



LABSOLUTIONS

# UDK

## Distillation Units Series

A Full Range of Solutions for Kjeldahl Distillation

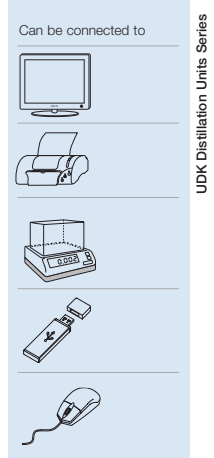


The distillation unit is used to perform nitrogen and protein content analysis according to the Kjeldahl Method (TKN) in the Food & Feed industries and for several other applications in environmental control (phenols, nitrogen in water, sludge, soil and lubricant), chemical and pharmaceutical industries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

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

### 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.



**Corrosion-Resistant Technopolymer Housing** with a smooth and unjointed surface for a longer life span and to facilitate cleaning.

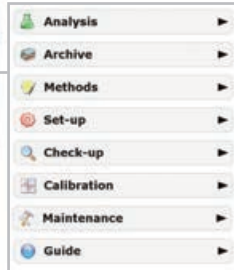


**Limited Consumption** of energy (steam generator with low thermal dispersion) and of cooling water (from only 0.5 l/min).



**High Performance,** maintenance-free, accurate and precise.

**Safe Operating Conditions,** no risk of contact with chemical substances.



**Color Touch Screen** to simplify use and readability (3.5" on UDK 139 & UDK 149; 6" on UDK 159 & UDK 169).



**Officially Approved Colorimetric Titration** simplifies validation (AOAC recommended). Automatic titration for faster results.

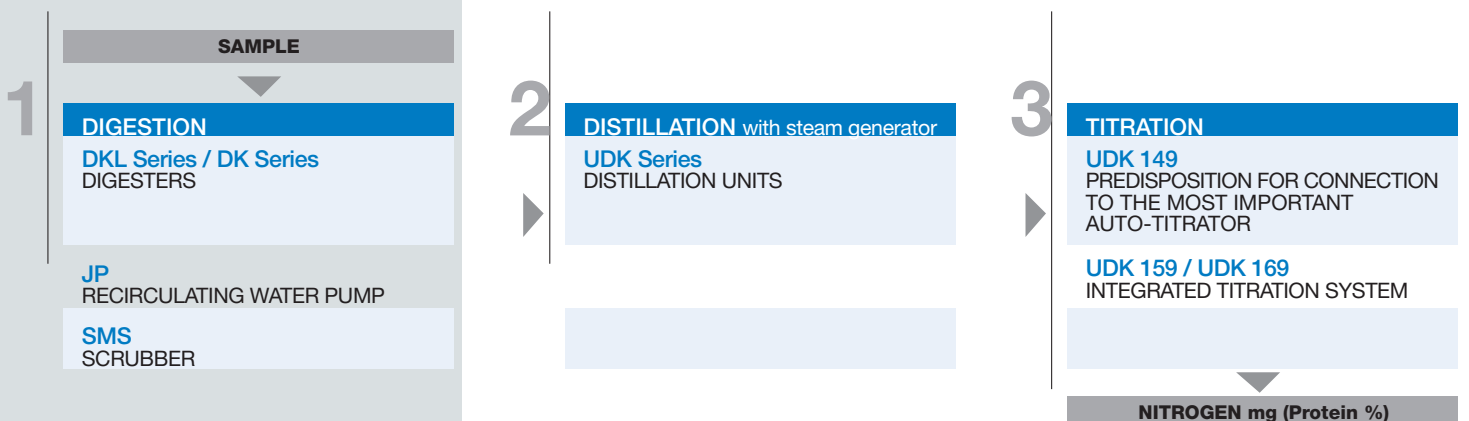
### Features and Benefits

- Intuitive
- Extremely Precise
- Versatile
- Eco-friendly
- Compact
- Innovative

Accurate nitrogen and protein determination in absolute safety.

