Edition 2008/2009

CELEBRATING
25th
ANNIVERSARY

Catalog 2008/2009

VELP SCIENTIFICA

VELP® SCIENTIFICA

VELP Scientifica/Profile

VELP Scientifica is a reliable partner in developing advanced equipment and analytical solutions for laboratories, universities, research centers and companies involved in scientific research.
Our worldwide steady expansion reflects our commitment to advancing knowledge in evolving sectors such as health and safety in food industry, environmental control and laboratory analysis.
VELP Scientifica owes its success to its creativity and expertise, its conspicuous investments in R&D and its ongoing technological development aimed at maximizing productivity, product differentiation and speeding up time-to-market.
Through its extensive international distribution network in more than 60 countries, VELP delivers Italian value across the globe.
Our goal is to achieve increasingly high performance and to look to the future in the knowledge that we can offer our customers ever better solutions and services.

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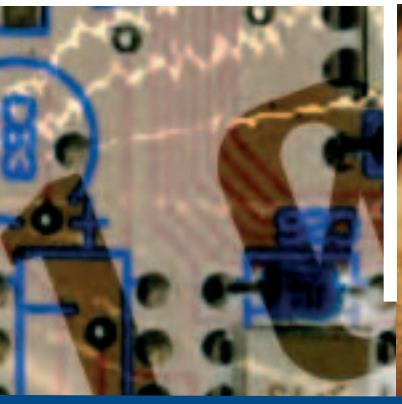
KNOWLEDGE DEVELOPMENT

VITALITY

IDEAS AND CREATIVITY

INNOVATION



Our mission is to transform our commitment to the pursuit of knowledge into the ability to develop innovative customer-oriented solutions.
Vitality, innovation, attention to detail and an infinite passion are the fundamental values of VELP Scientifica.
We deliver originality along with a unique combination of ideas, creativity, enthusiasm and concreteness.

Our vitality spurs us to develop new solutions for the everyday needs of laboratories.
By broadening our expertise and know-how and conducting intensive research, we are able to develop exciting new ideas and innovative, high-performance products.
Attention to detail is a key aspect of our philosophy and lies at the heart of the standards of excellence our company has achieved.

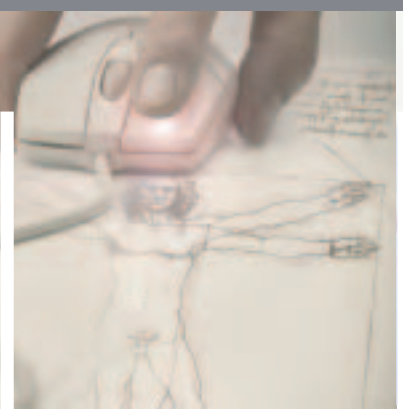
A customer focus is an essential part of our management approach and a cornerstone of our philosophy.
Likewise, we see a solid relationship with customers who share our spirit as a crucial element of building partnerships.

Our mission, our values...

the keys to a success we wish to share...

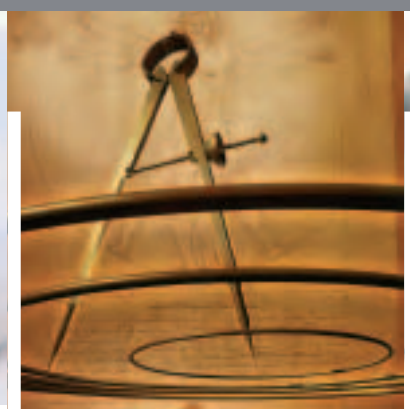
Proverbial Italian creativity plays a crucial role in designing and developing VELP products, along with innovative design and a distinctive style that combine harmoniously to fulfill the needs of practicality and functionality.
Last but not least, is the infinite passion and unyielding enthusiasm of an outstanding and dynamic team.

These are the values behind the world of VELP which we invite you to explore. A world that is constantly evolving, a world that guarantees continuous and unsparing commitment to the development of new solutions and the fulfilment of increasingly ambitious goals.

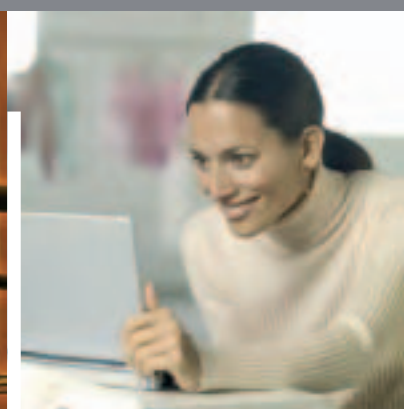


CONCRETENESS

SIMPLICITY



ATTENTION TO DETAIL



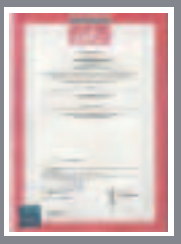
PASSION

VELP Scientifica profile

25 years after it was first set up, VELP Scientifica is now a **reliable partner in developing advanced solutions** and instruments for laboratories, universities, research centers and companies engaged in scientific research.
Through specific choices and targeted strategies, VELP has established a firm position in the world market and a reputation as a company that puts its philosophy of "constant commitment to knowledge development" into practice.
Velp Scientifica operates in the domestic and global marketplace through a **qualified network of Partner dealers**.

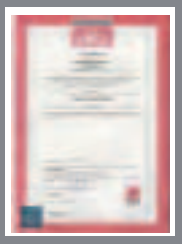
Its attention to the needs of distributors is the mainstay of the company's philosophy, backed by an awareness of the value generated by a strong spirit of partnership. The company's guiding principle in managing relationships with customers consists of developing and maintaining long-term relationships founded on the pursuit of common goals.

Company **certification** in areas of fundamental importance to VELP ethics is a source of pride for our management.



Certification
ISO 9001
VISION 2000

Certification
ISO 14001



Certification
OHSAS 18001

How to contact us

VELP Scientifica is dedicated to strengthening its partnerships with customers by providing high-quality technical and analytical assistance and effective sales support for their promotional, sales and after-sales service activities.

VELP offers its know-how and professional expertise with the aim of providing the best possible support. This enables our partners to work with their customers in optimum conditions.

Commercial Information
Our staff is at your complete disposal. For detailed commercial info, please contact:
inse@velp.it

E-Shop
Remember that you can use our **online order system** to submit orders simply, quickly and securely. All you have to do is to go to the Reserved Area on our web site and enter your username and password.
www.velp.com

Our **Analytical Support Service** is available to our Partners (and to users of our instruments).
Our staff can help you with problems concerning fields of application and use of our instruments and analytical kits. They can offer expert advice on analytical problems and further information on the official methods to be followed.
analyticalsupport@velp.it

Our **Technical Support Service** offers competent support and information on technical issues, specifications and the performance of the Laboratory Solutions developed by VELP Scientifica.
We invite you to contact us for any support you may need for your pre-sales or after-sales requirements.
service@velp.it

Explore the VELP universe…

VELP Scientifica has always been deeply committed to developing the most advanced technological solutions and cutting-edge services for its customers.
The enormous opportunities offered by the Internet have led our company to adopt a web-oriented approach using the best resources available on the market.

Don't miss the opportunity to explore the "VELP Universe". Simply click on our web site **www.velp.com** to find out about the many advantages available.

www.velp.com An immediate and direct operating tool.
Our website is a simple and effective tool providing information on our organization, our global market network, our philosophy, our products, solutions and services.

The Velp Scientifica website aims to be a useful tool for our customers' daily activities, helping them to find immediately the specific information required by end users.

www.velp.com The e-shop area: simple, quick and secure.
The updated e-commerce section allows VELP Partners to directly access information relating to their sales activities, the availability of VELP instruments in stock, and of course the possibility to order items of interest in a guided, simple and quick manner with the utmost security.

www.velp.com The new Newsletter Service offers the possibility to be updated in real-time about the latest news from the VELP world whilst the possibility to download informative and commercial documentation represents a further and important support tool.

Visit our web site **www.velp.com** and explore the VELP universe: a continuously evolving world awaits you.

www.velp.com

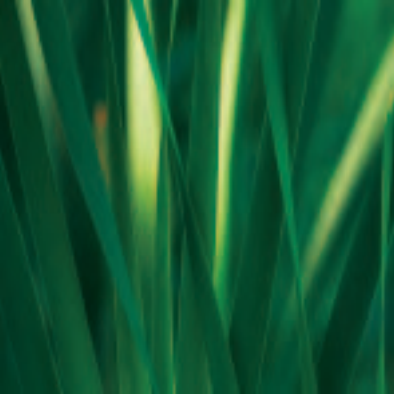
Manuals

Together with the instruments VELP supplies an operation manual to support the user.
It contains information about installation, operation controls, maintenance, electric scheme, spare parts and accessories.

Velp instruments are projected and tested according to International Standards

CEI EN 61010-1	DIN EN 61010	UL 3101-1
IEC 1010	VDE 0411 1	CAN-CSA C22-2
CEI EN 61326/A1	CEI IEC 61326-1	UL 3111-1
CEI EN 61000	CEI IEC 1000	AS/NZS 2D64
CEI EN 55014	CEI EN 55022	CEI IID-1


VELP
SCIENTIFICA



Environment Line

The alterations man makes on the natural environment require a growing number of analytical tests in order to be able to assess their current state and determine which interventions have to be adopted so as to reinstate acceptable conditions.
The quality of water, an essential resource for life, calls for particularly systematic research work. Velp Scientifica manufactures instruments that make the analyst's job easier by providing accurate and reproducible results.

Research, innovation and technology are resources we use in order to develop equipment that ensures reproducible results and simple though effective use.

Index

Thermoreactors

WHAT IS COD?

The pollution caused by the organic and inorganic substances in a waterway (wastewater or surface water) can be evaluated using a parameter called COD.
COD stands for Chemical Oxygen Demand for the oxidation of substances dissolved and suspended in the water. By determining the COD it is possible to proportion chemically oxidable substances with energy oxidants such as potassium bichromate in a strongly acidic solution.
The acid environment is caused by the presence of concentrated sulphuric acid.
Both inorganic compounds and organic substances can be oxidized. This determination also makes it possible to proportion organic substances using the equivalent biological method (BOD: Biological Oxygen Demand), for example, cellulose.
Since oxidation takes place in drastic conditions, it is more complete than biological oxidation and as a consequence the COD value of a given sample is, in most cases, higher than the corresponding BOD value.

Thermoreaction (digestion) of a sample

The digestion of the sample is one of the most important steps in many chemical reactions. Digestion is carried out in order to convert low-solubility compounds or substances present in the form of aggregates into soluble compounds, to degrade organic substances into inorganic molecules, or to eliminate interfering substances and solubilize metallic ions. Digestion takes place by adding decomposition reagents to the sample which is then kept at a set temperature for a certain length of time.

