UDK Series

Distillation Units

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

UDK Distillation Units

The UDK 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 UDK models are available with different automation levels to match any laboratory requirement of automation and throughput.

UNRIVALED FLEXIBILITY

The UDK 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 VELP UDK distillers are equipped with a full range of sensors and safety systems designed for maximum operator protection.

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

PREMIUM PRECISION AND ACCURACY

The UDK 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 UDK 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 VELP Ermes Cloud Platform (LAN cable or WI-FI) projects your lab from time-consuming manual operations to a data-rich environment with premium remote service support.

VELP SOLUTIONS FOR KJELDAHL ANALYSIS

SAMPLE

1 DIGESTION

DKL SERIES / DK SERIES
DIGESTERS

JP
RECIRCULATING WATER VACUUM PUMP

SMS
SCRUBBER

2 DISTILLATION

UDK SERIES
DISTILLATION UNITS

3 TITRATION

UDK 149
CONNECTIVITY TO EXTERNAL TITRATION SYSTEMS

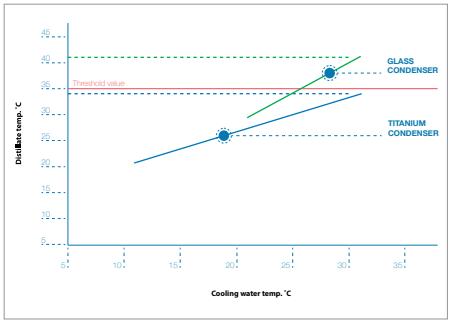
UDK 159 / UDK 169
INTEGRATED COLORIMETRIC TITRATION SYSTEM

NITROGEN mg (Protein %)

Making a Difference

SAFETY AND REPEATABILITY WITH THE PATENTED STEAM GENERATOR

All the UDK 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.

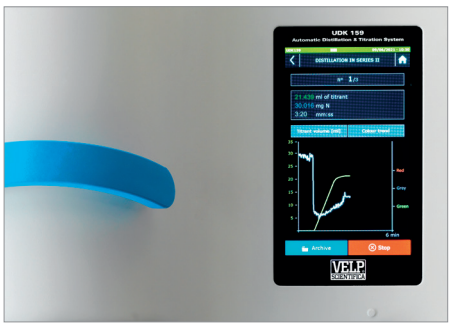


EFFICIENT THERMAL EXCHANGE WITH THE PATENTED TITANIUM CONDENSER

VELP 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.

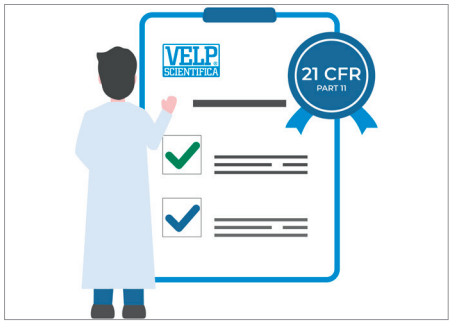
UNMATCHED RESISTANCE WITH THE TECHNOPOLYMER SPLASH HEAD

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



MULTI-TASKING SOFTWARE AND PREMIUM CONNECTIVITY

The VELP Distillers from UDK 139 to UDK 169 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.



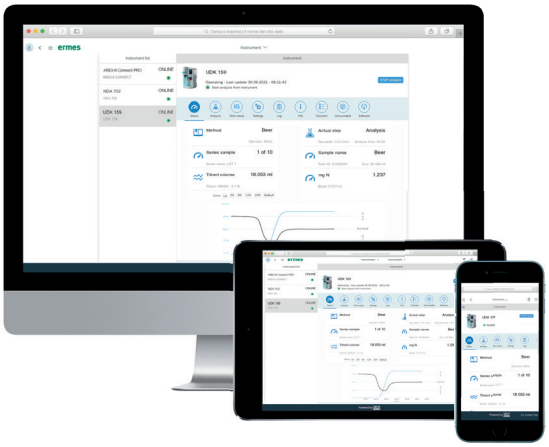
ACHIEVE COMPLIANCE TO 21 CFR PART 11

The Kjeldahl analysis is a primary method for the determination of Nitrogen in Quality Control, especially in pharmaceutical laboratories. UDK 159 and UDK 169 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.

