and semi-solid samples according to the **Randall technique** (consisting of Immersion, Washing and solvent Recovery).

The SER 148 Series is a semi-automatic solution with no compromises on **operator safety (IP55)** and **solvent consumption** also guaranteeing a **limited cost per analysis**.

Robust design and large install base make the SER 148 Series the reliable choice for any laboratory aiming at reducing the time per analysis compared to the traditional Soxhlet method. As for the automatic version, the main field of application is the determination of the content of soluble products such as fats, detergents, plasticizers and pesticides in food, animal feeds, detergents, rubber and plastic formulas, pharmaceutical products, soil.



RANDALL TECHNIQUE

The first phase of extraction is performed by immersing a sample - containing thimble in boiling solvent followed by a washing with cold refluxing solvent. The fast solubilization achieved by the hot solvent results in a sharp reduction of extraction time.

CONSUMABLES

CODE No

Extraction thimbles 33x80 mm, 25 pcs/box

27907-A00000295



SUPPLIED WITH

CODE No

| | |
|--------------------------------------|------------------------|
| Extraction Cups SER 148/3 | 27907-A00001141 |
| Extraction Cups SER 148/6 | 27907-A00000142 |
| Extraction Thimbles 33X80, 25pcs/box | 27907-A00000295 |
| Inlet Tube | 27907-10000280 |
| Heat Shield SER 148/3 | 27907-40000210 |
| Heat Shield SER 148/6 | 27907-40000220 |
| Viton seal SER 148 3pcs/box | 27907-A00000307 |
| Butyl seal SER 148 3pcs/box | 27907-A00000308 |

OPTIONAL ACCESSORIES

CODE No

| | |
|--|------------------------|
| Printer | 27907-A00001009 |
| Serial cable | 27907-A00000011 |
| Thimble weighing cup | 27907-A00001146 |
| Vafion seal SER 148 3pcs/box | 27907-A00000061 |
| IQ/OQ SER 148 Manual | 27907-A00000073 |
| Handling device for extraction cup (for SER 148/6) | 27907-A00001145 |
| Pincer for weighing cups (for SER 148/6) | 27907-A00001147 |
| Thimbles stand (6 places) | 27907-A00001149 |
| Extraction thimbles holder | 27907-A00001142 |
| Crucible holder HU6 for SER148 | 27907-A00000309 |
| Glass fiber thimbles 33x80, 25pcs/box | 27907-A00000313 |
| Oat meal, 30g | 27907-A00000318 |

INSTRUMENT

POWER SUPPLY

CODE No

| | | |
|-----------|------------------|------------------------|
| SER 148/3 | 230 V / 50-60 Hz | 27907-F30300240 |
| SER 148/3 | 115 V / 50-60 Hz | 27907-F30310240 |
| SER 148/6 | 230 V / 50-60 Hz | 27907-F30300242 |
| SER 148/6 | 115 V / 50-60 Hz | 27907-F30310242 |

SER 148/6

SER 148/3



GENERAL FEATURES AND PERFORMANCE

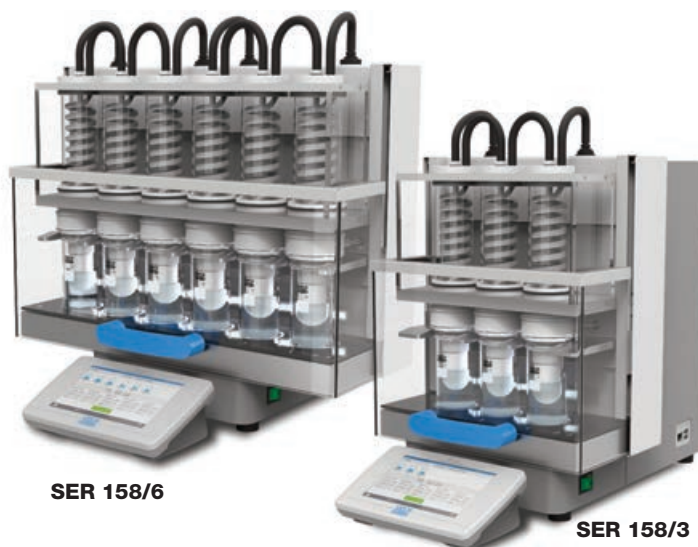
| | |
|------------------------------------|--|
| CONSTRUCTION MATERIAL | Epoxy painted stainless steel structure |
| MAX VOLUME EXTRACTION CUP | 150 ml |
| DISPLAY | Working temperature / settable parameters |
| WORKING TEMPERATURE | From 100 to 260 °C |
| IMMERSION, WASHING & RECOVERY TIME | From 0 to 999 minutes |
| SAMPLE QUANTITY | From 0.5 to 15 g (generally 2-3 g) |
| SOLVENT RECOVERY | From 50 to 75% |
| REPRODUCIBILITY (RSD) | ≤ 1% |
| INTERFACE | RS232 |
| POWER | 500 W (SER 148/3) or 950 W (SER 148/6) |
| DIMENSIONS (WxHxD) | 480x620x390 mm (18.9x24.4x15.4 in) (SER 148/3) 700x620x390 mm (27.6x24.4x15.4 in) (SER 148/6) |
| WEIGHT | 30 Kg (66 lb) (SER 148/3) 40 Kg (88 lb) (SER 148/6) |