ECO series thermoreactors

Velp Scientifica programmable thermoreactors are a cutting edge solution able to meet the most diversified temperature control requirements. Velp ECO thermoreactors have been studied for COD analysis in particular as well as for the wet-digestion preparation of samples for the determination of metallic and non-metallic elements in organic and inorganic materials such as minerals, alloys, animal feeds, soils, sediments and organic tissues.
The solutions Velp offers ensure a high degree of accuracy and reproducible results.
Velp Scientifica thermoreactors combine perfectly with Macherey-Nagel Nanocolor kits for analyzing parameters such as COD, nitrogen and total phosphorus, metals, hydrocarbons, AOX and TOC.

Velp Scientifica is, in fact, Macherey-Nagel's official partner for the Italian market.

Used in combination with the Macherey-Nagel Nanocolor kits for analyzing COD (COD 40, 60, 160 and 1500), Velp Scientifica thermoreactors have been given the stamp of approval as suitable for the ST-COD method "Determination of the chemical oxygen demand for water quality " in compliance with ISO 15705.

COD in 30 minutes!

Thanks to the newly introduced temperature of 160°C, the ECO series of thermoreactors are able to carry out COD analyses in just only 30 minutes.

Thermoreactors ECO Series

Description	ECO 6	ECO 8	ECO 16	ECO 25
Power supply	230V or 115V	230V -115V automatic voltage adjustment	230V or 115V	230V -115V automatic voltage adjustment
Power W	700	140	550	400
Dimensions (WxHxD) mm (in)	198x132x319 (7.8x5.2x12.6)	135x95x230 (5.3x3.7x9.1)	168x110x269 (6.6x4.3x10.6)	155x95x275 (6.1x3.7x10.8)
Weight Kg (lb)	5,6 (12,3)	2 (4,4)	3,8 (8,4)	3,6 (7,9)
Display	YES	–	YES	–
N° of samples	6 tubes of 200ml 18* test tubes Ø 16mm 6** test tubes Ø 22mm	8 test tubes Ø 16mm 1 test tubes Ø 22mm	14 test tubes Ø 16mm 2 test tubes Ø 22mm	25 test tubes Ø 16mm
Selectable Temperature	from room temp. to 200°C	70- 100-120-150-160°C	from room temp. to 160°C	70- 100-120-150-160°C
Selectable Time	up to 199 min or continuous	30 - 60- 120 or continuous	up to 199 min or continuous	30 - 60- 120 or continuous
Warning signal at the end of the work cycle with automatic switch-off	YES	YES	YES	YES

*with n° 6 cod. A00001044 (see pag. 9)
**with n° 6 cod. A00001046 (see pag. 9)

ECO 6

Technical Data

Selectable working temperatures: from room temperature to 200°C, resolution 1°C	
Selectable working times:	from 0 to 199 minutes or continuous operation
Holes number and diameter:	6 holes with ext. Ø 42 mm
Display visualization of the reached temperature and remaining time	
Acoustic signal at the end of the cycle with automatic switch-off	
Power:	700 W
Weight:	5,6 kg (12.3 lb)

Dimension (WxHxD): 198x132x319 mm (7.8x5.2x12.6 in)

Heating block technical data:

Temperature stability:	± 0,5°C
Temperature homogeneity:	± 0,5°C
Temperature precision:	± 0,5°C
Overtemperature safety	

Signals:

Reaching of set temperature:	visual signal
Count-down:	visual signal
End of cycle:	acoustic and visual signal
Probe interruption:	acoustic and visual signal
Broken probe:	acoustic and visual signal
Exceed temperature range:	acoustic and visual signal

The “Operating Accessories” indicated below are necessary for the correct functioning of the instrument

Instruments	Power supply	Code No
ECO 6	230 V / 50 – 60 Hz	F10100120
ECO 6	115 V / 50 – 60 Hz	F10110120

Operating Accessories	Code No
COD test tubes Ø 42x200ml with cone NS 29/32, 3 pcs/box	A00000145**
Air refrigerator with ground cone	A00001041*
Antisplash bell	A00001045*
PTFE sheat for 29/32 cones	A00001042*
Stainless steel handle for moving 6 test tubes Ø 42mm simultaneously	A00001043

*for the correct functioning of ECO for COD analysis 6 pieces are necessary
**for the correct functioning of ECO 2 boxes are necessary


A00000145

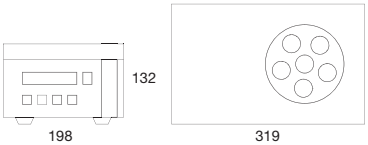
A00001041

A00001045


A00001042


A00001043

Optional Accessories	Code No
Anticorodal reducer Ø42 mm with 3 holes Ø 16 mm	A00001044
Anticorodal reducer Ø42 mm with 1 hole Ø 22 mm	A00001046



6-position thermoreactor for COD analysis

The ECO 6 thermoreactor is designed to analyze the COD of 6 20ml samples simultaneously, and for the wet digestion of samples in order to determine the metallic and non-metallic elements in organic and inorganic materials (metals, alloys, animal feeds, soils, sediments, tissues, etc.). The reaction time can be set from 1 to 199 minutes or to continuous mode and the temperature is controlled electronically (from room temperature to 200°C) with a high level of accuracy and reproducibility. The analysis is monitored constantly by means of the digital display which shows the temperature reached and the reaction time remaining.

The instrument can be equipped with a 3-place adapter (available upon request) allowing up to 18 test-tube analysis to be carried out simultaneously.

According to

EPA | APHA | AWWA | WEF


A00001044


A00001046

ECO 8 - ECO 25

Technical Data

Selectable working temperatures:	70, 100, 120, 150 and 160°C
Selectable working time: 30, 60, 120 min or continuous	
Holes number and diameter: 8 or 25 with ext. Ø 16mm For ECO 8:	1 hole ext. Ø 22mm (sludge analysis)
Display visualization of the reached temperature and remaining time	
Automatic adjustment of the voltage:	230V or 115V
Power ECO 8:	140W
Power ECO 25:	400W
Weight ECO 8:	2 kg (4.4 lb)
Weight ECO 25:	3,6 kg (7.9 lb)
Dimension (WxHxD) ECO8:	135x95x230 mm (5.3x3.7x9.1 in)
Dimension (WxHxD) ECO25:	155x95x275 mm (6.1x3.7x10.8 in)

Heating block technical data:

Temperature stability:	± 0,3°C
Temperature homogeneity:	± 0,3°C
Temperature precision:	± 0,3°C
Overtemperature safety	

Signals:

Reaching of set temperature :	acoustic and visual signal
Count-down:	visual signal
End of cycle:	acoustic and visual signal
Probe interruption:	acoustic and visual signal
Broken probe:	acoustic and visual signal
Exceed temperature range:	acoustic and visual signal

8- and 25-position thermoreactors for test-tube analysis with pre-set temperatures and times

The ECO 8 and ECO 25 thermoreactors are used to determine parameters such as COD and the nitrogenous and phosphorous compound content of test-tube samples. Safe and reliable conditions are ensured by the test-tube cover, the heating block shield and the safety thermostat. Five different working temperatures (70, 100, 120, 150 and 160°C) and working times (30, 60 and 120 minutes or continuous) can be set.
An acoustic signal indicates the end of the operating cycle with automatic switch-off.
The aluminum heating block offers optimum thermal homogeneity at all selected temperatures.
The heating block temperature is controlled by a PID logic microprocessor.

Instruments	Power supply	Code No
ECO 8	115 - 230 V / 50 – 60 Hz	F101A0127
ECO 25	115 - 230 V / 50 – 60 Hz	F101A0125

CA0091666

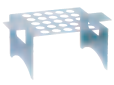
CA0091667

10001146

Accessories for sludge analysis	Code No
Test tube for sample decomposition 22 mm external diameter, NS 19/26 cone with glass cap	CA0091666*
Condenser 200 mm type KS with 3 meters polyethylene tube	CA0091667*
Absorption attachment for condenser NS 29/32	10001146*


CM0091680

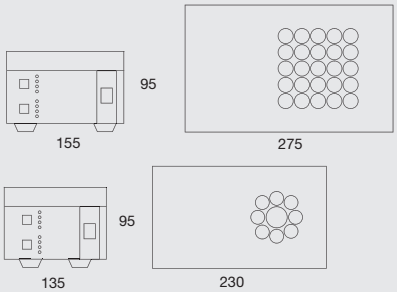

CA0091636


A00001039

Optional Accessories	Code No
Set of 20 glass test tubes with internal Ø 14 mm and external Ø 16 mm	CM0091680
Holder for 12 round glass cells	CA0091636
Test tube extractor	A00001039**

* only for ECO 8

** only for ECO 25



ECO 16

Technical Data

Selectable working temperatures: from room temperature to160°C, resolution 1°C	
Selectable working times:	from 0 to 199 minutes or continuous operation
Holes number and diameter:	14 with ext. Ø 16mm and 2 holes with ext. Ø 22mm (sludge analysis)
Acoustic signal at the end of the cycle with automatic switch-off	
Display visualization of the reached temperature and remaining time	
Power:	550W
Weight:	3.8 kg (8.4 lb)
Dimension (WxHxD): 168x110x269 mm (6.6x4.3x10.6 in)	

Heating block technical data:

Temperature stability:	±0,5°C
Temperature homogeneity:	±0,5°C
Temperature precision:	±0,5°C
Overtemperature safety	

Signals:

Reaching of set temperature:	visual signal
Count-down:	visual signal
End of cycle:	acoustic and visual signal
Probe interruption:	acoustic and visual signal
Broken probe:	acoustic and visual signal
Exceed temperature range:	acoustic and visual signal

16-position thermoreactor for test-tube analysis with temperature and time display

The ECO 16 thermoreactor is used to determine parameters such as COD and the nitrogenous and phosphorous compound content of test-tube samples. Safe and reliable conditions are ensured by the test-tube cover and safety thermostat.
The reaction time can be set from 1 to 199 minutes or to continuous mode and the temperature setting is shown on the display (from room temperature to 160°C).
An acoustic signal indicates the end of the operating cycle with automatic switch-off.
The aluminum heating block offers optimum thermal homogeneity at all selected temperatures.
The heating block temperature is controlled by a PID logic microprocessor.

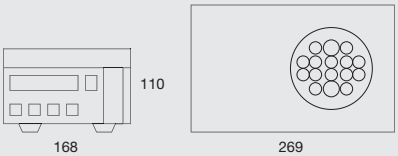
Instruments	Power supply	Code No
ECO 16	230 V / 50-60 Hz	F10100126
ECO 16	115 V / 50-60 Hz	F10110126

Accessories for sludge analysis	Code No
Test tube for sample decomposition 22 mm external diameter, NS 19/26 cone with glass cap	CA0091666
Condenser 200 mm type KS with 3 meters polyethylene tube	CA0091667
Absorption attachment for condenser NS 29/32	10001146

Optional Accessories	Code No
Set of 20 glass test tubes with internal Ø 14 mm and external Ø 16 mm	CM0091680
Holder for 12 round glass cells	CA0091636
Safety shield	A00001051

CA0091666 CA0091667 1001146

CA0091680 CA0091636 A00001051



BOD Analysis

WHAT IS BOD?

