

NDS - 3223

Nitrogen Distillation System



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

►► Product Introduction

A complete range of distillers to meet any laboratory requirement for the determination of analytes in different fields of application

►► Distillation Units

The NDS Series Distillers are designed to meet the most challenging demands and requirements for diverse applications, according to international standards: Kjeldahl nitrogen TKN, proteins, ammoniacal nitrogen, nitric nitrogen (Devarda), phenols, TVBN and volatile acids, cyanides, and alcohol content. Five different NDS models are available with different automation levels to match any laboratory requirement of automation and throughput.

►► UNRIVALED FLEXIBILITY

The NDS Distillers address any laboratory requirements from few samples per day to unattended operations with different level of automation for NaOH, H₂O and Boric Acid addition.

The regulation of the steam power (10% -100%), dedicated accessories and premium technologies ensure a wide application range for diverse analytes in diverse industrial fields.

►► UNMATCHED RESISTANCE AND RELIABILITY

The ATL NDS distillers are equipped with a full range of sensors and safe systems designed for maximum operator protection.

The patented steam generator, patented titanium condenser and the tetrafluoropolymer splash head provide maximum resistance and low maintenance, reducing the cost of ownership.

►► PREMIUM PRECISION AND ACCURACY

The NDS distillers guarantee reproducible results with a RSD ≤ 1% and are able to recover more than 99.5% of Nitrogen.

With a Limit of Detection of 0.015 mg N the NDS are the perfect solution even for challenging low nitrogen applications.



►► SUPERIOR EASE OF USE

The multitasking software with its intuitive user interface guides the operator step by step throughout the analysis.

The 7" display ensures easy operations and the multiple connectivity options widen the possibilities of workflows optimizations.

►► MAXIMIZED EFFICIENCY

The barcode technology streamlines routine operation for Kjeldahl analyses. The exclusive connectivity to ATL Ermes Cloud Platform (LAN cable or WIFI) projects your lab from time-consuming manual operations to a data-rich environment with premium remote service support.

►► ATL SOLUTIONS FOR KJELDAHL ANALYSIS

SAMPLE

1 DIGESTION

DKL SERIES / DK SERIES
DIGESTERS

JP
RECIRCULATING WATER VACUUM PUMP

SMS
SCRUBBER

2 DISTILLATION

NDS SERIES
DISTILLATION UNITS

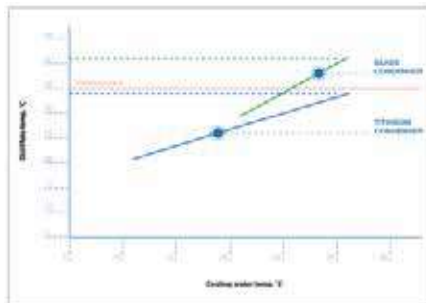
3 TITRATION

NDS 149
CONNECTIVITY TO EXTERNAL TITRATION
SYSTEMS

NDS 159 / NDS 169
INTEGRATED COLORIMETRIC TITRATION
SYSTEM

NITROGEN mg (Protein %)

►► Making a Difference



►► SAFETY AND REPEATABILITY WITH THE PATENTED STEAM GENERATOR

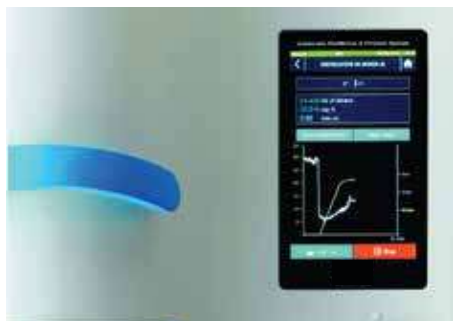
All the NDS models have inbuilt the patented steam generator technology ensuring premium performance and maximum safety. Heating time is very fast, the system works without pressure for the maximum safety, steam output is very stable ensuring repeatability of analyses and is a maintenance-free component reducing the cost of ownership.

►► EFFICIENT THERMAL EXCHANGE WITH THE PATENTED TITANIUM CONDENSER

ATL innovative titanium condenser is able to ensure high performance and considerable water savings (from 0.5 l/min). The graph shows the high efficiency of the titanium condenser compared to the traditional glass. The titanium condenser ensures that distillate temperature always remains below the safe threshold value (35 °C), as indicated in the Kjeldahl method.

