UDK Distillation Units Series
A Full Range of Solutions for Kjeldahl Distillation
The distillation unit is used to perform nitrogen and protein content analysis according to the Kjeldahl Method (TKN) in the Food & Feed industries and for several other applications in environmental control (phenols, nitrogen in water, sludge, soil and lubricant), chemical and pharmaceutical industries after having digested the sample accurately.

UDK distillation units work in accordance with a variety of Standards (such as AOAC, ISO, EPA, DIN etc.).

**VELP Solutions for KJELDAHL Analysis**

1. **DIGESTION**  
   DKL Series / DK Series DIGESTERS  
   JP RECIRCULATING WATER PUMP  
   SMS SCRUBBER

2. **DISTILLATION** with steam generator  
   UDK Series DISTILLATION UNITS

3. **TITRATION**  
   UDK 149 PREDISPOSITION FOR CONNECTION TO THE MOST IMPORTANT AUTO-TITRATOR  
   UDK 159 / UDK 169 INTEGRATED TITRATION SYSTEM

**Features and Benefits**
- Intuitive
- Extremely Precise
- Versatile
- Eco-friendly
- Compact
- Innovative

Accurate nitrogen and protein determination in absolute safety.

**UDK Distillation Units**

VELP Scientifica is pleased to announce its fourth generation of Distillation Units. Unparalleled technology along with premium materials for high-quality products and extremely reliable results in terms of the quantification of nitrogen and protein in different samples.
TEM'S™
Saving
Time, Energy, Money and Space

Patented Steam Generator

- 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, completely maintenance-free
- Extremely Reliable
  The high level of precision and accuracy ensure correct and detailed results
- Deionized Water
  The use of deionized water prevents misleading results (no nitrogen in deionized water) and the formation of limescale

Patented Titanium Condenser

- 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
- Minimal Maintenance
  Easy to disassemble and clean

Technopolymer Splash Head

- Long-Life
  The best and most durable solution when a large number of samples are processed
- High Chemical Resistance
  Highly resistant to alkaling and chemical solutions, used during steam distillation
- No Risk of Breakage
  Ensures safe working conditions in the laboratory
- Maintenance-free and Easy to Replace
  No maintenance required, extremely easy to replace when necessary

Technopolymer Housing

- High Durability
  Unique structure able to resist to chemical attacks for unprecedented resistance
- Long-Life
  Extremely compact and robust, designed to last
- Space Saving
  Narrow footprint for optimum use of the lab bench
- Safety Lever, Protective Door and Service Door
  Improved safety and comfort
The UDK 129 is the entry level model for accurate and precise nitrogen and protein determination according to the Kjeldahl Method (TKN). This unit is the ideal solution for basic needs with foregoing the same key components and benefits of the more advanced models.

UDK 129 - Distillation Unit

Features and Benefits
- Automatic NaOH addition
- Delay time (Devarda alloy analysis)
- Alkali resistant technopolymer housing
- Selectable distillation time
- LCD display
- Safety lever and sensors to protect the user

UDK 139 - Semi-Automatic Distillation Unit

Features and Benefits
- Automatic NaOH and H₂O addition
- Steam regulation (10-100%)
- Delay time (Devarda alloy analysis)
- 10-program library
- Alkali resistant technopolymer housing
- Reagent level warning
- Selectable distillation time
- Distillation residues removal
- 3.5” color touch screen
- 2 x USB ports
- Language selection
- Safety lever and sensors to protect the user

All the UDK Series Distillation Units accept different kinds of test tubes: straight tubes (100, 250, 400 ml and 1 liter) or Kjeldahl balloon (500 ml). Each unit comes ready to use and is supplied with 250 ml test tube, 250 ml collecting flask, pincer, set of inlet and outlet tubes. Optional accessories such as test tubes, test tube spacer, test tube connection, connection cables and IQ/OQ/PQ manual are available on request.
**UDK 149 - Automatic Distillation Unit, with Titrator Connection**

The UDK 149 is a more flexible solution for laboratories performing Kjeldahl distillation. Fully automatic, it can be easily connected to a large choice of external titrators.

**Features and Benefits**
- Automatic NaOH, H₂O and H₃BO₃ addition
- Steam regulation (10-100%)
- Delay time (Devarda alloy analysis)
- Automatic titration vessel washing
- Washing
- 20-program library
- Alkali resistant technopolymer housing
- Reagent level warning
- Selectable distillation time
- Distillation and titration residues removal
- Distillation in series
- Archive for on-board data storage
- 3.5” color touch screen
- Ethernet, 2 x USB ports, RS232 and TTL
- Language selection
- Safety lever and sensors to protect the user
- Several external titrators supported

**UDK 159 - Automatic Distillation & Titration System**

The UDK 159 combines all the advantages of a fully automatic distillation with the added benefits of integrated colorimetric titration (AOAC approved) for a high-performance all-in-one system.