BOD (Biochemical Oxygen Demand) measures the amount of oxygen consumed by microorganisms in decomposing organic matter in wastewater or stream water.
The microorganisms contained in or inoculated into a sample of water containing a biodegradable organic substance consume oxygen owing to their metabolic activity and generate a corresponding volume of carbon dioxide.
By working in a closed system and forcing the carbon dioxide produced to be absorbed by a highly alkaline substance, a progressive reduction of the gas pressure is obtained. This pressure reduction can be measured using appropriate manometers.
The conventional incubation period at 20°C is currently considered to be 5 days and the BOD value obtained is called BOD5.
This value corresponds (with good reproducibility considering all the aspects of the technique) to 70% of what is known as BOD_{last} (the value obtained after total oxidation requiring 21-28 days).

Instruments for BOD analysis

In conformity with international regulations concerning the safety of workers and the safeguard of the environment, VELP Scientifica has developed an innovative ecological system (mercury-free) for determining the BOD with microprocessor using manometric technology.
Various solutions are available according to need.

Accessories for control tests

Water quality analysis calls for systematic research work and the accuracy and precision of the instruments used must be monitored constantly.
Velp offers two new accessories to support the analyst in carrying out control tests on Velp instruments:

- **BOD Sensor Check,** a device that carries out a quick test to check that the BOD Sensor is working properly.
Code No. A00000135.

- **Control Test Tablets** to check the correct functioning of the system and the calibration of the BOD Sensor's pressure sensor through a 5-day test.
Code No. A00000136.

BOD Sensor Check

Control Test Tablets

BOD Determination system

Description	BOD Sensor	BOD Sensor Set	BOD Sensor System 6	BOD Sensor System 10
Power supply	2 lithium batteries	2 lithium batteries	230V or 115V	230V or 115V
Power W	–	–	2	2
Dimensions (WxHxD) mm (in)	55x71x73 (2.1x2.8x2.9)	75x235 (3x9.3) (ØxH)	350x300x150 (13.8x11.8x6)	432x300x165 (17x11.8x6.5)
Weight Kg (lb)	0,08 (0.2)	0,4 (0.9)	2,3 (5.1)	3 (6.6)
Display	YES	YES	YES	YES
N° of samples	–	1	6	10
Scales	90, 250, 600, 999 ppm BOD	90, 250, 600, 999 ppm BOD	90, 250, 600, 999 ppm BOD	90, 250, 600, 999 ppm BOD
Memorizable data	5 BOD values every 24h	5 BOD values every 24h	5 BOD values every 24h	5 BOD values every 24h
Complete of	N°1 BOD Sensor	N°1 BOD Sensor, bottle, alkaly holder, stirring bar	6 places magnetic stirrer, with N° 6 BOD Sensor Set	10 places magnetic stirrer, with N° 10 BOD Sensor Set

NOTE: Available the traditional version BMS 6

BOD Sensor

Technical Data

Direct reading value in mg/l (ppm)	
Measurement by electronic pressure probe	
Memorized data:	5 BOD values at 24h intervals
BOD values (directly on the display) at any time also after the standard 5 days period.	
After BOD_5 is possibile to determine the BOD_{last}	
Scales:	90, 250, 600, 999 ppm BOD. Higher values after dilution.
Display:	digits 3 LED
Supply:	2 lithium batteries
Battery life:	2 years
Safety class:	3 IEC 1010
Electronic protection rating CEI EN 60529:	IP54
Weight:	0,08 kg (0.2 lb)
Dimension (WxHxD):	55x71x73 mm (2.1x2.8x2.9 in)

BOD Analysis

The BOD Sensor has an ergonomic structure designed and optimized to ensure ease of handling and reading.
It is manufactured using the most modern and advanced construction techniques and is fitted directly to the bottle containing the sample.
A microprocessor-controlled pressure transducer transfers the BOD value to the display.
The BOD Sensor automatically stores 5 BOD measurements at 24-hour intervals so that analysis can also be performed over weekends.
It is also possible to obtain a direct reading of the BOD value on the display at any time, even after five days. The BOD Sensor does not require any electrical connection.

According to

EPA | APHA | AWWA | WEF

Instruments	Code No
BOD Sensor	F102B0133

Complete of (for each BOD sensor)	Code No
2 lithium batteries type CR 2430	10000039
KOH trap	10000904

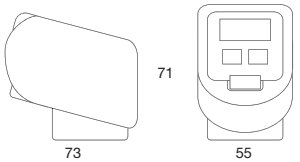
Optional Accessories	Code No
BOD Sensor Check	A00000135
Control Test Tablets (n°8 tablets / box)	A00000136


10000039


10000904


A00000135


A00000136



BOD Sensor Set

Technical Data

Direct reading value in mg/l (ppm)	
Measurement by electronic pressure probe	
Memorized data:	5 BOD values at 24h intervals
BOD values (directly on the display) at any time also after the standard 5 days period.	
After BOD_5 is possible to determine the BOD_{last}	
Scales:	90, 250, 600, 999 ppm BOD Higher values after dilution
Display:	LED 3 digits
Bottle total capacity:	500 ml
Supply:	2 lithium batteries
Battery life:	2 years
Safety class:	3 IEC 1010
Electronic protection degree CEI EN 60529:	IP54
Weight:	0,4 Kg (0.9 lb)
Dimension (WxH):	75x235 mm (3x9.3 in)

Set for a single BOD analysis

The BOD Sensor Set is made up of the BOD Sensor, a bottle, an alkali holder to absorb the carbon dioxide and a stirring bar.
This simple configuration was designed to meet the demands of those laboratories that carry out individual analysis only.
Use with the Velp MST stirrer is recommended (code F20300160).

Instruments	Code No
BOD Sensor Set	F102B0134

Complete of	Code No
2 lithium batteries CR 2430	10000039
KOH trap	10000904
Dark glass 500 ml bottle	10001107
Magnetic stir bar 6x35 mm	A00001056

Optional Accessories	Code No
BOD Sensor Check	A00000135
Control Test Tablets (n°8 tablets /box)	A00000136


10000039


10000904


10001107

A00001056


A00000136


A00000135

BOD Sensor System 6/10

Technical Data

BOD Sensor System 6

See BOD Sensor Set technical data	
Power:	2 W
Weight:	2,3 Kg (5.1 lb)
Dimension (WxHxD):	350x300x150 mm (13.8x11.8x6 in)

BOD Sensor System 10

See BOD Sensor Set technical data	
Power:	2 W
Weight:	3 Kg (6.6 lb)
Dimension (WxHxD):	432x300x165 mm (17x11.8x6.5 in)

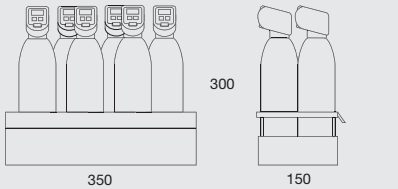
Complete system for BOD analysis

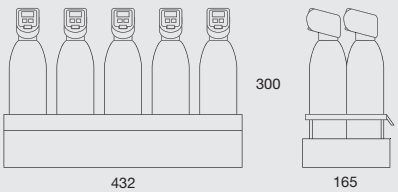
BOD Sensor Systems 6 and 10 consist of a 6 or 10-position stirring unit complete with 6 or 10 BOD Sensors, 6 or 10 alkali holders for absorbing the carbon dioxide and 6 or 10 stirring bars.
The instrument represents a complete solution for the user. It is immediately operational for measuring the BOD on 4 scales - 90, 250, 600 and 999 ppm BOD - higher values can also be measured by diluting the sample. The sample quantity to be examined varies from 100 to 400 ml, the bottle's total capacity is 500 ml.
The compact, easy-to-handle design means that 6 or 10 BOD bottles can be housed in a small amount of space. The two built-in handles ensure easy and safe handling when removing or replacing the equipment in the refrigerated thermostat even when the bottles are already in place. The instrument features a stirring system offering non-stop operation without the risk of shut-off or overheating.

Instruments	Power supply	Code No
BOD Sensor System 6	230 V / 50 Hz	F10220136
BOD Sensor System 6	230 V / 60 Hz	F10230136
BOD Sensor System 6	115 V / 60 Hz	F10240136
BOD Sensor System 10	230 V / 50 Hz	F10220137
BOD Sensor System 10	230 V / 60 Hz	F10230137
BOD Sensor System 10	115 V / 60 Hz	F10240137

Complete of (for each BOD Sensor)	Code No
2 lithium batteries CR 2430	10000039
KOH trap	10000904
Dark glass 500 ml bottle	10001107
Magnetic stir bar 6x35 mm	A00001056

Optional Accessories	Code No
BOD Sensor Check	A00000135
Control Test Tablets (n°8 tablets /box)	A00000136





BMS 6

Technical Data

Power:	2W
Weight:	7Kg (15.4 lb)
Dimension (WxHxD):	350x360x210 mm (13.8x14.2x8.3 in)

Solution for traditional BOD analysis

Equipment for determining the BOD using the traditional manometric technique up to 1000 mg/l (ppm); higher values are determined after dilution.
6 bottles can be housed simultaneously.
Each position is equipped with bottle, manometer and 4 scales for readings of up to 90, 250, 600 and 1000 ppm BOD.
The sample quantity to be examined varies from 100 to 400 ml, and the bottle's total capacity is 500 ml. The samples are continuously stirred by a magnetic stirrer with 6 or 10 positions.

Instruments	Power supply	Code No
BMS 6	230 V / 50 Hz	F10220131
BMS 6	230 V / 60 Hz	F10230131
BMS 6	115 V / 60 Hz	F10240131

Complete of	Code No
6 dark glass 500 ml bottles	10001107*
6 KOH trap	10000904*
6 mercury (2 ml bottles)	40000043*
6 magnetic stirring bars 6x35 mm	A00001056*

* the code is referred to a single piece

Optional Accessories	Code No
Control Test Tablets (n°8 tablets /box)	A00000136

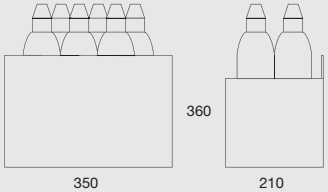

10001107


10000904


40000043

A00001056


A00000136

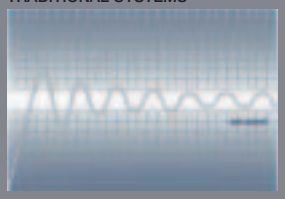


Refrigerated Thermostats

Innovative Auto-Tuning System

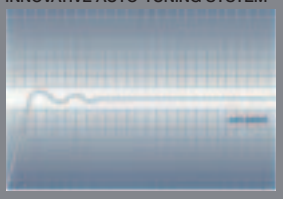
Thanks to the Auto-Tuning thermoregulation system, Velp Scientifica refrigerated thermostats and incubators ensure that optimum thermal homogeneity and stability at all set temperatures are achieved.
The internal temperature of the refrigerated thermostats and incubators is constantly controlled by the software, which continuously compares the detected and set values and aligns them by means of a PRECISE AND RAPID ALIGNMENT SYSTEM specially developed by Velp.