►► UNMATCHED RESISTANCE WITH THE TECHNOPOLYMER SPLASH HEAD

The ATL NDS Distillers come with the unique technopolymer splash head ensuring the highest chemical resistance for the longest durability. ATL splash head in technopolymer is able to last up to 10,000 analyses before being serviced.



►► **MULTI-TASKING SOFTWARE AND PREMIUM CONNECTIVITY**

The ATL Distillers from NDS 3139 to NDS 3169 feature a 7" touch screen with an easy-to-use and intuitive software that facilitates daily operations and allows the lab to benefit from premium connectivity options for accessories and cloud-based services.

►► **ACHIEVE COMPLIANCE TO 21 CFR PART 11**

The Kjeldahl analysis is a primary method for the determination of Nitrogen in Quality Control, especially in pharmaceutical laboratories. NDS 3159 and NDS 3169 are fully compliant with FDA's Code of Federal Regulations Title 21 Part 11 that defines the requirements for using electronic records and electronic signatures on computerized systems.

►► **MAXIMUM VERSATILITY WITH A WIDE RANGE OF ACCESSORIES**

Configure your distillation unit based on your analytical and laboratory requirements. The barcode technology simplifies distillation data management and results calculation.

►► ATL ERMES CONNECTION

Connect the NDS Distillation Units to the exclusive ATL Ermes Cloud Platform to improve your laboratory experience. The ATL Ermes Cloud Platform connection will unburden you from tedious tasks improving your lab productivity.

- Enhanced service support
- Real time monitor and control of the instrument from PC, smart-phone and tablet whenever you want, wherever you are
- Immediate alert and notification with the possibility to stop the instrument for maximum safety
- Regular software updates will guarantee the best performance and new features with just one-click



►► NDS 3129 Distillation Unit

The NDS 3129 is the ATL entry level distiller guaranteeing an ideal solution for a wide range of laboratories looking for a reliable

YOUR BENEFITS

- Accurate dosing of reagents with high precision NaOH pump
- Chemically-resistant technopolymer housing
- Intuitive interface for easy analysis settings
- Lever operation simplifies tube insertion / removal
- Unmatched flexibility with a wide accessory range

**Automatic Addition of
NaOH**



►► **NDS 3139 Semi-Automatic Distillation Unit**

The NDS 3139 is a semi-automatic distiller ideal to manage low-medium throughput requirements. The exclusive interface and software and the connectivity option guarantee the best-in-class features of high-end instruments in a semi-automatic analyzer.

YOUR BENEFITS

- The semi-automatic process ensures efficient operations
- Selectable steam generation output level 10% – 100% for maximized analytical versatility
- Auto removal of residues from sample tube
- Clear and intuitive operations thanks to the Smart User Interface and 7" digital display
- Up to 10 customizable methods
- Multi-lingual support
- Maximum safety for the operator
- Unmatched flexibility with a wide accessory range
- Ability to connect: 2 USB (mouse, printer, pen drive; Wi-Fi adapter); Ethernet (Pc, Hermes)



Automatic Addition of

NaOH .H₂O

►► **NDS 3149 Automatic Distillation Unit**

The NDS 3149 is ATL fully automatic distillation unit with external potentiometric titrator connection.

YOUR BENEFITS

- Connection to various external titrators for automated processing and efficient operations
- Premium result accuracy and precision
- Selectable steam generation output level 10% – 100% for maximized analytical versatility

- Auto removal of residues from sample tube
- Clear and intuitive operations thanks to the Smart User Interface and 7" digital display
- Up to 20 customizable methods
- Multi-lingual support
- Maximum safety for the operator
- Unmatched flexibility with a wide accessory range
- Ability to connect: 2 USB (balance, barcode scanner, mouse, printer, pen drive; Wi-Fi adapter); Ethernet (Pc, Ermes); RS232 (external titrator)

Automatic Addition of

NaOH . H₂O . H₃BO₃



►► External Potentiometric Titrator

The NDS 3149 connectivity is optimized for the most common automatic titrators to guarantee fully automated operations.

The optional TITROLINE 5000 Automatic Titrator is a very compact titrator for simple routine titrations. GLP compliant results can be documented on a connected printer or USB-memory stick.