**Features and Benefits**
- Automatic NaOH, H₂O and H₃BO₃ addition
- Steam regulation (10-100%)
- Delay time (Devarda alloy analysis)
- Washing and blank analysis
- Automatic titration vessel washing
- 55-program library (31 pre-defined + 24 customizable)
- Alkali resistant technopolymer housing
- Reagent level warning
- Distillation and titration residues removal
- Distillation in series
- Reporting
- Archive for on-board data storage
- 6” color touch screen
- Ethernet, 2 x USB ports and RS232
- Balance connection
- Electronic user guide
- Language selection
- Safety lever and sensors to protect the user
UDK 169 & AutoKjel - Automatic Distillation & Titration System with Kjeldahl Autosampler

The UDK 169 is the top of the range solution to quantify the nitrogen/protein content. A fully automated Kjeldahl analyzer, with an integrated colorimetric titrator for premium performance and continuous operation. It offers the highest sample throughput available when connected to the AutoKjel autosampler, for the most productive system available. Just load your sample and walk away; the system will achieve maximum reliability and accuracy on your samples. Upgrade your UDK 169 Kjeldahl analyzer with AutoKjel autosampler at any time!

**Features and Benefits**
- Automatic NaOH, H₂O and H₃BO₃ addition
- Steam regulation (10-100%)
- Delay time (Devarda alloy analysis)
- Washing and blank analysis
- Automatic titration vessel washing
- 55-program library (31 pre-defined + 24 customizable)
- Alkali resistant technopolymer housing
- Reagent level warning
- Tanks included with AutoKjel (2x20-liter, 1x10-liter, 1x5-liter)
- Smart reagent consumptions estimation
- Multi-tasking software with full autosampler control
- Distillation and titration residues removal
- Distillation in series
- Instantaneous reporting
- Archive for on-board data storage
- 6” color touch screen
- Ethernet, 2 x USB ports and RS232
- Balance connection
- Electronic user guide
- Language selection
- Safety lever and sensors to protect the user
UDK Series complies with many official methods for different applications such as the determination of ammoniacal nitrogen, protein determination, nitrogen content (Kjeldahl or direct alkaline distillation), nitric nitrogen (after reduction/Devarda), phenols, volatile acids, cyanides and alcohol content. A short list of the most common samples with the corresponding reference(s) follows, but many others can be tested according to the official methods (AOAC, ISO, DIN, EPA, etc.).

### Kjeldahl Protein/Nitrogen on Food&Feed Samples

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>METHODS (main reference, many others are complied)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Feed and Pet Food</td>
<td>AOAC 984.13</td>
</tr>
<tr>
<td>Beer (and its ingredients: barley, malt, wort)</td>
<td>AOAC 920.53, AOAC 950.09</td>
</tr>
<tr>
<td>Bread and Baked Products</td>
<td>AOAC 950.36</td>
</tr>
<tr>
<td>Milk and Derived Products (including cheese)</td>
<td>ISO-IDF 8966-1/20-1-2014</td>
</tr>
<tr>
<td>Cereals and Grains (wheat, oats, barley, corn, rice, rye, soy beans, lupins, etc.)</td>
<td>AOAC 979.09</td>
</tr>
<tr>
<td>Malt</td>
<td>AOAC 950.09</td>
</tr>
<tr>
<td>Meat and Derived Products (bacon, ham, salami, sausage, liver paté, etc.)</td>
<td>AOAC 981.10</td>
</tr>
<tr>
<td>Nuts and Nut Products (almonds, coconuts, peanuts, etc.)</td>
<td>AOAC 950.48</td>
</tr>
<tr>
<td>Pasta (e.g. macaroni, etc.)</td>
<td>AOAC 930.25</td>
</tr>
<tr>
<td>Plants (vegetables, forage, straw, seeds, tea, etc.)</td>
<td>AOAC 978.04</td>
</tr>
<tr>
<td>Yeast</td>
<td>AOAC 962.10</td>
</tr>
</tbody>
</table>