TRADITIONAL SYSTEMS



Extended temperature oscillations before reaching the set value

INNOVATIVE AUTO-TUNING SYSTEM

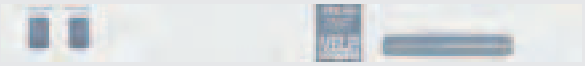


Rapid alignment of the temperature with the set value with minimum oscillations

VELP INCUBATOR SOFTWARE

The dedicated VELP Incubator software lets you interface all of the refrigerated thermostats ("E" series) and all incubators (“I” series) with a PC by way of an RS232 serial connection.
This makes it possible to:
- Manage remote control of the refrigerated thermostat by setting the set point and the minimum and maximum temperature alarm thresholds;
- Instantly view the trend of the internal temperature on a graph;
- Automatically record the temperature trend on a spreadsheet;
- Set working ramps with different temperatures and times;
- View and record any alarms;
- Enter all of the test data into the file in conformity with the G.L.P. (Good Laboratory Practices).

Refrigerated Thermostats and Cooled Incubators



FTC 90
Electronic temperature control ensures a constant temperature of 20°C, the internal temperature is displayed on an external thermometer. Optimum stability and homogeneity of the internal temperature. Usable internal volume 64 liters.

FTC 90E - FTC 90I
The temperature can be set from 3 to 50°C, temperature setting and display have 0.1°C precision, AUTO-TUNING electronic thermoregulation system. Usable internal volume 64 liters.

FOC 225E - FOC 225I
The temperature can be set from 3 to 50°C, temperature setting and display have 0.1°C precision, AUTO-TUNING electronic thermoregulation system. Usable internal volume 196 liters.

Refrigerated thermostats and cooled incubators

Description	FTC 90	FTC 90E	FTC 90I	FOC 225E	FOC 225I
Power supply	230V	230V	230V	230V	230V
Power W	150	250	250	350	350
Dimensions (WxHxD) mm (in)	550x590x600 (21.6x23.2x23.6)	550x590x600 (21.6x23.2x23.6)	550x590x600 (21.6x23.2x23.6)	540x1300x560 (21.3x51.2x22)	540x1300x560 (21.3x51.2x22)
Weight Kg (lb)	24.5 (53.9)	29 (63.8)	30 (66)	40 (88)	40,5 (89)
Total volume (liters)	90	90	90	207	207
Usable internal volume (liters)	64	64	64	196	196
Display	–	YES	YES	YES	YES
Temperature range °C	20 fixed value	from 3,0 to 50,0	from 3,0 to 50,0	from 3,0 to 50,0	from 3,0 to 50,0
Internal Temperature stability °C	± 0,5	± 0,5	± 0,5	± 0,5	± 0,5
Auto-tuning electronic thermoregulation	–	YES	YES	YES	YES
Internal electrical current socket	1	1	1	2	2
RS232 port	–	YES	YES	YES	YES
Transparent internal door	–	–	YES	–	YES
Number of shelves included	1	1	1	4	4
Max number of shelves	1	1	1	12*	12*

* Distance of 40 mm between one shelf and the next

FTC 90

Technical Data

Total volume:	90 liters
Internal usable volume:	64 liters
Temperature electronic regulation at the constant value:	20°C ± 0,5°C
1 internal electrical current socket	
Number of shelves included:	1
Max number of shelves:	1
Power:	150W
Weight:	24.5 Kg (53.9 lb)
Dimension (WxHxD):	550x590x600 mm (21.6x23.2x23.6 in)

Refrigerated thermostat with pre-set temperature

Small refrigerated thermostat specially designed for incubating BOD measuring units.
6- or 10-position instruments can be incubated and can be powered thanks to an internal socket controlled by a special external switch situated on the control panel.
Forced air circulation ensures a uniform temperature inside the incubation chamber.

Instruments	Power supply	Code No
FTC 90	230 V / 50 Hz	F10300140

Complete of	Code No
Shelf	10001076

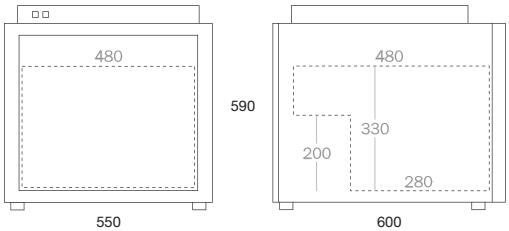
Optional Accessories	Code No
IQ/OQ Manual FOC 225/FTC 90	A00000076

10001076

A00000076

NO CFC

The FTC90 is CFC-free (Chloro Fluoro Carbons), meeting environmental regulations.



FTC 90E

Technical Data

Total volume:	90 liters
Usable internal volume:	64 liters
Temperature range:	from 3,0 to 50,0°C
Internal temperature stability:	± 0,5°C
Internal temperature homogeneity:	± 0,5°C
Internal temperature shown by a display	
Temperature resolution:	0,1°C
Electronic thermoregulation system:	AUTO - TUNING
1 internal electrical current socket	
Number of shelves included:	1
Max number of shelves:	1
Power:	250W
Weight:	29 Kg (63.8 lb)
Dimension (WxHxD):	550x590x600 mm (21.6x23.2x23.6 in)

FTC 90E refrigerated thermostat with variable temperature

Refrigerated thermostat equipped with the innovative AUTO-TUNING thermoregulation system.
The internal temperature is controlled by software that constantly checks the selected temperature and intervenes to keep the temperature precisely aligned with every Set Point value.
The special microprocessor-controlled electronic System and forced air circulation ensure excellent stability and homogeneity of the internal temperature (3-50°C) with units of 0.1°C. The real internal temperature is shown on the display.
The refrigerated thermostat can be used to keep any product at a constant temperature and to incubate equipment for determining the BOD. It is possible to incubate a 6- or 10-position instrument which can be powered thanks to an internal socket controlled by a special external switch situated on the control panel.
The refrigerated thermostat can be connected to a PC using an RS232 connector for use with dedicated software.

Instruments	Power supply	Code No
FTC 90E	230 V / 50 Hz	F10300143

Complete of	Code No
Shelf	10001076

Optional Accessories	Code No
Connecting cable for RS232 interface	A00000005
Software Incubator	A00000020
IQ/OQ Manual FOC 225/FTC 90	A00000076


A00000005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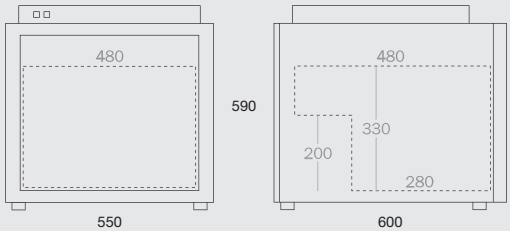
NO CFC

The FTC 90E is CFC-free (Chloro Fluoro Carbons), meeting environmental regulations.



FOC 225E

Technical Data

Total volume:	207 liters
Usable internal volume:	196 liters
Temperature range:	from 3,0 to 50,0°C
Internal temperature stability:	± 0,5°C
Internal temperature homogeneity:	± 0,5°C
Internal temperature shown by a display	
Temperature resolution:	0,1°C
Electronic thermoregulation system:	AUTO - TUNING
2 internal electrical current sockets	
Number of shelves included:	4
Max number of shelves:	12 (distance of 40 mm between one shelf and the next)
Power:	350W
Weight:	40 Kg (88 lb)
Dimension (WxHxD):	540x1300x560 mm (21.3x51.2x22 in)

FOC 225E refrigerated thermostat with variable temperature

Refrigerated thermostat equipped with the innovative AUTO-TUNING thermoregulation system.
The internal temperature is controlled by software that constantly checks the selected temperature and intervenes in order to keep the temperature precisely aligned with every Set Point value. The special microprocessor-controlled electronic system and forced air circulation ensure excellent stability and homogeneity of the internal temperature (3-50°C) with units of 0.1°C.
The real internal temperature is shown on the display.
The refrigerated thermostat can be used to keep any product at a constant temperature and to incubate equipment for determining the BOD. It is possible to incubate three instruments in the 6- or 10-position version.
2 internal sockets controlled by an external switch on the control panel are available.
The refrigerated thermostat can be connected to a PC using an RS232 connector for use with dedicated software.

NO CFC

The FOC 225E is CFC-free (Chloro Fluoro Carbons), meeting environmental regulations.

Instruments	Power supply	Code No
FOC 225E	230 V / 50 - 60 Hz	F10300141

Complete of	Code No
Shelf	10001074*

Optional Accessories	Code No
Connecting cable for RS232 interface	A00000005
Incubator Software	A00000020
Shelf	10001074
IQ/OQ Manual FOC 225/FTC 90	A00000076

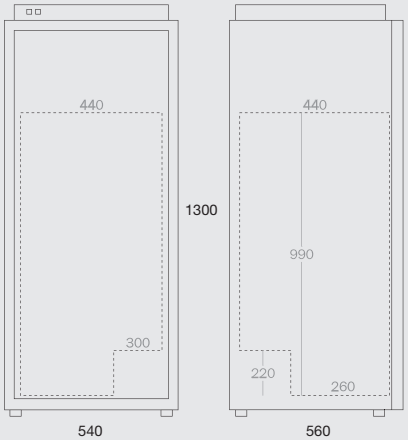
*4 shelves included


A00000005


A00000020

10001074


A00000076



FTC 90l

Technical Data

Total volume:	90 liters
Usable internal volume:	64 liters
Transparent internal door	
Temperature range:	from 3,0 to 50,0°C
Internal temperature stability:	± 0,5°C
Internal temperature homogeneity:	± 0,5°C
Internal temperature shown by a display	
Temperature resolution:	0,1°C
Electronic thermoregulation system:	AUTO - TUNING
1 internal electrical current socket	
Number of shelves included:	1
Max number of shelves:	1
Power:	250W
Weight:	30 Kg (66 lb)
Dimension (WxHxD):	550x590x600 mm (21.6x23.2x23.6 in)

FTC 90l cooled incubator with transparent internal door

Cooled incubator with transparent internal door allowing visual examination of the contents.
The internal chamber is condensation-free and boasts excellent temperature stability.
Can be used to keep any sample at a constant and precise temperature.
Continuous ventilation and the special microprocessor-controlled AUTO-TUNING thermoregulation system ensure temperature uniformity in all points inside the chamber.
The selected temperature is constantly monitored in order to keep the temperature precisely aligned with every Set Point value. Digital temperature programming and display.
Can be connected to a PC using an RS232 connector for use with dedicated software.

Instruments	Power supply	Code No
FTC 90l	230 V / 50 Hz	F10400143

Complete of	Code No
Shelf	10001076

Optional Accessories	Code No
Connecting cable for RS232 interface	A00000005
Incubator Software	A00000020
IQ/OQ Manual FOC 225/FTC 90	A00000076


A00000005

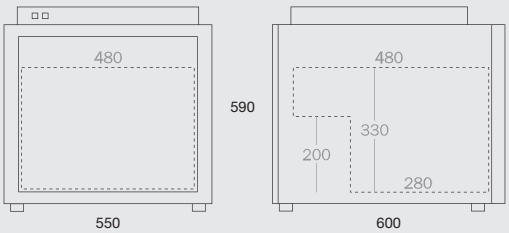

A00000020

10001076


A00000076

NO CFC

The FTC 90l is CFC free (Chloro Fluoro Carbons), meeting environmental regulations.