VELP ERMES CONNECTION



Connect the UDK Distillation Units to the exclusive VELP Ermes Cloud Platform to improve your laboratory experience. The VELP 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, smartphone 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

ermes enabled

UDK 129 Distillation Unit

The UDK 129 is the VELP entry level distiller guaranteeing an ideal solution for a wide range of laboratories looking for a reliable instrument with limited automation.

Automatic Addition of

NaOH

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

UDK 139 Semi-Automatic Distillation Unit

The UDK 139 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.

Automatic Addition of

NaOH · H_2O

YOUR BENEFITS

- The semi-automatic process ensures efficient operations
- Selectable steam generation output level 10% – 100% for maximized analytical versality
- 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, Ermes)

ermes enabled

UDK 149 Automatic Distillation Unit

The UDK 149 is VELP fully automatic distillation unit with external potentiometric titrator connection.

Automatic Addition of

$NaOH$ · H_2O · H_3BO_3

ermes enabled

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 versality
- 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)

External Potentiometric Titrator

The UDK 149 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

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_2O · H_3BO_3

Titrant Solution

Integrated

Colorimetric Titrator

AOAC Recommended

ermes enabled

YOUR BENEFITS

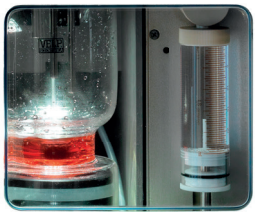
- The fully automatic process ensures efficient operations, distillation and titration performed simultaneously
- Shortest time-to-results with online titration and automatic results calculation
- Premium result accuracy and precision thanks to the integrated colorimetric titrator with high precision burette
- Selectable steam generation output level 10% – 100% for maximized analytical versality
- 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)

Colorimetric Titration (UDK 159 - 169)

The colorimetric titration is based on precise chemical reactions with indicators. VELP 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.

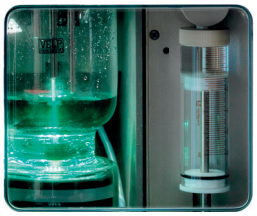
1 RED

Absence of ammonia



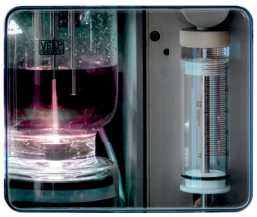
2 GREEN

Significant amount of ammonia is flowing into the receiving solution



3 GREY/PINK

End point of the analysis



VRECEIVER™

VELP 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.

Code **A00000411**

UDK 169 Distillation & Titration System with Autosampler

The UDK 169 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 versality
- 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 · H_2O · H_3BO_3

Titrant Solution

Integrated

Colorimetric Titrator

AOAC Recommended

24-position carousel
250 ml tubes (standard)

21-position carousel
400 ml tubes (optional)

ermes enabled

Main Applications and Methods

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, 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 refererence, 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 refererence, 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 refererence, 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