SER 158 SOLVENT AUTOEXTRACTOR



The SER 158 is a fully automated solvent extractor offering state-of-the-art technology, precision and smart data management. The operator has to simply prepare the sample and start the analysis with one click, Load&go. The automatic shutdown feature permits unattended operations 24/7. The innovative **ControlPad** is able to control up to 4 SER 158 units independently and features the immediate display of results calculation on the on-board storage. Unparalleled performance are ensured by the **titanium condensers** (patent pending) and by a vast set of sensors. More than 90% of the solvent used is recovered and stored on the internal recovery tank. The SER 158 units are equipped with LED indicating the active position during the extraction steps. VELP Scientifica guarantees total safety to the operators thanks to **SolventXpress™** the hermetically sealed solvent dispensing system ensuring no exposure to the solvent and to **SafeEnd™** the automatic cooling technology that lifts the extract not permitting the overheating.

The SER 158 incorporates **TEMS™** technology for major savings in **Time, Energy, Money and Space** pursuing VELP's contribution to environmental protection.



| INSTRUMENT | POWER SUPPLY | CODE No |
|-------------------------|------------------|-----------------|
| SER 158/3 | 115/230V-50/60Hz | 27907-S303A0390 |
| SER 158/6 | 115/230V-50/60Hz | 27907-S303A0380 |
| SER 158/3 no ControlPad | 115/230V-50/60Hz | 27907-F303A0390 |
| SER 158/6 no ControlPad | 115/230V-50/60Hz | 27907-F303A0380 |

cNemkoUS certified

TECHNICAL SPECIFICATIONS

| | |
|-----------------------------|--|
| POSITIONS | 3-positions (SER158/3) or 6-positions (SER158/6) |
| MAX. CAPACITY | 21 samples/day/unit (SER158/3) or 42 samples/day/unit (SER158/6) |
| SCALABILITY | 12-pos. (up to 4 units) (SER158/3) or 24-pos. (up to 4 units) (SER158/6) |
| DISPLAY | 7" color touch screen - extractable ControlPad |
| SOLVENTS ACCEPTED | Capable of being used with the majority of solvents |
| SOLVENT RECOVERY | > 90% |
| AUTOMATION | Immersion, Removing, Washing, Recovery, Cooling |
| LIGHTING | LED show 3/6 active positions |
| HEATING ELEMENT | Glass ceramic – 3/6 positions independent switch on/off |
| SAMPLE SIZE | 0.5 to 15 g in 33x80 mm thimbles (generally 2-3 g) |
| SEALS | Viton, Butyl, and Vafion |
| CONDENSERS | Titanium (VELP Patent Pending) |
| INTERFACES | 3 x USB (balance, mouse, USB stick), Ethernet (Pc) |
| RESULT CALCULATION | Automatic, archived on ControlPad |
| WATER CONSUMPTION | From 1.0 l/min |
| DIMENSIONS (WXHxD) | 358x546x450 mm (14x21,5x17,7 inch) (SER158/3) 546x546x450 mm (21,5x21,5x17,7 inch) (SER158/6) |
| DIMENSIONS WITH CONTROLPAD | 358x546x570 mm (14x21,5x22,4 inch) (SER158/3) 546x546x570 mm (21,5x21,5x22,4 inch) (SER158/6) |
| WEIGHT (SER 158/CONTROLPAD) | Kg 29 / 1 (64 / 2,2 lb.) (SER158/3) Kg 36 / 1 (80,3 / 2,2 lb.) (SER158/6) |
| POWER SUPPLY | 115/230– 50/60 V-Hz |
| POWER CONSUMPTION | 630/850 W |
| MEASUREMENT RANGE | 0.1-100% |