FOC 225I

Technical Data

Total volume:	207 liters
Usable internal volume:	196 liters
Transparent internal door	
Temperature range:	from 3,0 to 50,0°C
Internal temperature stability:	± 0,5°C
Internal temperature homogeneity:	± 0,5°C
Internal temperature shown by a display	
Temperature resolution:	0,1°C
Electronic thermoregulation system:	AUTO - TUNING
2 internal electrical current sockets	
Number of shelves included:	4
Max number of shelves:	12 (distance of 40 mm between one shelf and the next)
Power:	350W
Weight:	40 Kg (88 lb)
Dimension (WxHxD):	540x1300x560 mm (21.3x51.2x22 in)

Instruments	Power supply	Code No
FOC 225I	230 V / 50 – 60 Hz	F10400141

Complete of	Code No
Shelf	10001074*

Optional Accessories	Code No
Connecting cable for RS232 interface	A00000005
Incubator Software	A00000020
Shelf	10001074
IQ/OQ Manual FOC 225/FTC 90	A00000076

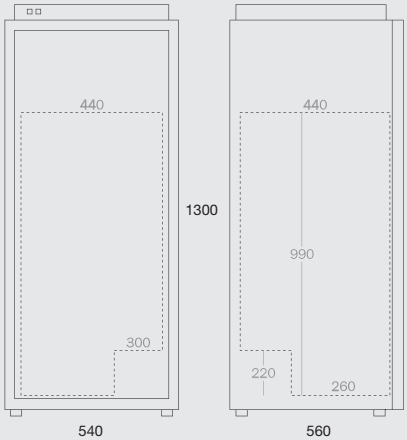
*4 shelves included


A00000005


A00000020

10001074


A00000076



FOC 225I cooled incubator with transparent internal door

For various laboratory uses: incubating cultures of microorganisms, storing samples, determining enzymatic activity and all uses where a product must be kept at a constant and precise temperature.
Continuous ventilation and the special microprocessor-controlled AUTO-TUNING thermoregulation system ensure temperature uniformity in all points inside the chamber with continuous monitoring of the room temperature so the Set Point set is kept precisely aligned.
The internal temperature is programmed and displayed digitally from 3 to 50°C (stability ±0.5°C) with units of 0.1°C.
Can be connected to a PC using an RS232 connector for use with dedicated software.

NO CFC

The FOC 225I is CFC free (Chloro Fluoro Carbons), meeting environmental regulations.

Flocculators

"JAR TEST" AND "LEACHING TEST"

JAR TEST

The type of chemical coagulant to be adopted for removing suspended solids from wastewater and the dosage required are established based on laboratory results obtained from the so-called Jar Test. Multiple stirrers with reproducible stirring speeds mean standard test conditions can be adopted, a basic requirement in order to obtain reliable results.
Due to constant variations in the contents of water the test should be repeated with a frequency dictated by specific needs.

LEACHING TEST

This is a test run on solid wastes to be sent to the dump that uses diluted acetic acid or carbon dioxide-saturated water in order to detect the presence of toxic heavy metals.

Flocculators

Description	JLT4	JLT6	FC4S	FC6S	FP4
Power supply	100 - 240V	100 - 240V	100 - 240V	100 - 240V	100 - 240V
Power W	11	11	18	23	6
Dimensions mm (WxHxD) (in)	645x347x260 (25.4x13.7x10.2)	935x347x260 (36.8x13.7x10.2)	645x347x260 (25.4x13.7x10.2)	935x347x260 (36.8x13.7x10.2)	250x320x250 (9.8x12.6x9.8)
Weight Kg (lb)	13 (28.6)	17 (37.4)	12,5 (27.5)	18 (39.6)	4,8 (10.6)
Stirring rods	4	6	4	6	4
Stirring volume for each rod (liters)	1	1	1	1	1
Speed selector	Monoselector (same speed for each rod)	Monoselector (same speed for each rod)	Pluriselector (settable speed for each rod)	Pluriselector (settable speed for each rod)	Monoselector (same speed for each rod)
Settable speed rpm	from 10 to 300	from 10 to 300	9 speeds: (10-15-30-45-60-90-120-150-200)	9 speeds: (10-15-30-45-60-90-120-150-200)	5 speeds: (20-40-50-100-200)
Speed resolution rpm	±1	±1	±2	±2	±2
Timer	YES	YES	–	–	YES
Lighted back panel	YES	YES	YES	YES	YES
Display	YES	YES	–	–	–

JLT 4 - JLT 6

Technical Data

Epoxy painted metal structure	
Disconnectable lighted back panel	
Stainless steel stirring rods adjustable in height by a self blocking chuck	
DC gear motor	
Settable speed from 10 to 300 rpm, resolution 1 rpm, microprocessor controlled	
Microprocessor controlled timer: 0 ÷ 999 min or 0 ÷ 99 hours (or continuous)	
Power JLT4: Power JLT6:	11W 11W
Weight JLT4: Weight JLT6:	13 kg (28.6 lb) 17 kg (37.4 lb)
Dimension (WxHxD) JLT4:	645x347x260 mm (25.4x13.7x10.2 in)
Dimension (WxHxD) JLT6:	935x347x260 mm (36.8x13.7x10.2 in)

The JLT 4 and JLT 6 are supplied with switching power supply and European plug.

Flocculators

The JLT4 and JLT6 (4- and 6-positions respectively) flocculators are designed both for optimizing the dosing of coagulants for separating pollutants in wastewater treatment plants thanks to the laboratory results obtained using the so-called Jar Test, and for running toxic substance leaching tests on solid wastes to be sent to the dump.
The multiple stirrers with reproducible stirring speeds allow standard conditions for the tests to be adopted, a basic requirement in order to obtain reliable results.
The sample being examined can be backlit using a special switch found on the front panel making for easier readings.
The instruments have an ergonomic design and the control panel is tilted for easier parameter settings and readings.
The rotation speed can be programmed from 10 to 300 rpm with 1 rpm intervals and the time remaining can be set to hours or minutes.

Instruments	Power supply	Code No
JLT4	100-240 V / 50 – 60 Hz	F105A0108
JLT6	100-240 V / 50 – 60 Hz	F105A0109

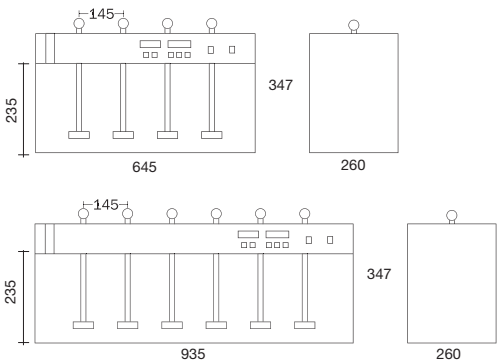
Interchangeable Plug	Code No
US Plug	10003722
UK Plug	10003723
Australian Plug	10003724

Optional Accessories	Code No
Glass beaker 1000 ml	A00001001
Plastic beaker 1000 ml	A00001000
Transparent plastic Imhoff cone	A00001002
Glass graduated Imhoff cone	A00001003
Stand for 2 Imhoff cones	A00001004


A00001000 A00001001 A00001002


A00001003 A00001004


10003722 10003723 10003724



FC4S - FC6S

Technical Data

Epoxy painted metal structure	
Disconnectable lighted back panel	
Stainless steel stirring rods adjustable in height by a self blocking chuck	
DC gear motor for each stirrer	
Individual speed selector for each stirrer	
Speed selector settable at 10 - 15 - 30 - 45 - 60 - 90 - 120 - 150 - 200 rpm (possible up to 300 rpm)	
Power FC4S: Power FC6S:	18W 23W
Weight FC4S: Weight FC6S:	12,5 kg (27.5 lb) 18 kg (39.6 lb)
Dimension (WxHxD) FC4S:	645x347x260 mm (25.4x13.7x10.2 in)
Dimension (WxHxD) FC6S:	935x347x260 mm (36.8x13.7x10.2 in)

Flocculators

The FC4S and FC6S (4- and 6-position) flocculators have a metal structure coated with epoxy paint specially formulated to make the instruments highly resistant to chemical and mechanical aggression, and corrosion in general.
The sample being examined can be backlit using a special switch found on the front panel for easier readings.
The stainless steel stirring shafts are adjustable in height and are equipped with a self-locking device with clutch.
Motion is transmitted by four or six direct current gear motors that make it possible to achieve optimum performance and reproducibility, even at low speeds.
FC4S and FC6S have 9 different speed settings for each position; the stirring speed can be set using the selectors on the front panel (10 – 15 – 30 – 45 – 60 – 90 – 120 – 150 – 200 rpm).

The FC4S and FC6S are supplied with switching power supply and European plug.

Instruments	Power supply	Code No
FC4S	100 – 240 V / 50 – 60 Hz	F105A0111
FC6S	100 – 240 V / 50 – 60 Hz	F105A0112

Interchangeable Plug	Code No
US Plug	10003722
UK Plug	10003723
Australian Plug	10003724

Optional Accessories	Code No
Glass beaker 1000 ml	A00001001
Plastic beaker 1000 ml	A00001000
Transparent plastic Imhoff cone	A00001002
Glass graduated Imhoff cone	A00001003
Stand for 2 Imhoff cones	A00001004


A00001000

A00001001


A00001002

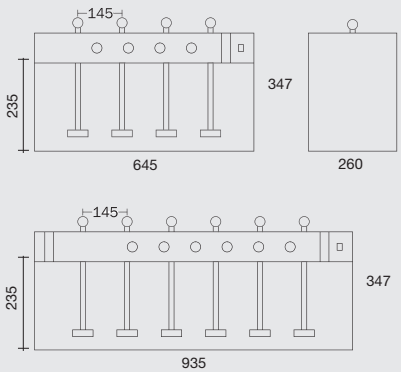

A00001003


A00001004


10003722


10003723


10003724



FP4

Technical Data

Epoxy painted metal structure	
Disconnectable central lighted	
Stainless steel stirring rods adjustable in height by a self blocking chuck	
DC gear motor	
Common speed selector to all stirring rods	
Timer from 0 to 30 minutes (or continuous)	
Speed selector settable at 20 - 40 - 50 - 100 - 200 rpm	
Power:	6W
Weight:	4,8 Kg (10.6 lb)
Dimension (WxHxD) :	250x320x250 mm (9.8x12.6x9.8 in)

Portable flocculator

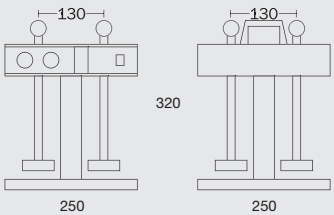
The FP4 (4-position) portable flocculator was developed for optimum use in the field. It runs on 100-240V mains power supply or using 12 DC by connecting it to a normal battery or a car cigarette lighter.
The FP4 features a non-slip base that ensures the stability of the beakers during operation.
It is particularly suitable for carrying out Jar Tests for optimizing the dosing of coagulants and polyelectrolyte in the proximity of water treatment plants.