...and many others

### Kjeldahl Nitrogen on Other Samples

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>METHODS (main reference, many others are complied)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>ISO 333:1996</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>AOAC 920.03</td>
</tr>
<tr>
<td>Lubricating Oils and Fuel Oils</td>
<td>ASTM D3228-96</td>
</tr>
<tr>
<td>Paper and Paperboard (gelatin, casein)</td>
<td>TAPPI STD T418 05-61</td>
</tr>
<tr>
<td>Rubber, Raw Natural, and Rubber Latex</td>
<td>ISO 1656:1996</td>
</tr>
<tr>
<td>Soil</td>
<td>“Method of soil analysis” part 2 – Chemical and microbiological properties, 2nd ed.</td>
</tr>
<tr>
<td>Urea</td>
<td>ISO 1592:1977</td>
</tr>
<tr>
<td>Water</td>
<td>AOAC 973.48</td>
</tr>
</tbody>
</table>

...and many others

### Other Applications

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>METHODS (main reference, many others are complied)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Determination</td>
<td>Reg. (CEE) 2970/2000, EBC 9.2.1</td>
</tr>
<tr>
<td>Cyanides in Waste Water</td>
<td>EPA 9910C</td>
</tr>
<tr>
<td>Nitric Nitrogen on Water after Reduction (Devarda Method)</td>
<td>ISO 10048:1991</td>
</tr>
<tr>
<td>Phenols in Water, Saline Water, Domestic and Industrial Wastes</td>
<td>EPA 9085; APAT CNR IRSA 5070</td>
</tr>
<tr>
<td>Total Volatile Basic Nitrogen (TVBN) in Fresh/Frozen Fish</td>
<td>Conway &amp; Byrne Method (1933)</td>
</tr>
<tr>
<td>Urea and Ammoniacal Nitrogen in Animal Feed</td>
<td>AOAC 941.04</td>
</tr>
<tr>
<td>Volatile Acidity of Tomato Paste</td>
<td>Reg. (CEE) 1764/96</td>
</tr>
<tr>
<td>Volatile Acidity of Wines</td>
<td>Reg. (CEE) 266/90</td>
</tr>
<tr>
<td>Sulphur</td>
<td>AOAC 962.16, AOAC 990.29</td>
</tr>
</tbody>
</table>

...and many others

### Fields of Application

- **Food, feed and beverage industry**
- **Environmental industry**
- **Pharmaceutical and chemical industry**
Inlet tube, discharge tube and protective film for touch screen are supplied with the instrument.

**ANALYSIS TIME**
- UDK 129: 5 min (for 100 ml), 4 min (for 100 ml), 3 min (for 100 ml) from 4 min (titration included)
- UDK 139: 5 min (for 100 ml), 4 min (for 100 ml), 3 min (for 100 ml) from 4 min (titration included)
- UDK 149: 5 min (for 100 ml), 4 min (for 100 ml), 3 min (for 100 ml) from 4 min (titration included)
- UDK 159: 5 min (for 100 ml), 4 min (for 100 ml), 3 min (for 100 ml) from 4 min (titration included)
- UDK 169: 5 min (for 100 ml), 4 min (for 100 ml), 3 min (for 100 ml) 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

**GENERAL FEATURES**
- OVERALL DIMENSIONS IN MM [(W)x(H)x(D)]
  - UDK 129: 385x780x1616 (15.2x30.7x16.4)
  - UDK 139: 385x780x1616 (15.2x30.7x16.4)
  - UDK 149: 385x780x1616 (15.2x30.7x16.4)
  - UDK 159: 385x780x1616 (15.2x30.7x16.4)
  - UDK 169: 385x780x1616 (15.2x30.7x16.4)
- OVERALL WEIGHT IN KG (lb)
  - UDK 129: 24 (52.9)
  - UDK 139: 26 (57.3)
  - UDK 149: 27 (60.5)
  - UDK 159: 31 (68.3)
  - UDK 169: 31 (68.3)
- POWER SUPPLY
  - UDK 129: 230 V / 115 V
  - UDK 139: 230 V
  - UDK 149: 230 V
  - UDK 159: 230 V
  - UDK 169: 230 V
- POWER
  - UDK 129: 2100 W / 1700 W
  - UDK 139: 2100 W
  - UDK 149: 2100 W
  - UDK 159: 2200 W
  - UDK 169: 2200 W

**INSTRUMENT**
- UDK 129
- UDK 129
- UDK 139
- UDK 149
- UDK 159
- UDK 169
- AutoKjel
- UDK 169 & AutoKjel

**POWER SUPPLY**
- 230 V / 50-60 Hz
- 115 V / 50-60 Hz

**CODE No**
- F30200120
- F30201020
- F30201360
- F30200140
- F30200150
- F30200160
- F30200430
- S30200160

**OPTIONAL ACCESSORIES**

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