TITRATION FEATURES

- Automatic Titration
- Real time volume dosing of the titrant
- Automatic cleaning and washing of the titrant solution vessel
- Titrations to pH, mV - endpoint (2 EP)
- Titrations with dynamic or linear titration solution additions
- Maximum versatility



►► **NDS 3159 Automatic Distillation & Titration System**

The NDS 3159 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.

YOUR BENEFITS

- The fully automatic process ensures efficient operations, distillation and titration performed simultaneously
- Shortest time-to-results with online titration and automatic results calculation
- Premium result accuracy and precision thanks to the integrated colorimetric titrator with high precision burette
- Selectable steam generation output level 10% – 100% for maximized analytical versatility
- Auto removal of residues from titrator & sample tube
- Clear and intuitive operations thanks to the Smart User Interface and 7" digital display
- Maximum safety for the operator
- Unmatched flexibility with a wide accessory range
- Ability to connect: 2 USB (balance, barcode scanner, mouse, printer, pen drive; Wi-Fi adapter); Ethernet (Pc, Ermes)



Automatic Addition of

NaOH

. H₂O . H₃BO₃

Titrant Solution

Integrated

Colorimetric Titrator

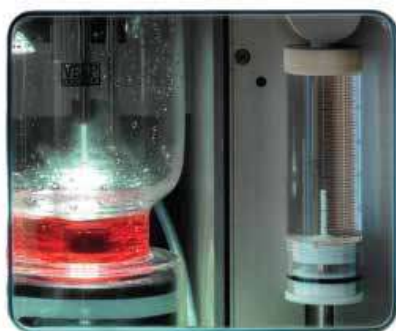
AOAC Recommended

►► Colorimetric Titration (NDS 3159 - 3169)

The colorimetric titration is based on precise chemical reactions with indicators. ATL integrated titrator is maintenance-free and is AOAC recommended. It works by dosing an acidic titrant solution to the boric acid containing the ammonia distilled from the sample. This titration process results in a color change that is evaluated by the system.

1 RED

Absence of ammonia



VRECEIVER

ATL unique Vreceiver is 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 receiving solution preparation for colorimetric titration.

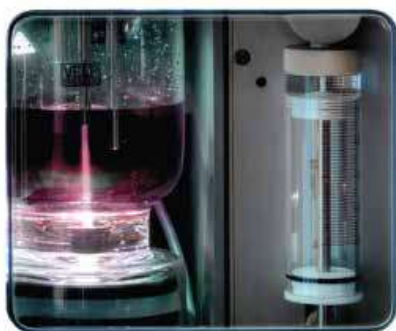
2 GREEN

Significant amount of ammonia is flowing into the receiving solution



3 GREY/PINK

End point of the analysis



►► **NDS 3159 Automatic Distillation & Titration System**

The NDS 3169 is the fully automated distiller 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. Just load your samples and walk away: the system will carry out analysis of all samples unattended and store the results.

YOUR BENEFITS

- The fully automatic process ensures efficient operations, distillation and titration performed simultaneously
- Shortest time-to-results with online titration and automatic results calculation
- Premium result accuracy and precision thanks to the integrated colorimetric titrator with high precision burette
- Selectable steam generation output level 10% – 100% for maximized analytical versatility
- Auto removal of residues from titrator & sample tube
- Clear and intuitive operations thanks to the Smart User Interface and 7" digital display
- Maximum safety for the operator
- Unmatched flexibility with the autosampler and a wide accessory range
- Ability to connect: 2 USB (balance, barcode scanner, mouse, printer, pen drive; Wi-Fi adapter); Ethernet (Pc, Ermes); RS232 (Autosampler)

Automatic Addition of

NaOH . H₂O .H₃BO₃

Titrant Solution

Integrated


Colorimetric Titrator


AOAC Recommended




►► Main Applications and Methods

NDS 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, sulphur, cyanides and alcohol content. A short list of the most common samples with the corresponding references follows, but many others can be tested according to official methods (AOAC, ISO, DIN, EPA, AACC etc.).