SUPPLIED WITH

| | CODE No |
|--|-----------------|
| ControlPad* | 27907-A00000286 |
| Grey butyl seal 3pcs/box | 27907-A00000298 |
| Green viton seal 3pcs/box | 27907-A00000297 |
| Extraction cup Ø 56x120mm 3pcs/box STD | 27907-A00000290 |
| Extraction thimbles holder Ø 33mm | 27907-A00000312 |
| Boiling stones, 80g | 27907-A00000305 |
| Cellulose thimbles 33x80mm, 25pcs/box | 27907-A00000295 |
| Inlet water tube | 27907-10000280 |
| Teflon tube Ø 4x6mm | 27907-10002866 |
| Connection 1/8 NPT - tube 6x4 | 27907-10006054 |

* Included only in codes S303A0390 and S303A0380

OPTIONAL ACCESSORIES

| | CODE No |
|--|-----------------|
| White vafion seal SER158 3pcs/box | 27907-A00000288 |
| Extraction cup Ø 48x120mm 3pcs/box S | 27907-A00000303 |
| Extraction cup Ø 65x120mm 3pcs/box L | 27907-A00000302 |
| Extraction thimbles holder Ø 25mm | 27907-A00000291 |
| Extraction thimbles holder Ø 40mm | 27907-A00000292 |
| Cellulose thimbles 25x80mm, 25pcs/box | 27907-A00000294 |
| Cellulose thimbles 40x80mm, 25pcs/box | 27907-A00000296 |
| Glass fiber thimbles 25x80mm, 25pcs/box | 27907-A00000314 |
| Glass fiber thimbles 33x80mm, 25pcs/box | 27907-A00000313 |
| Thimble weighing cup | 27907-A00000310 |
| Thimbles stand 6 places | 27907-A00000311 |
| Handling device extraction cups SER158/6 | 27907-A00000304 |
| Crucible holder HU 6 for SER158 | 27907-A00000293 |
| Complete Glass bottle solvent collection | 27907-A00000301 |
| Inlet Connection 1/4NPT-tube Ø 4,3÷4,5mm | 27907-A00000299 |
| Inlet Connection 1/4NPT-tube Ø 4,8÷5mm | 27907-A00000300 |
| Slave connection cable | 27907-A00000287 |
| Adapter USB-RS232 | 27907-A00000195 |
| Extension lead 2m for Control Pad | 27907-A00000315 |
| IQ/OQ SER158 | 27907-A00000306 |
| Oat meal, 30g | 27907-A00000318 |

HU 6 HYDROLYSIS UNIT

The **HU 6** offers the optimum solution for the acid hydrolysis of food and feed samples prior to solvent extraction for total fat analysis.

Very often the samples to be analyzed have a high fat content and need to be prepared for fat extraction.

The HU 6 is a 6-position hydrolysis unit that combines **safety** with **performance, reducing manual handling** to the minimum.

Hydrolysis is carried out with hydrochloric acid for approximately one hour at a temperature of 170 °C. The hydrolyzed sample is then filtered in a glass crucible and washed with warm de-ionized water in order to eliminate the residues of hydrochloric acid.

The sample is now ready to be processed using the SER 148.

The HU 6 is suitable for both acid and basic hydrolysis.

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|------------------|-----------------|
| HU 6 | 230 V / 50-60 Hz | 27907-F30300110 |
| HU 6 | 115 V / 50-60 Hz | 27907-F30310110 |



GENERAL FEATURES AND PERFORMANCE

| | |
|--|---|
| CONSTRUCTION MATERIAL | Epoxy painted stainless steel structure |
| NUMBER OF SAMPLES | 6 samples |
| SET TEMPERATURE AND COUNTDOWN | Digital readout |
| DISPLAY | LCD |
| PROGRAM LIBRARY | 20 programs |
| LANGUAGES | I, F, UK, E, D, T |
| TEMPERATURE RANGE | Ambient to 200 °C |
| TEMPERATURE PRECISION, STABILITY AND HOMOGENEITY | ± 0.5 °C |
| POWER | 1350 W |
| DIMENSIONS (WxHxD) | 355x590x450 mm (14.0x23.2x17.7 in) |
| WEIGHT | 14.5 Kg (32.0 lb) |