**GLP** Good Laboratory Practice  
**AOAC • AACC • ASBC**  
**ISO • IFFO • OIV**

## VELP Solutions for KJELDAHL Analysis





TEMS technology saves  
Time, Energy, Money and Space

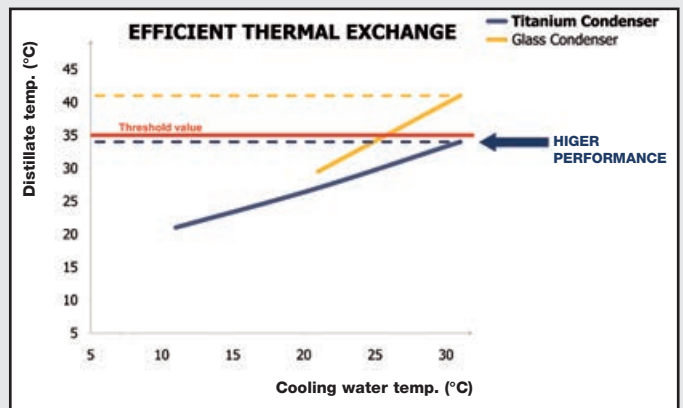
- Time Saving: Fast and frequent analyses; no heating delay between runs.
- Energy Saving: Cooling water consumption starting from only 0.5 l/min; excellent insulation of internal parts.
- Money Saving: Cost reduction is substantial, in line with reduced power consumption.
- Space Saving: The extremely compact footprint saves useful laboratory bench space.

## 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



\* Tap water flow rate 1 l/min

## 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

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.

## UDK 129 - Distillation Unit

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.

Automatic Addition of NaOH



UDK 129

### 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

The UDK 139 is the semi-automatic model offering greater automation and a wider range of programming options.

Automatic Addition of NaOH - H<sub>2</sub>O



UDK 139

### Features and Benefits

- Automatic NaOH and H<sub>2</sub>O 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

## UDK 149 - Automatic Distillation Unit, with Titrator Connection

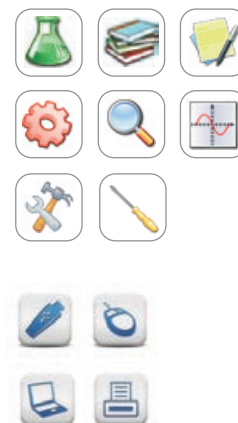
The UDK 149 is a more flexible solution for laboratories performing Kjeldahl distillation. Fully automatic, it can be easily connected to a large choice of external titrators.

Automatic Addition of  
NaOH - H<sub>2</sub>O - H<sub>3</sub>BO<sub>3</sub>



UDK 149

MULTIPLE CHOICE  
(on request)



### Features and Benefits

- Automatic NaOH, H<sub>2</sub>O and H<sub>3</sub>BO<sub>3</sub> 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

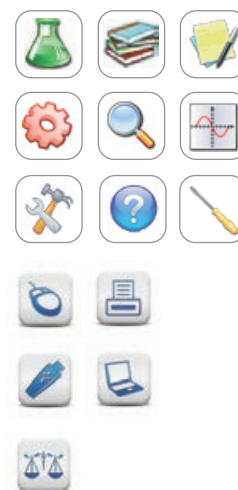
## UDK 159 - Automatic Distillation & Titration System

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.

Automatic Addition of  
NaOH - H<sub>2</sub>O - H<sub>3</sub>BO<sub>3</sub>  
Titrant Solution



UDK 159



### Features and Benefits

- Automatic NaOH, H<sub>2</sub>O and H<sub>3</sub>BO<sub>3</sub> 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

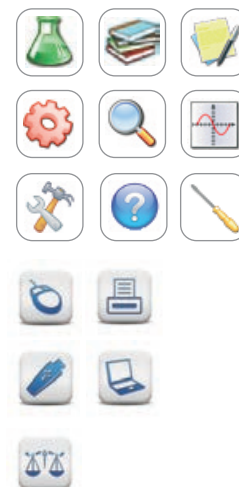
- Distillation and titration residues removal
- Distillation in series
- Reporting
- Archive for on-board data storage
- 6" color touch screen
- Ethernet, 2 x USB ports and RS232
- Balance connection
- Electronic user guide
- Language selection
- Safety lever and sensors to protect the user

# 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



Automatic Addition of  
 $\text{NaOH} - \text{H}_2\text{O} - \text{H}_3\text{BO}_3$   
 Titrant Solution



21-position carousel,  
 400 ml tubes (optional)

24-position carousel,  
 250 ml tubes (standard)

**UDK 169 & AutoKjel**

## Features and Benefits

- Automatic  $\text{NaOH}$ ,  $\text{H}_2\text{O}$  and  $\text{H}_3\text{BO}_3$  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 official methods (AOAC, ISO, DIN, EPA, etc.).