TEMS™ SAVING

UDK 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 CO_2 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	A00000411
Test tube connection Ø 26 mm, Ø 48 mm and 500 ml Kjeldahl balloon	A00000043
Spacer for test tube Ø 48x260 mm	A00000206
Guide for test tube Ø 50 AUTOKJEL	A00000255
Carousel for 21x400 ml tubes AUTOKJEL	A00000247
H3BO3 tank with caps (UDK149,159,169)	A00000264
NaOH tank with caps (UDK1X9)	A00000265
H2O tank for UDK or H20 and residue tank for FIWE Advance	A00000266
Residues tank with caps	A00000267
Barcode scanner with USB socket	A00000364
Wireless barcode scanner	A00000365
USB Wi-Fi adapter	A00000392
Waterproof mouse	A00000215
Printer	A00001009
Adapter USB-RS232	A00000195
Kit SI Analytics TL5000/7000/7750/7800	A00000211
Kit conness. Mettler T5-T7-T9-G10S-G20S	A00000214
Glass splash head kit UDK	A00000216
Glass splash head kit UDK129	A00000238
Acid pump kit UDK1X9 230V	A00000422
Acid pump kit UDK129 115V	A00000423
IQ/OQ UDK129 Manual	A00000424
IQ/OQ UDK139 Manual	A00000425
IQ/OQ/PQ UDK149 Manual	A00000426
IQ/OQ/PQ UDK159 Manual	A00000427
IQ/OQ/PQ UDK169 Manual	A00000428
IQ/OQ AUTOKJEL Manual	A00000256
TITROLINE 5000 Automatic titrator UDK 149	R30800194
21 CFR part 11 package for UDK 169-159	A00000429
VELP Ermes 1 year Connection	E00010012
VELP Ermes 3 years Connection	E00010036

Visit VELP website to discover our preventive maintenance kits. VELP Kit is designed to keep your running with high performances while ensuring long life and reliability, even under high workloads.

INSTRUMENT - CODE

UDK 129	230 V / 50-60 Hz	**F30200125**
UDK 129	115 V / 60 Hz	**F30210125**
UDK 139	230 V / 50-60 Hz	**F30200135**
UDK 149	230 V / 50-60 Hz	**F30200145**
UDK 159	230 V / 50-60 Hz	**F30200155**
UDK 169	230 V / 50-60 Hz	**F30200165**
AutoKjel	230 V / 50-60 Hz	**F30200430**
UDK 169 & AutoKjel	230 V / 50-60 Hz	**S30200165**

SUPPLIED WITH

A00001080
Test tube
Ø 42x300 mm

10001106
Collecting
flask 250 ml

10000247
Princer for
test tubes

Inlet tube, discharge tube and protective film for touch screen are supplied with the instrument

TEST TUBES AND KITS

A00000144
Test tube 250 ml
Ø 42x300 mm

A00000146
Test tube 100 ml
Ø 26x300 mm

A00001088
Test tube 300 ml
Ø 48x260 mm

A00000185
Test tube 400 ml
Ø 50x300 mm

A00001083
Test tube 1000ml
Ø 80x300 mm

A00000082
Kjeldahl balloon
500 ml

A00000285
Alcoholic
strength kit

FIELDS OF APPLICATION

TECHNICAL DATA

	UDK 129	UDK 139	UDK 149	UDK 159	UDK 169
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 0,5 L / min to 15 °C From 1 L / min to 30 °C	From 0,5 L / min to 15 °C From 1 L / min to 30 °C	From 0,5 L / min to 15 °C From 1 L / min to 30 °C	From 0,5 L / min to 15 °C From 1 L / min to 30 °C	From 0,5 L / 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

SERVICE & SUPPORT

VELP Scientifica products are designed by our engineers to resist years of laboratory use.

Our products are manufactured with premium materials to guarantee the best performance with maximum safety.

According to our experience, a proper and regular maintenance is necessary to ensure the highest performance of analytical instrument.

VELP Service Department and VELP Official Partners are always ready to offer you maintenance and service support tailored to your needs.

GET THE SUPPORT YOU NEED CHOOSING THE OPTIONS:

- Installation
- Preventive Maintenance
- Help-desk and Remote support
- Technical Assistance
- Analytical Support
- Calibration Certification

We reserve the right to make technical alterations
We do not assume liability for errors in printing, typing or transmission

VELP Official Partner

DESIGNED AND MANUFACTURED IN ITALY

ITALY – HQ
Via Stazione 16
20865 Usmate (MB) Italy
Tel. +39 039 628811
velpitalia@velp.com

INDIA
velpindia@velp.com

USA
155 Keyland Court, Bohemia
NY 11716 - U.S.
Tel. +1 631 573 6002
velpusa@velp.com

CHINA
Xinlong Rd Building 28, Lane 1333
Shanghai city - China
Tel. +86 18017557329
velpchina@velp.com

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