SUPPLIED WITH

| | |
|-------------------------|-----------------|
| Celite, 1 Kg | 27907-A00000097 |
| Glass sand, 2 Kg | 27907-A00000089 |
| EDPM tube Ø 6.4x11.2 mm | 27907-10002412 |

OPERATING ACCESSORIES

| | |
|------------------------------------|-----------------|
| Glassware kit 3 positions for HU 6 | 27907-A00000085 |
| Crucible holder HU 6 for SER158 | 27907-A00000293 |
| Crucible holder HU 6 for SER148 | 27907-A00000309 |

OPTIONAL ACCESSORIES

| | |
|---|-----------------|
| Glass crucibles P1, 6 pcs/box | 27907-A00000086 |
| Glass crucibles P3, 6 pcs/box | 27907-A00000087 |
| Glass bottle for waste collection | 27907-A00000088 |
| Test tubes Ø 42x300 mm, 250 ml, 3 pcs/box | 27907-A00000144 |
| IQ/OQ Manual | 27907-A00000251 |

RAW FIBER EXTRACTION

FIWE RAW FIBER EXTRACTOR



RAW FIBER EXTRACTION

Vegetables and derived products are made up of substances belonging to different categories:

- carbohydrates, proteins, fats, mineral salts;
- a non-digestible component consisting of polymers (lignin, cellulose, hemicellulose, pectin) called "fiber".

There are many reasons why it is very important to determine the fiber content including nutritional, economic and legal reasons.

The **FIWE 3** and **FIWE 6** are suitable for raw fiber determination, conventionally known as an indigestible residue. **Rapid analysis, reliable results** and **high reproducibility** are some of the most relevant benefits of these units which are ideal for the following applications:

- total raw fiber determination (according to Weende)
- neutral detergent fiber and acid detergent fiber determination (NDF and ADF according to Van Soest)
- acid detergent lignin determination (ADL according to Van Soest)
- different fractions of fiber (cellulose, hemicellulose and pectin)

Raw fiber determination is useful for nutritional, economic and legislative aspects. FIWE performs single or sequential extractions including boiling, rinsing and filtration.

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CRUCIBLE

Crucibles are consumables and their lifetime is closely tied to correct use and proper cleaning. The average lifetime is 20-30 analyses. Crucibles have class 2 porosity according to Jena's definition, with 45 μm (40 – 60 μm) (ASTM) holes, class C in the USA.

The correct use of crucibles in the muffle furnace in accordance with the recommendations in the operating manual are crucial.

FIWE 6



FIWE 3

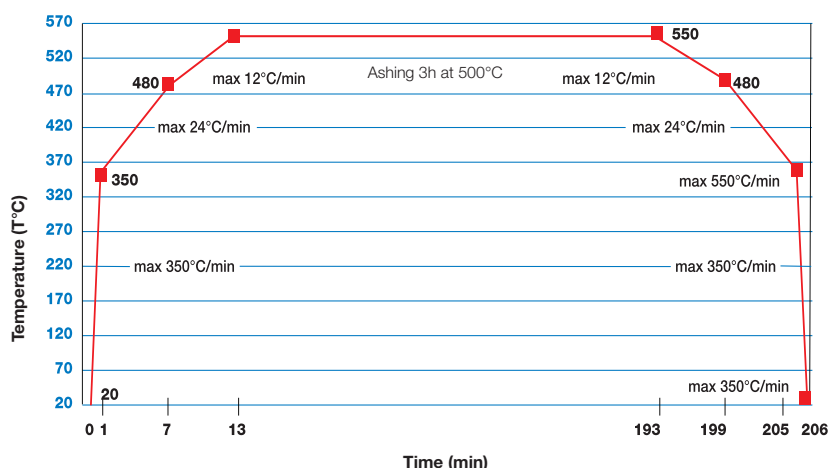


TIPS FOR CRUCIBLE TREATMENT IN A MUFFLE FURNACE

The heating and cooling of glass crucibles for determining ash content requires special care in order to prevent breakages. Thermal shock can lead to breakage, particularly in stressed areas such as the junction between the crucible body and the filter disk. A temperature of 550 °C corresponds to the beginning of glass's plastic state and should not be exceeded.