The FP4 is supplied with switching power supply and European plug.

Instruments	Power supply	Code No
FP4	100 – 240 V / 50 – 60 Hz	F105A0117

Interchangeable Plug	Code No
US Plug	10003083
UK Plug	10003084
Australian Plug	10003085

Optional Accessories	Code No
Glass beaker 1000 ml	A00001001
Plastic beaker 1000 ml	A00001000
Carrying case	A00001005



ROTAX 6.8

Technical Data

Number of bottles that equipment can hold: 6 bottles 2 liter or 8 bottles 1 liter with an adapter	
Electronic control of speed rotation from 0 to 30 rpm, resolution 1rpm	
Display :	LCD
Bottle maximum height:	270 mm
Bottle minimum height:	205 mm
Bottle maximum diameter (2l):	135 mm
Power:	100W
Weight:	30 kg (66 lb)
Dimension (WxHxD):	665x520x470 mm (26.2x20.5x18.5 in)

Overhead mixer

ROTAX 6.8 can be used for all applications where mixing by overturning is required.
The instrument is designed for evaluating the solubility of pollutants, sludge, sediments and solid wastes in water.

Standards:
The ROTAX 6.8 Overhead mixer complies to DIN 38414 and UNI 10802.

Instruments	Power supply	Code No
ROTAX 6.8	230 V / 50 – 60 Hz	F10600118
ROTAX 6.8	115 V / 50 – 60 Hz	F10610118

Optional Accessories	Code No
Complementary part holding eight 1 liter bottles (n° 2 pieces)	A00001023
Polyethylene bottle, 2 liters	A00001021
Glass bottle with round glass cap, 2 liters	A00001024
Polyethylene bottle, 1 liter	A00001022

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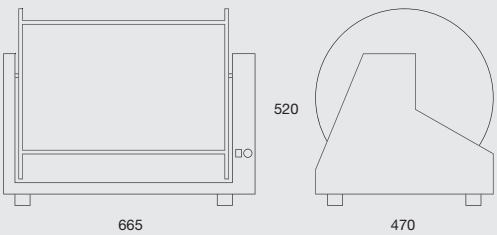


TMD 6

Technical Data

Weight:	5 kg (11 lb)
Dimension (WxHxD):	225x810x126 mm (8.9x31.9x5 in)

Mineralization system for heavy metals trace determination

These units are designed for digestion using “aqua regia” (king’s water) of sludge coming from water treatment plants, soil, compost, wastewater or vegetable matter in accordance with DIN 38414.

Hot mineralization for the determination of mercury, cadmium, lead, chromium, copper, zinc, etc. is carried out without loss using water jacketed condensers.

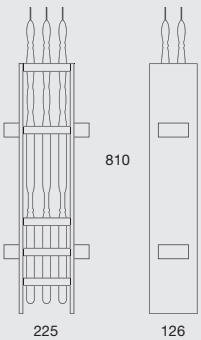
TDM 6 has to be completed with the DK6 to perform the digestion of the sample.

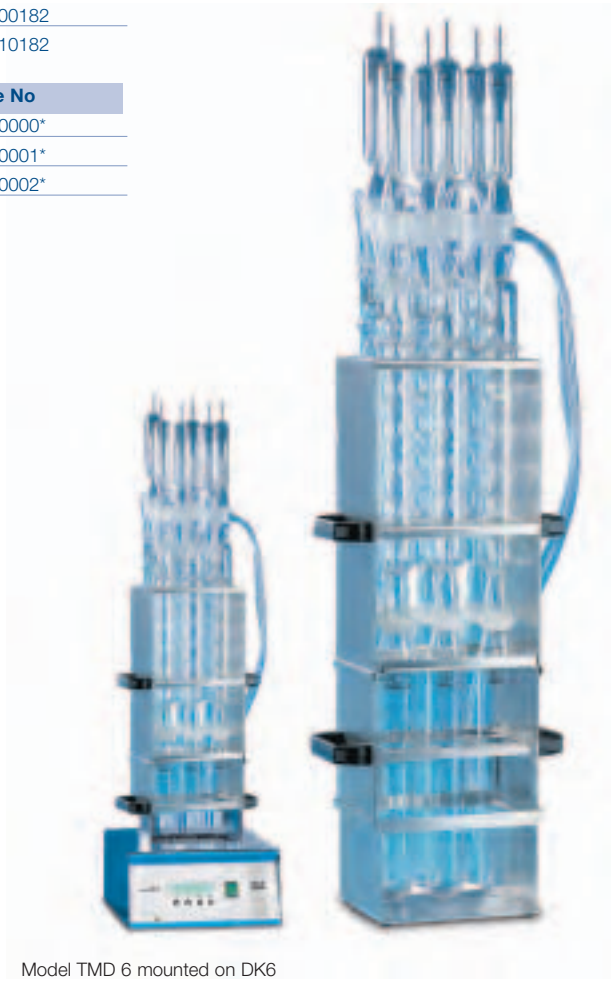
Instruments	Power supply	Code No
TMD 6	No supply	F107C0146
DK 6 digester for TMD 6 places group	230 V / 50 – 60 Hz	F30100182
DK 6 digester for TMD 6 places group	115 V / 50 – 60 Hz	F30110182

TMD 6 complete of	Code No
Test tube Ø 42x300 mm spherical joint	10000000*
Allihn condenser	10000001*
Absorption attachment for condenser	10000002*

*n°6 pieces included

10000000 10000001 10000002





Model TMD 6 mounted on DK6

TB1

Technical Data

Measurement method:	ISO 7027 compliant nephelometric method (90°)
Measurement range:	from 0 to 1000 NTU
Accuracy:	±2% in the range from 0 to 500 NTU ± 3% in the range from 501 to 1000 NTU
Calibration Standard:	0.02, 20, 100, 800 NTU
Repeatability:	± 0.01 NTU or ± 1% of reading, whichever is greater with gel samples
Light source: Infrared emitting-diode (850 nm wavelenght)	
Protection degree CEI EN 60529:	IP 67
Supply:	4x1,5V alcaline battery
Weight:	0,2 Kg (0.4 lb)
Dimension (WxHxD):	68x50x155 mm (2.7x2x6.1 in)

Turbidimeter

The portable turbidimeter TB1 measures the turbidity of aqueous samples simply and accurately providing results directly in Nephelometric Turbidity Units (NTU).
The high quality, ease of use and total impermeability of the TB1 turbidimeter make this instrument unique and of great interest for those working in the water analysis sector.

The instrument can be calibrated simply and quickly using just a few keys: within a few seconds the information required concerning the standard and the sample to be analyzed is displayed.

The TB1 is supplied complete with sets of 4 calibration standards (800, 100, 20 and 0.02 NTU), NIST traceable; 3 vials, cloth, silicone oil, batteries and carrying case.

	JCU	NTU= FTU	Silica
JCU	1	19	2.5
NTU=FTU	0.053	1	0.13
Silica	0.4	7.5	1

JCU Jackson candle unit
FTU Formazine turbidity units (Hydrazine sulphate + examethylen tetramine)
SILICA Silica units (mg/l SiO_2)

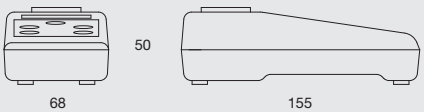
Instruments	Code No
TB1	R109B12150

Complete of	Code No
Calibration set (includes standard 800, 100, 20.0 and 0.02 NTU)	CE0012020
Sample Vials – pack of 3 vials	CE0012030
Silicone oil – 10 ml	CE0012050


CE0012020


CE0012030


CE0012050



Radiation detector

Technical Data

Range:	0,5 - 5,0 - 50 mR/h; 500 - 5000 - 50000 CPM; 5 - 50 - 500 ∝Sv/h

Sensitivity

α: detected down to 2,5 MeV, with typical detection efficiency greater than 80% at 3,5 MeV

β: detected at 150 keV with 75% typical detection efficiency

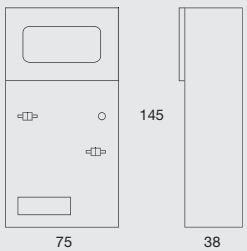
Gamma and X rays typically detected down to 10 keV through the end window and to 40 keV through the case

Supply:	9 V alcaline battery, 2000 hours lifetime
Weight:	0,25 kg (0.6 lb)
Dimension (WxHxD):	75x145x38 mm (2.9x5.7x1.5 in)

Radiation detector

This detector is an industrial standard model of a Geiger-Müller tube with a thin mica output window.
It is factory-calibrated using a pulse generator and is typically ±15% of the full scale relative to Cesium137.
It carries out detections in milliroentgens/hour and in events/minute (cpm) in three different measurement intervals. The unit is protected by an antisaturation circuit up to a value equivalent to 100 times the maximum reading in the greatest interval. Radiation detection is indicated by the hand moving on the graduated scale, a blinking LED and an audible beeper.

Instrument	Code No
Radiation detector	R10800340




VELP
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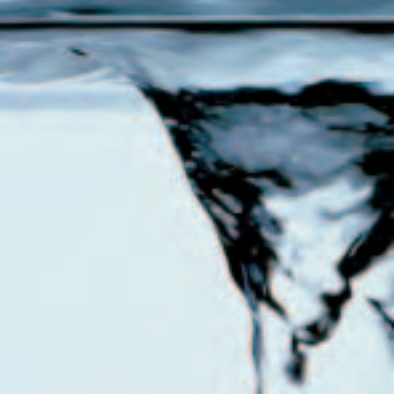

Stirring Line

In a constantly evolving scientific world, research is in need of increasingly stricter controls to be carried out with reliable equipment that offers accurate and precise testing conditions. Velp is devoted to providing solutions for these needs starting with the basic instruments essential for the analyst's job: stirrers.
Velp stirring systems are built in conformity with the international design and safety regulations for protecting the operator and the environment. They are made using the best components on the market and innovative construction techniques while at the same time remaining simple to use.

Index

Heating magnetic stirrers

Heating magnetic stirrers are laboratory solutions widely used in all biological and chemical laboratories for various applications.
VELP Scientifica offers a wide range of solutions, with single-place or multi-place heating plate, suited to different stirring volume capacities and provided with the highest safety standards.
The heating magnetic stirrers VELP offers are solutions that are versatile and reliable over the years.

VELP COMPOSED MAGNET

The Velp composed magnet's original geometric configuration together with the choice of materials used give the magnet a greater force of attraction in any working condition with self-centering of the stirring bar, whether it is small or large in size.
In fact, unlike other similar products used in laboratory equipment, the magnet is able to concentrate the energy of the magnetic field and hence create a greater force of attraction, totally vibration-free.