Nitrogen / Protein on Food&Feed Samples		
DESCRIPTION		METHODS (main reference, many others are complied)
	Animal feed and pet food	AOAC 984.13, EN ISO 5983-2 (AOAC 2001:11)
	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, ISO 20483, ISO 8968-2, ISO 8968-3, ISO 8968-4
	Cereals and grains (wheat, oats, barley, rice, rye, soy beans, etc.)	AOAC 979.09 EN ISO 5983-2 (AOAC 2001:11)
	Malt	AOAC 950.09
	Meat and derived products (bacon, ham, sausage, liver patè, etc.)	ISO 937 (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
	Oil seeds	EN ISO 5983-2 (AOAC 2001:11)

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

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

TEMS



NDS Series Kjeldahl distillation units work with the innovative TEMS™ benefits, for unmatched savings.

Time Saving: Rapid heating reduces wasted time

Energy Saving: Limited energy consumption thus cutting CO₂ emissions

Money Saving: Cost reduction for each analysis

Space Saving: The narrow footprint saves valuable laboratory bench space

►► **OPTIONAL ACCESSORIES**

Vreceiver TKN formula for 1L, 10 pcs/pack
Tube connection Ø26, Ø48
Spacer for test tube Ø 48x260 mm
Guide for test tube Ø 50 AUTOKJEL
Carousel for 21x400 ml tubes AUTOKJEL
H3BO3 tank with caps (NDS3149,3159,3169)
NaOH tank with caps (NDS1X9)
H2O tank for NDS or H2O and residue tank
for FIWE Advance
Residues tank with caps
Barcode scanner with USB socket
Wireless barcode scanner
USB Wi-Fi adapter
Waterproof mouse
Printer
Adapter USB-RS232
Kit SI Analytics TL5000/7000/7750/7800
Kit conness. Mettler T5-T7-T9-G10S-G20S
Glass splash head kit NDS
Glass splash head kit NDS3129
Acid pump kit NDS1X9 230V
Acid pump kit NDS129 115V
IQ/OQ NDS3129 Manual
IQ/OQ NDS3139 Manual
IQ/OQ/PQ NDS3149 Manual
IQ/OQ/PQ NDS3159 Manual
IQ/OQ/PQ NDS3169 Manual
IQ/OQ AUTOKJEL Manual
TITROLINE 5000 Automatic titrator NDS 3149
21 CFR part 11 package for NDS 3169-3159
ATL Ermes 1 year Connection
ATL Ermes 3 years Connection

►► INSTRUMENT - CODE

NDS 3129	230 V / 50-60 Hz
NDS 3129	115 V / 60 Hz
NDS 3139	230 V / 50-60 Hz
NDS 3149	230 V / 50-60 Hz
NDS 3159	230 V / 50-60 Hz
NDS 3169	230 V / 50-60 Hz
AutoKjel	230 V / 50-60 Hz
NDS 3169 & AutoKjel	230 V / 50-60 Hz