Maximum rates recommended for heating and cooling glass crucibles are follows:

| Heating °C | Cooling °C | Rate °C/min | Required time min |
|---------------|---------------|----------------|----------------------|
| 20 to 350 | 350 to 20 | 350 | 1 |
| 350 to 480 | 480 to 350 | 24 | 6 |
| 480 to 550 | 550 to 480 | 12 | 6 |



COEX COLD EXTRACTOR

In order to perform a reliable raw fiber determination test, the sample must have a low fat content (<1%). For those samples that exceed this value, **preliminary fat extraction** is required using acetone, hexane or petroleum. The **COEX** performs **rapid fat extraction directly in the same glass crucibles** that are used by the FIWE 3 and FIWE 6. A great benefit as the user can start raw fiber extraction **immediately** after completing fat extraction.

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|---------------|-----------------|
| COEX | 230 V / 50 Hz | 27907-F30520204 |
| COEX | 230 V / 60 Hz | 27907-F30530204 |
| COEX | 115 V / 60 Hz | 27907-F30540204 |

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GENERAL FEATURES AND PERFORMANCE

| | |
|-----------------------|---|
| CONSTRUCTION MATERIAL | Epoxy painted stainless steel structure |
| TYPE OF EXTRACTION | Cold |
| REAGENT DISCHARGE | Peristaltic pump |
| POWER | 120 W |
| DIMENSIONS (WxHxD) | 730x300x380 mm (29.5x11.0x15.0 in) |
| WEIGHT | 19 Kg (41.8 lb) |

SUPPLIED WITH

| | |
|-------------------------------|-----------------|
| Glass crucibles P2, 6 pcs/box | 27907-A00000140 |
|-------------------------------|-----------------|

OPTIONAL ACCESSORIES

| | |
|-------------------|-----------------|
| IQ/OQ manual COEX | 27907-A00000250 |
|-------------------|-----------------|

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|---------------|------------------|
| FIWE 3 | 230 V / 50 Hz | 27907-SA30520201 |
| FIWE 3 | 230 V / 60 Hz | 27907-SA30530201 |
| FIWE 3 | 115 V / 60 Hz | 27907-SA30540201 |
| FIWE 6 | 230 V / 50 Hz | 27907-SA30520200 |
| FIWE 6 | 230 V / 60 Hz | 27907-SA30530200 |
| FIWE 6 | 115 V / 60 Hz | 27907-SA30540200 |

GENERAL FEATURES AND PERFORMANCE

| | |
|----------------------------|--|
| CONSTRUCTION MATERIAL | Epoxy painted stainless steel structure |
| NUMBER OF SAMPLES | 3 (FIWE 3) or 6 (FIWE 6) |
| DIGITAL TIMER | 0 - 99 minutes with acoustic signal at the end of the cycle |
| TYPE OF EXTRACTIONS | Hot and cold |
| SAMPLE REMOVAL | Air pump |
| REAGENT DISCHARGE | Peristaltic pump |
| TEMPERATURE | Electronic regulation |
| REAGENTS AND COOLING WATER | Separated outlets |
| SAMPLES | Individually processed |
| SAMPLE QUANTITY | From 0.5 to 3 g |
| REPRODUCIBILITY (RSD) | ± 1% |
| POWER | 900 W (FIWE 3) or 1200 W (FIWE 6) |
| DIMENSIONS (WxHxD) | 530x620x390 mm (20.9x24.4x15.4 in) (FIWE 3) 760x620x390 mm (29.5x24.4x15.4 in) (FIWE 6) |
| WEIGHT | 35 Kg (77 lb) (FIWE 3) 46 Kg (101.2 lb) (FIWE 6) |

SUPPLIED WITH

| | |
|--|------------------------------------|
| Heat shield (FIWE 3) | 27907-40000167 |
| Heat shield (FIWE 6) | 27907-40000161 |
| Glass crucible P2, 1 pcs/box (3 boxes with FIWE 3) | 27907-A00001140 |
| Glass crucibles P2, 6 pcs/box (FIWE 6) | 27907-A00000140 |
| Holder for 3 crucibles | 27907-40000166 |
| Holder for 6 crucibles | 27907-40000160 |
| PVC tube, 2 mt | 27907-10001086 |
| 2-place hot plate, RC2 type | 27907-F20700430 or 27907-F20710430 |
| Reagent glass bottles | 27907-10001112 |
| Pincer for crucibles | 27907-10000247 |
| Inlet tube | 27907-10000280 |