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

DESCRIPTION	METHODS (main reference, many others are complied)
Animal Feed and Pet Food	AOAC 984.13
Beer (and its ingredients: barley, malt, wort)	AOAC 920.53, AOAC 950.09
Bread and Baked Products	AOAC 950.36
Milk and Derived Products (including cheese)	ISO-IDF 8968-1/20-1:2014
Cereals and Grains (wheat, oats, barley, corn, rice, rye, soy beans, lupins, etc.)	AOAC 979.09
Malt	AOAC 950.09
Meat and Derived Products (bacon, ham, salami, sausage, liver patè, etc.)	AOAC 981.10
Nuts and Nut Products (almonds, coconuts, peanuts, etc.)	AOAC 950.48
Pasta (e.g. macaroni, etc.)	AOAC 930.25
Plants (vegetables, forage, straw, seeds, tea, etc.)	AOAC 978.04
Yeast	AOAC 962.10

...and many others

### Kjeldahl Nitrogen on Other Samples

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

...and many others

### Other Applications

DESCRIPTION	METHODS (main reference, many others are complied)
Alcohol Determination	Reg. (CEE) 2870/2000, EBC 9.2.1
Cyanides in Waste Water	EPA 9010C
Nitric Nitrogen on Water after Reduction (Devarda Method)	ISO 10048:1991
Phenols in Water, Saline Water, Domestic and Industrial Wastes	EPA 9065; APAT CNR IRSA 5070
Total Volatile Basic Nitrogen (TVBN) in Fresh/Frozen Fish	Conway & Byrne Method (1933)
Urea and Ammoniacal Nitrogen in Animal Feed	AOAC 941.04
Volatile Acidity of Tomato Paste	Reg. (CEE) 1764/86
Volatile Acidity of Wines	Reg. (CEE) 266/90
Sulphur	AOAC 962.16, AOAC 990.28

...and many others

### Fields of Application



Food, feed and beverage industry



Environmental industry



Pharmaceutical and chemical industry

INSTRUMENT	POWER SUPPLY	CODE No
UDK 129	230 V / 50-60 Hz	F30200120
UDK 129	115 V / 50-60 Hz	F30210120
UDK 139	230 V / 50-60 Hz	F30200130
UDK 149	230 V / 50-60 Hz	F30200140
UDK 159	230 V / 50-60 Hz	F30200150
UDK 169	230 V / 50-60 Hz	F30200160
AutoKjel	230 V / 50-60 Hz	F30200430
UDK 169 & AutoKjel	230 V / 50-60 Hz	S30200160

OPTIONAL ACCESSORIES	CODE No
Spacer for test tube Ø 48x260 mm	A00000206
Test tube connection Ø 26 mm, Ø 48 mm and 500 ml Kjeldahl balloon	A00000043
Printer (UDK 139, 149, 159, 169)	A00001009
Printer Adapter (UDK 139, 149, 159, 169)	A00000195
UDK 129 IQ/OQ/PQ Manual	A00000205
UDK 139 IQ/OQ/PQ Manual	A00000204
UDK 149 IQ/OQ/PQ Manual	A00000203
UDK 159 IQ/OQ/PQ Manual	A00000202
UDK 169 IQ/OQ/PQ Manual	A00000254
AutoKjel IQ/OQ Manual	A00000256
Waterproof mouse (for UDK 139, 149, 159, 169)	A00000215
USB cable	10003134
Titrator Titroline Easy K for UDK 149	R30800194
Acid resistant pump kit	A00000220

#### Supplied with



<b>A00001080</b> Test tube ø 42x300 mm	<b>10001106</b> Collecting flask 250 ml	<b>10000247</b> Princer for test tubes	<b>10004936</b> Touch pen (for UDK 139, 149, 159, 169)
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Inlet tube, discharge tube and protective film for touch screen are supplied with the instrument



	UDK 129	UDK 139	UDK 149	UDK 159	UDK 169	
<b>PERFORMANCE</b>	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)			•	•	•	
<b>TITRATION</b>	TITRATION RESIDUES REMOVAL			•	•	
	AUTOMATIC TITRATION VESSEL WASHING			•	•	
<b>CONNECTION</b>	MOUSE		•	•	•	
	PRINTER		•	•	•	
	PC (for data storage)			•	•	
	PEN DRIVE (for data transfer)			•	•	
	BALANCE				•	
AUTOSAMPLER					•	
<b>GENERAL FEATURES</b>	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

Constant Commitment to  
Knowledge Development

Your authorized agent:

We reserve the right to make technical alterations  
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