Description	ARE	AREX	ARED	T.ARE	AREC	AM4
Power supply	230V or 115V	230V or 115V	230V or 115V	230V or 115V	230V or 115V	230V
Power W	630	650	900	900	800	2550
Dimensions mm (WxHxD) (in)	165x115x280 (6.5x4.5x11)	165x115x280 (6.5x4.5x11)	190x110x245 (7.5x4.3x9.6)	190x110x245 (7.5x4.3x9.6)	207x84x312 (8.1x3.3x12.3)	715x115x220 (28.1x4.5x8.7)
Weight Kg (lb)	2.9 (6.4)	2.9 (6.4)	3.1 (6.8)	3.1 (6.8)	3.5 (7.7)	8.3 (18.2)
Stirring speed rpm	10-1200	10-1300	10-1200	10-1200	10-1300	10-1200
Max temperature °C	370	370	370	370	540	370
Stirring volume max (H_2O liters)	15	20	25	25	15	5 (x4)
Heating plate dimensions mm	Ø 155	Ø 155	Ø 180	Ø 180	200x200	Ø 155
Protection class CEI EN 60529	IP 42	IP 42	IP 21	IP 21	IP 42	IP 21
Counter-reaction*	–	YES	–	–	YES	–

*counter-reaction: constant speed even when the viscosity changes

ARE

Technical Data

Aluminum casted structure with an epoxy paint purposely studied that ensures an excellent resistance to chemicals and mechanical agents.	
Electronic speed control:	up to 1200 rpm
High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation	
Temperature regulation:	from room temp. to 370°C
Heating plate diameter:	155 mm
Stirring volume (H2O):	up to 15 liters
Protection rating CEI EN 60529:	IP42
Power:	630W
Weight:	2,9 kg (6.4 lb)
Dimension (WxHxD):	165x115x280 mm (6.5x4.5x11 in)

Heating magnetic stirrer

The ARE magnetic stirrer is the “universal” solution for the most common laboratory requirements owing to its features of reliability and safety.

ARE is equipped with a heating plate made of aluminum alloy and coated with a special protection that ensures even heat distribution over the entire surface with excellent resistance to chemical reagents.

Instruments	Power supply	Code No
ARE	230 V / 50 Hz	F20520162
ARE	230 V / 60 Hz	F20530162
ARE	115 V / 60 Hz	F20540162

Optional Accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 9,5x60 mm	A00001061
Support rod	A00001069

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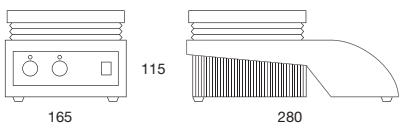


AREX

Technical Data

Aluminium casted structure with an epoxy paint purposely studied that ensures an excellent resistance to chemicals and mechanical corrosion in general.

Electronic speed regulation:	up to 1300 rpm

Counter-reaction: technology to assure a constant speed even when the viscosity changes

High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation

Electronic temperature regulation: from room temp. to 370°C

Heating plate diameter:	155 mm

Sample thermoregulation with a ±0,5°C precision by the Vertex thermoregulator

Stirring volume (H2O):	up to 20 liters
Protection rating CEI EN 60529:	IP42
Power:	650W
Weight:	2.9 kg (6.4 lb)
Dimension (WxHxD):	165x115x280 mm (6.5x4.5x11 in)

Heating magnetic stirrer

Magnetic stirrer with heating plate made of aluminum alloy and coated with a special protection that ensures even heat distribution over the entire surface with excellent resistance to chemical agents.
AREX is characterized by a sophisticated technology and proves to be the optimum solution even for the most varied needs.
This instrument is equipped with advanced electronics that keep the speed constant even when the viscosity changes (counter-reaction) and guarantee fine thermoregulation of the heating plate while ensuring elevated reliability and safety.

The instrument is provided with a connection for a Vertex contact thermometer (Code F208B0063) so as to directly control the temperature of the liquid, ensuring maximum precision (±0.5°C).

Instruments	Power supply	Code No
AREX	230 V / 50 – 60 Hz	F20500163
AREX	115 V / 60 Hz	F20540163

Complete of	Code No
Support rod	A00001069

Optional accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 9,5x60 mm	A00001061
Digital thermoregulator Vertex type VTF	F208B0063
Spiral electric cable complete of plug	40000781*

* for the connection to other contact termometer different from Vertex VTF model

VTF

Technical Data

Thermoregulation range:	-10…+300°C
Resolution:	0,2°C
Precision:	± 0,5°C
Working timer:	from 0:00 to 24:59 (h:min)
Stainless steel probe type Pt 100:	250 mm lenght - Ø 3 mm
Protection rating CEI EN 60529:	IP54
Remaining time reading:	possible
Clamping on rods:	Ø 10-13 mm
Weight:	0.3 kg (0.7 lb)
Dimension (WxHxD):	75x145x120 mm (3x5.7x4.7 in)

Safety devices:
Display visualization and automatic stop of the heating plate in case of:
- Damaged probe
- Interrupted probe
- Overtemperature

Vertex digital thermoregulator with “Fuzzy Logic” technology

The VTF digital thermoregulator is provided with Fuzzy Logic technology, which allows to use the instrument in many applications where precise thermoregulation is required.
It is possible to select the operation time with relative stopping of the thermoregulation.
It comes with the VELP system so that handling and positioning of the probe inside the liquid is easy.
The instrument can be used combined with the most common heating magnetic stirrers predisposed to the contact thermometers.

The following are available for thermoregulating highly corrosive solutions:
- glass probe for thermoregulating the solution (Code A00000003);
- probe extension cord for placing the thermoregulator away from the vapors produced by the analyzed solution (Code A00000002).

Connected to the accessory PW 10 (Code A00000001), it can be used with all heating devices, for example: water and oil baths, heating plates, thermomantles, etc.

Vertex VTF comes complete with temperature probe and connection cable ready to be connected to the Velp Scientifica magnetic stirrer model AREX and AREC.X.

Instruments	Power supply	Code No
VTF	12V dc	F208B0063

Optional accessories	Code No
Derivation element PW10	A00000001*
Probe extension cable, lenght 1m	A00000002
Glass probe	A00000003
Clamp for the probe	A00000004

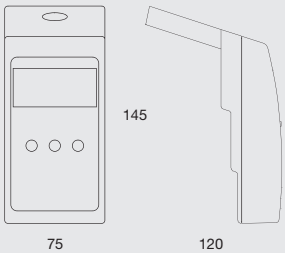
* available at 230 V or 115 V


A00000001


A00000002


A00000003


A00000004



ARED

Technical Data

Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

Electronic speed regulation:	up to 1200 rpm

High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation

Temperature regulation:	from room temp. to 370°C
Heating plate diameter:	180 mm
Stirring volume (H2O):	up to 25 liters
Power:	900W
Weight:	3.1 kg (6.8 lb)

Dimension (WxHxD): 190x110x245 mm (7.5x4.3x9.6 in)

High power heating magnetic stirrer

High power heating magnetic stirrer for medium-high volumes (up to 25 liters).
ARED has a 900W heating plate made of aluminum alloy and coated with a special black protection that ensures even distribution of the heat over the entire surface, with excellent resistance to chemical reagents.

Instruments	Power supply	Code No
ARED	230 V / 50 Hz	F20520169
ARED	230 V / 60 Hz	F20530169
ARED	115 V / 60 Hz	F20540169

Optional accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 9,5x60 mm	A00001061
Support rod	A00001069

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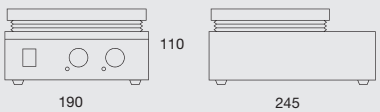

T.ARE

Technical Data

Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

Electronic speed regulation:	up to 1200 rpm
High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation	
Temperature regulation:	from room temp. to 370°C
Heating plate diameter:	180 mm
Programmable timer:	0-60 minutes or continuous operation
Stirring volume (H2O):	up to 25 liters
Power:	900W
Weight:	3,1 kg (6.8 lb)
Dimension (WxHxD): 190x110x245 mm (7.5x4.3x9.6 in)	

High power heating magnetic stirrer with timer

High power heating magnetic stirrer for medium-high volumes (up to 25 liters).
T.ARE has a 900W heating plate made of aluminum alloy and coated with special black protection that ensures even distribution of the heat over the entire surface, with excellent resistance to chemical agents.
It is equipped with a timer that can be programmed up to 60 minutes and automatically switches off so one can work in total safety; possibility of continuous operation.

Instruments	Power supply	Code No
T.ARE	230 V / 50 Hz	F20520170
T.ARE	230 V / 60 Hz	F20530170
T.ARE	115 V / 60 Hz	F20540170

Optional accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 9,5x60 mm	A00001061
Support rod	A00001069

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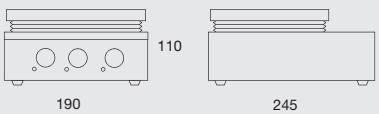


AREC

Technical Data

Aluminum die-casting housing with a paint purposely studied and tested that ensures an excellent resistance to chemicals and mechanical agents.	
Electronic speed regulation:	up to 1300 rpm
Counter-reaction: technology to assure a constant speed even if sample viscosity changes	
High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation	
Electronic temperature control:	from room temp. to 540°C
Reading on the display of the set temperature	
Dimensions of the heating plate entirely made of ceramic material:	200x200 mm (7.9x7.9 in)
Stirring volume (H2O):	up to 15 liters
Protection rating CEI EN 60529:	IP 42
Power:	800W
Weight:	3.9 Kg (8.6 lb)
Dimension (WxHxD): 205x96x335 mm (8x3.7x13.2 in)	

Digital ceramic top hot plate stirrer

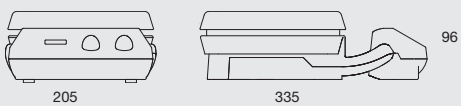
The newest product of the Stirring Line developed by VELP Scientifica within the sphere of heating magnetic stirrers.

AREC has a white ceramic heating plate that is highly resistant to corrosion and excellent for observing changes of color (e.g. titrations, etc.) and is extremely easy to clean.
The built-in electronic system keeps the stirring speed constant, even when the viscosity of the liquid changes (counter-reaction).

An advanced, reliable and safe solution offered by VELP Scientifica for diversified needs.

Instruments	Power supply	Code No
AREC	230 V / 50-60 Hz	F20500010
AREC	115 V / 50-60 Hz	F20510010

Optional accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 9,5x60 mm	A00001061
Magnetic stir bar, 10x40 mm	A00001060
Support rod	A00001069



AREC.X

Technical Data

Aluminum die-casting housing with a paint purposely studied and tested assuring a high resistance to chemicals and mechanical agents.	
Electronic speed regulation:	up to 1300 rpm
Counter-reaction: technology to assure a constant speed even if sample viscosity changes	
High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation	
Electronic temperature control: from room temp. to 540°C	
Reading on the display of the set temperature	
Dimensions of the heating plate entirely made of ceramic material:	200x200 mm (7.9x7.9 in)
Sample thermoregulation with a ±0,5°C precision by the Vertex thermoregulator	
Stirring volume (H2O):	up to 15 liters
Protection rating CEI EN 60529:	IP 42
Power:	800W
Weight:	3.9 Kg (8.6 lb)
Dimension (WxHxD):	205x96x335 mm (8x3.7x13.2 in)

Digital ceramic top hot plate stirrer with connection to a contact thermometer

The newest product of the Stirring Line developed by VELP Scientifica within the sphere of heating magnetic stirrers.