OPTIONAL ACCESSORIES

| | |
|-------------------------------|-----------------|
| Water spray device | 27907-A00001135 |
| Vafion seal (Scharrer method) | 27907-A00000099 |
| IQ/OQ Manual FIWE | 27907-A00000074 |
| Oat meal, 30g | 27907-A00000318 |

DIETARY FIBER EXTRACTION



DIETARY FIBER EXTRACTION

The procedure for determining dietary fiber exposes the sample to a series of enzymatic digestions that simulate the real digestive process which takes place in the human and animal digestive tract, calculating the undigested residue remaining at the end of the analysis. Generally speaking, dietary fiber analysis is carried out on foods intended for human consumption whereas raw fiber analysis is carried out on animal feeds or on raw materials of vegetable origin, e.g. cereals.

GDE

The **GDE** performs enzymatic digestion, a delicate phase where samples are immersed in a thermostatic water bath and stirred. **Continuous and constant sample mixing** is necessary in order to prevent the sample from overheating. The unit consists of an immersion heating head, a transparent tank and a VELP 6-place magnetic stirrer to ensure **excellent thermoregulation and precision**.

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|------------------|------------------|
| GDE | 230 V / 50-60 Hz | 27970-SA30400209 |
| GDE | 115 V / 50-60 Hz | 27907-SA30410209 |



CSF 6

The **CSF 6** filtration unit carries out the final filtration and washing phase foreseen by the enzymatic method for dietary fiber determination. The CSF 6 used in combination with the GDE is suitable for the determination of total dietary fiber and **reduces the time required** compared to manual procedures considerably. The glass funnels facilitate the introduction of the digested sample and solvents into the instrument. The filtering and final washing stages are **speeded-up** thanks to the vacuum function.

Temperature: up to 550 °C

| INSTRUMENT | POWER SUPPLY | CODE No |
|------------|---------------|-----------------|
| CSF 6 | 230 V / 50 Hz | 27907-F30420210 |
| CSF 6 | 230 V / 60 Hz | 27907-F30430210 |
| CSF 6 | 115 V / 60 Hz | 27907-F30440210 |



GENERAL FEATURES AND PERFORMANCE

| | |
|--------------------|------------------------------------|
| TEMPERATURE RANGE | Ambient to 105 °C |
| POWER | 900 W |
| DIMENSIONS (WxHxD) | 413x295x410 mm (16.2x11.6x16.1 in) |
| WEIGHT | 6.2 Kg (13.66 lb) |

OPTIONAL ACCESSORIES

| | |
|--------------------------|-----------------|
| Beaker, 400 ml | 27907-A00000999 |
| Stirring bar, 6x35 mm | 27907-A00001056 |
| Hollow balls 200 pcs/box | 27907-A00000241 |
| IQ/OQ Manual for GDE | 27907-A00000249 |

AOAC

GENERAL FEATURES AND PERFORMANCE

| | |
|-----------------------|---|
| CONSTRUCTION MATERIAL | Epoxy painted stainless steel structure |
| PERISTALTIC PUMP | High suction capacity |
| RESIDUES COLLECTING | Separate |
| COUNTERPRESSURE | Electronic setting |
| FILTRATION TIME | Shortening |
| POWER | 220 W |
| DIMENSIONS (WxHxD) | 750x420x380 mm (28.7x16.5x15.0 in) |
| WEIGHT | 28 Kg (61.6 lb) |

SUPPLIED WITH

| | |
|-------------------------------|-----------------|
| Glass crucibles P2, 6 pcs/box | 27907-A00000140 |
|-------------------------------|-----------------|

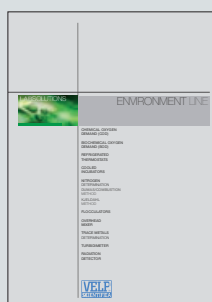
OPTIONAL ACCESSORIES

| | |
|-------------------|-----------------|
| IQ/OQ manual CSF6 | 27907-A00000248 |
|-------------------|-----------------|

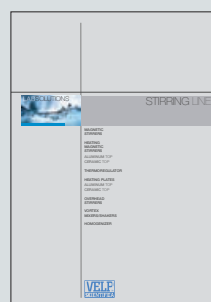


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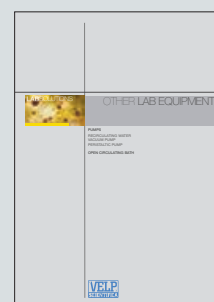
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www.velp.com



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