►► SUPPLIED WITH



Test tube
Ø 42x300 mm



Collecting
flask 250 ml



Princer for
test tubes

►► TEST TUBES AND KITS



Test tube 250 ml
Ø 42x300 mm



Test tube 100 ml
Ø 26x300 mm



Test tube 300 ml
Ø 48x260 mm



Test tube 400 ml
Ø 50x300 mm



Test tube 1000ml
Ø 80x300 mm



Kjeldahl balloon
500 ml



Alcoholic
strength kit

►► FIELDS OF APPLICATION



FOOD, FEED AND BEVERAGE INDUSTRY

ENVIRONMENTAL INDUSTRY

PHARMACEUTICAL AND CHEMICAL INDUSTRY

	NDS 3129	NDS 3139	NDS 3149	NDS 3159	NDS 3169
ANALYSIS TIME	5 min for 100 ml of distillate	4 min for 100 ml of distillate	3 min for 100 ml of distillate	From 4 min (titration included)	From 4 min (titration included)
MEASURING RANGE	0.04 - 220 mg N	0.04 - 220 mg N	0.04 - 220 mg N	0.04 - 220 mg N	0.04 - 220 mg N
REPRODUCIBILITY (RSD)	≤ 1%	≤ 1%	≤ 1%	≤ 1%	≤ 1%
RECOVERY	≥ 99.5 %	≥ 99.5 %	≥ 99.5 %	≥ 99.5 %	≥ 99.5 %
DETECTION LIMIT (LOD)	> 0.015 mg N	> 0.015 mg N	> 0.015 mg N	> 0.015 mg N	> 0.015 mg N
SODIUM HYDROXIDE ADDITION	Automatic	Automatic	Automatic	Automatic	Automatic
WATER ADDITION	-	Automatic	Automatic	Automatic	Automatic
BORIC ACID ADDITION	-	-	Automatic	Automatic	Automatic
DISTILLATION RESIDUES REMOVAL	-	Automatic	Automatic	Automatic	Automatic
TITRATION RESIDUES REMOVAL	-	-	Automatic	Automatic	Automatic
TITRATION VESSEL CLEANING	-	-	Automatic	Automatic	Automatic
SELECTABLE DISTILLATION TIME	Yes	Yes	Yes	Not necessary	Not necessary
STEAM FLOW REGULATION	-	10 - 100 %	10 - 100 %	10 - 100 %	10 - 100 %
DELAY TIME (DEVARDA ALLOY ANALYSIS)	00 sec - 99 min 59 sec	00 sec - 99 min 59 sec	00 sec - 99 min 59 sec	00 sec - 99 min 59 sec	00 sec - 99 min 59 sec
WATER CONSUMPTION	From 0,5L/min to 15 °C From 1 L/min to 30 °C	From 0,5L/min to 15 °C From 1 L/min to 30 °C	From 0,5L/min to 15 °C From 1 L/min to 30 °C	From 0,5L/min to 15 °C From 1 L/min to 30 °C	From 0,5L/min to 15 °C From 1 L/min to 30 °C
DISPLAY	LCD display	7" color touch screen	7" color touch screen	7" color touch screen	7" color touch screen
DISTILLATION IN SERIES	-	-	Yes	Yes	Yes
USER MANAGEMENT	-	Yes	Yes	Yes	Yes
BARCODE TECHNOLOGY	-	-	Yes	Yes	Yes
LANGUAGE SELECTION	-	Yes	Yes	Yes	Yes
PROGRAMS	1 customizable	10 customizable	20 customizable	32 standard + 24 customizable	32 standard + 24 customizable
ARCHIVE (ON-BOARD DATA STORAGE)	-	-	Yes	Yes	Yes
21 CFR PART 11 COMPLIANCE	-	-	-	Yes, accessory	Yes, accessory
CONNECTIVITY	-	2 x USB; Ethernet	2 x USB; Ethernet; RS232 (external titrator)	2 x USB; Ethernet	2 x USB; Ethernet; RS232 (Autosampler)
POWER INPUT	1700 W at 115 V 2200 W at 230 V	2200 W	2200 W	2200 W	2300 W
DIMENSIONS (WxHxD)	385x780x416 mm 15.2x30.7x16.4 in	385x780x416 mm 15.2x30.7x16.4 in	385x780x416 mm 15.2x30.7x16.4 in	385x780x416 mm 15.2x30.7x16.4 in	385x780x416 mm 15.2x30.7x16.4 in
WEIGHT	25 kg; 55 lb	26 kg; 57.3 lb	27 kg; 59.5 lb	31 kg; 68.3 lb	31 kg; 68.3 lb
ERMES CONNECTION	-	Yes, via Wi-Fi or LAN	Yes, via Wi-Fi or LAN	Yes, via Wi-Fi or LAN	Yes, via Wi-Fi or LAN

HPLC Servicing, Validation, Trainings and Preventive Maintenance :

HPLC Servicing :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

Trainings :We also take up preventive Maintenance to reduce downtime of HPLC's Trainings.

AMC's/CMC :AMC's/CMC :We offer user training both in-House and at customer sites on HPLC principles, operations, trouble-shooting.

Validations :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.

Instruments :Instruments :We offer instruments/Renting Services Modules like pumps,detector etc. on Rent.



About Analytical Technologies

Analytical Technologies is synonymous for offering technologies for doing analysis and is the Fastest Growing Global Brand having presence in at least 96 countries across the global. Analytical Technologies Limited is an ISO:9001 Certified Company engaged in Designing, Manufacturing, Marketing & providing Services for the Analytical, Chromatography, Spectroscopy, Bio Technology, Bio Medical, Clinical Diagnostics, Material Science & General Laboratory Instrumentation. Analytical Technologies, India has across the Country operations with at least 4 Regional Offices, 6 Branch Offices & Service Centers. Distributors & Channel partners worldwide.

Our Products & Technologies



Regulatory compliances



Corporate Social Responsibility

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:



Analytical
Foundation

1. Research & Innovation Scientist's awards/QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personalities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at Info@analyticalfoundation.org

2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXYFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.



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