

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 GoodLaboratoryPractice
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 NH₃. 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 ₂ SO ₄ + 0,1g CuSO ₄ x 5 H ₂ O, 1000 pcs/box	A00000274
KjTabs™ VKPC 4,5g K ₂ SO ₄ + 0,5g CuSO ₄ x 5 H ₂ O, 1000 pcs/box	A00000275
KjTabs™ VCT 5g K ₂ SO ₄ + 0,15g CuSO ₄ x 5 H ₂ O + 0,15g TiO ₂ , 1000 pcs/box	A00000276
KjTabs™ VST 3,5g K ₂ SO ₄ + 3,5mg Se, 1000 pcs/box	A00000277
KjTabs™ VTCT 3,5g K ₂ SO ₄ + 0,105g CuSO ₄ x 5 H ₂ O + 0,105g TiO ₂ , 1000 pcs/box	A00000281
KjTabs™ VW 4,875 g Na ₂ SO ₄ + 0,075 g CuSO ₄ x 5 H ₂ O + 0,050 g Se, 1000 pcs/box	A00000282
KjTabs™ VS Antifoam 0,97 g Na ₂ SO ₄ + 0,03g Silicone, 1000 pcs/box	A00000283
Vreceiver™ TKN formula for 1l sol., 40g	A00000316
Nitrogen-free weighing boats, 58x10x10 mm, 100 pcs/box	CM0486000
Nitrogen-free weighing boats, 70x23x15 mm, 100 pcs/box	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.



DK 20



DK 6



DK 8



DK 6/48



DK 20/26



DK 42/26

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

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

OPERATING ACCESSORIES	CODE No
DK 6 Sample rack with heat shields	A00001111
DK 6 Suction cap	A00001096
DK 6 Support system	A00001206
DK 6/48 Sample rack with heat shields	A00001113
DK 6/48 Suction cap	A00001101
DK 6/48 Support system	A00001206
DK 8 Sample rack with heat shields	A00000063
DK 8 Suction cap	A00000065
DK 8 Support system	A00000064
DK 20/26 Sample rack with heat shields	A00001110
DK 20/26 Suction cap	A00109626
DK 20/26 Support system	A00001206
DK 20 Sample rack	A00000168
DK 20 Suction cap and drip tray	A00000169
DK 20 Support system	A00000190
DK 42/26 Sample rack	A00000180
DK 42/26 Suction cap and drip tray	A00000179
DK 42/26 Support system	A00000190
DK 6 / DK 8 / DK 20 Test tubes Ø 42x300 mm, 250 ml, 3 pcs/box	A00000144
DK 6/48 Test tube Ø 48x260 mm, 300 ml, 1 pcs/box	A00001088
DK 20/26 / DK 42/26 Test tubes Ø 26x300 mm, 100 ml, 6 pcs/box	A00000146

OPTIONAL ACCESSORIES	CODE No
DK 6, 8, 20 Glass cap	A00000243
DK 6 / DK 6/48 Drip tray	A00001200
DK 6 / DK 6/48 / DK 20/26 Stand for sample rack	A00001097
DK 8 Stand for sample rack	A00000067
DK 20 / DK 42/26 Stainless steel stand for sample rack	A00000182
Printer	A00001009
Null modem connector for printer	A00000010
Serial cable	A00000005
IQ/OQ Manual for DK Series	A00000075

ACCESSORIES FOR COD ANALYSIS *	CODE No
COD Test tubes Ø 42x200 mm, 200 ml, 3 pcs/box	A00000145
DK 6 COD Sample rack	A00001049
DK 20 COD Sample rack	A00000237
Air refrigerator with ground cone	A00001041
Antisplash bell	A00001045
PTFE sheat for 29/32 cone	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	S30100200
DKL 8 *	115 V / 50-60 Hz	S30110200
DKL 12 *	230 V / 50-60 Hz	S30100190
DKL 12 *	115 V / 50-60 Hz	S30110190
DKL 20 *	230 V / 50-60 Hz	S30100210
DKL 42/26 *	230 V / 50-60 Hz	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	A00000145
DKL 20 COD Sample rack	A00000237
Air refrigerator with ground cone	A00001041
Antisplash bell	A00001045
PTFE sheat for 29/32 cone	A00001042

* DKL 20 only

SUPPLIED WITH

CODE No

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

OPTIONAL ACCESSORIES

CODE No

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

		DK SERIES	DKL FULLY AUTO SERIES
GENERAL FEATURES	CONSTRUCTION MATERIAL	Epoxy painted stainless steel structure	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	-	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	A00001164
Filter for activated carbon	A00001165
IQ/OQ manual SMS	A00000252

JP RECIRCULATING WATER PUMP



	POWER SUPPLY	CODE No
JP	230 V / 50 HZ	F30620198
JP	230 V / 60 HZ	F30630198
JP	115 V / 60 HZ	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	A00000253
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NITROGEN/PROTEIN DETERMINATION

UDK 129 DISTILLATION UNIT

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

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	F30200120
UDK 129	115 V / 50-60 Hz	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
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UDK 139	230 V / 50-60 Hz	F30200130
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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
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UDK 149	230 V / 50-60 Hz	F30200140
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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 continuously 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	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	F30200160
AutoKiel	230 V / 50-60 Hz	F30200430
UDK 169 with AutoKiel	230 V / 50-60 Hz	S30200160

cNemkoUS certified



21-position carousel,
400 ml tubes (optional)

24-position carousel,
250 ml tubes (standard)

STEAM GENERATOR

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

TITANIUM CONDENSER

PATENTED

- 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			
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	A00001080
Collecting flask, 250 ml	10001106
Pincer for test tubes	10000247
Touch pen (for UDK 139, 149, 159, 169)	10004936

OPTIONAL ACCESSORIES

CODE No

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

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