This new VELP stirrer is equipped by a connection for a contact Vertex thermostat for the direct control of temperature of the stirred liquid.

AREC has a white ceramic heating plate that is highly resistant to corrosion and excellent for observing changes of color (e.g. titrations, etc.) and is extremely easy to clean. The built-in electronic system keeps the stirring speed constant, even when the viscosity of the liquid changes (counter-reaction).

An advanced, reliable and safe solution offered by VELP Scientifica for diversified needs.

Instruments	Power supply	Code No
AREC.X	230 V / 50-60 Hz	F20500060
AREC.X	115 V / 50-60 Hz	F20510060

Complete of	Code No
Support rod	A00001069

Optional accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 9,5x60 mm	A00001061
Magnetic stir bar, 10x40 mm	A00001060
Digital thermoregulator Vertex type VTF	F208B0063
Spiral electric cable complete of plug	40000781

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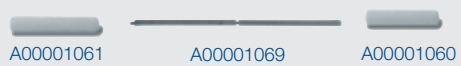

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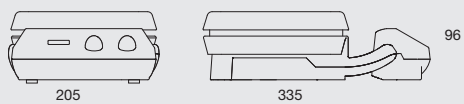


AREC.T

Technical Data

Aluminum die-casting housing with a paint purposely studied and tested assuring a high resistance to chemicals and mechanical agents.

Electronic speed regulation:	up to 1300 rpm

Counter-reaction: technology to assure a constant speed even if sample viscosity changes

High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation

Electronic temperature control: from room temp. to 540°C

Programmable timer up to 999 minutes with automatic switch off.

Reading on the display of the set temperature

Dimensions of the heating plate entirely made of ceramic material:	200x200 mm (7.9x7.9 in)
Stirring capacity (H2O):	up to 15 liters
Protection rating CEI EN 60529:	IP 42
Power:	800W
Weight:	3.9 Kg (8.6 lb)
Dimension (WxHxD):	205x96x335 mm (8x3.7x13.2 in)

Digital ceramic top hot plate stirrer with timer

The newest product of the Stirring Line developed by VELP Scientifica within the sphere of heating magnetic stirrers.

This new VELP stirrer is provided with a programmable timer up to 999 minutes with automatic switch off.

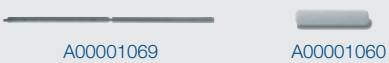
AREC has a white ceramic heating plate that is highly resistant to corrosion and excellent for observing changes of color (e.g. titrations, etc.) and is extremely easy to clean. The built-in electronic system keeps the stirring speed constant, even when the viscosity of the liquid changes (counter-reaction).

An advanced, reliable and safe solution offered by VELP Scientifica for diversified needs.

Instruments	Power supply	Code No
AREC.T	230 V / 50-60 Hz	F20500050
AREC.T	115 V / 50-60 Hz	F20510050

Optional accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 9,5x60 mm	A00001061
Magnetic stir bar, 10x40 mm	A00001060
Support rod	A00001069

A00001071 A00001072 A00001073 A00001056 A00001061



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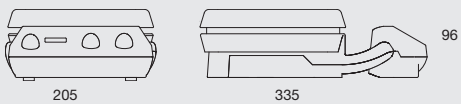

AM4

Technical Data

Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

Electronic speed control:	up to 1200 rpm for each stirring position
High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation	
Temperature regulation:	from room temp. to 370°C for each stirring position
Heating plate diameter:	155 mm
Stirring volume (H2O):	up to 5 liters (x4)
Power:	2550W
Weight:	8,3 kg (18.2 lb)

Dimension (WxHxD): 715x115x220 mm (28.1x4.5x8.7 in)

Multiple heating magnetic stirrer

Heating magnetic stirrer with 4 separately controlled positions.
The heating plates are made of aluminum alloy and coated with a special black protection that ensures even distribution of the heat over the entire surface, with excellent resistance to chemical agents.

Instruments	Power supply	Code No
AM4	230 V / 50 Hz	F20520166
AM4	230 V / 60 Hz	F20530166

Optional accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 9,5x60 mm	A00001061
Support rod	A00001069

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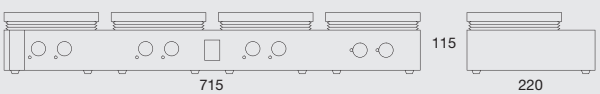
A00001069



ESP

Technical Data

Stirring speed:	up to 1100 rpm
Stirring volume (H2O):	up to 5 liters
Allowed room temperature:	from -10 to +60°C
Power:	5W
Weight:	0,9 kg (2.0 lb)
Dimension (WxHxD):	160x33x230 mm (6.3x1.3x9 in)

Ultraflat magnetic stirrer

Ultraflat magnetic stirrer without moving mechanical components that does not require maintenance.
The stirring system, adjustable by means of a microprocessor, is made up of coils that induce a rotating magnetic field.
Its gentle start-up allows optimum progression of the stirring speed. The modern, ergonomic structure is formed by materials that guarantee high resistance to the aggression of chemical reagents.

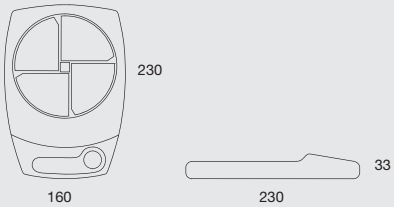
The ESP is supplied with switching power supply and European plug.

Instruments	Power supply	Code No
ESP	100-240 V / 50-60 Hz	F206A0179

Interchangeable Plug	Code No
US Plug	10003083
UK Plug	10003084
Australian Plug	10003085

Optional accessories	Code No
Magnetic stir bar 10x40 mm	A00001060

A00001060 10003083 10003084 10003085



MST MICROSTIRRER

Technical Data

MICROSTIRRER:	painted metal structure
MST:	ABS structure
Electronic speed regulation:	up to 1100 rpm
Excellent speed control even at low revolutions	
Stirring volume (H2O):	up to 5 liters
Power:	0,6 W
Weight MST: Weight MICROSTIRRER:	0.4 kg (0.9 lb) 0.55 kg (1.1 lb)
Dimension (WxHxD) MST: Dimension (WxHxD) MICROSTIRRER:	130x50x150 mm (5.1x2x5.9 in) 120x48x128 mm (4.7x1.9x5 in)

Magnetic stirrer

The MST and MICROSTIRRER magnetic stirrers are small, simple and effective stirrers specially designed for microtitrations. They are extremely useful where reliable and small instruments are needed.
The stirrer stays cold even after several days of continuous use. This feature makes them particularly appreciated in microbiology and biochemistry. Both structures ensure high resistance to chemical agents.

The MST and MICOSTIRRER are supplied with switching power supply and European plug.

Instruments	Power supply	Code No
MST	100-240 V / 50-60 Hz	F203A0160
MICROSTIRRER	100-240 V / 50-60 Hz	F203A0161

Interchangeable Plug	Code No
US Plug	10003083
UK Plug	10003084
Australian Plug	10003085

Optional accessories	Code No
Magnetic stir bar 6x35 mm	A00001056
Magnetic stir bar 6x20 mm	A00001057

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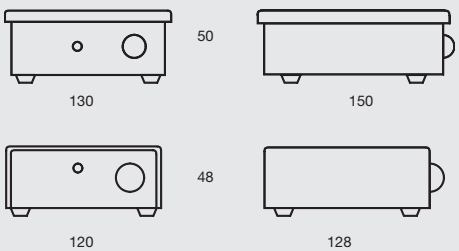


AGE

Technical Data

Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

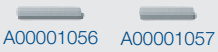
Electronic speed regulation:	up to 1200 rpm
High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation	
Stirring volume (H2O):	up to 8 liters
Power:	40W
Weight:	1,8 kg (4 lb)
Dimension (WxHxD):	171x75x190 mm (6.7x2.9x7.5 in)

Magnetic stirrer

Magnetic stirrer with electronic speed adjustment up to 1200 rpm by means of a continuous regulator.
Suitable for common laboratory stirring requirements.

Instruments	Power supply	Code No
AGE	230 V / 50 Hz	F20320164
AGE	230 V / 60 Hz	F20330164
AGE	115 V / 60 Hz	F20340164

Optional accessories	Code No
Magnetic stir bar 6x35 mm	A00001056
Magnetic stir bar 6x20 mm	A00001057



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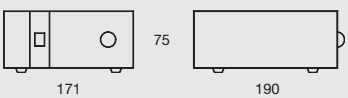


ATE

Technical Data

Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

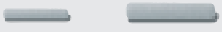
Electronic speed regulation:	up to 1100 rpm
High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation	
Srirring volume (H2O):	up to 25 liters
Power:	15W
Weight:	3,7 kg (8.1 lb)
Dimension (WxHxD): 250x120x285 mm (9.8x4.7x11.2 in)	

Magnetic stirrer for high volumes

High power magnetic stirrer.
Suitable for stirring medium-high volumes, it is able to keep the set rpm constant even when the density of the liquids being stirred change.

Instruments	Power supply	Code No
ATE	230 V / 50 – 60 Hz	F20300165
ATE	115 V / 50 - 60 Hz	F20310165

Optional accessories	Code No
Magnetic stir bar 6x35 mm	A00001056
Magnetic stir bar 9,5x60 mm	A00001061



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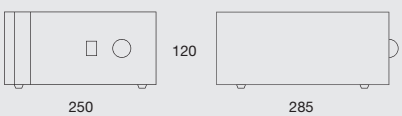


MULTISTIRRER 6
MULTISTIRRER 15

Technical Data

Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

Electronic speed regulation: from 50 to 850 rpm

Excellent speed control even at low revolutions

High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation

Stirring volume (H2O):
6 beakers,400 ml (Multistirrer 6)
or 15 beakers tall form,250 ml (Multistirrer 15)

Power MULTISTIRRER 6: 3,6 W
Power MULTISTIRRER 15: 9 W

Weight MULTISTIRRER 6: 1.75 Kg (3.8 lb)
Weight MULTISTIRRER 15: 2.1 Kg (4.6 lb)

Dimension (WxHxD) MULTISTIRRER 6 :
230x51.5x370 mm (9x2x14.5 in)
Dimension (WxHxD) MULTISTIRRER 15:
230x51.5x370 mm (9x2x14.5 in)

The MULTISTIRRER6 and MULTISTIRRER15 are supplied with switching power supply and European plug.

Instruments	Power supply	Code No
MULTISTIRRER 6	100-240V / 50-60 Hz	F203A0177
MULTISTIRRER 15	100-240V / 50-60 Hz	F203A0178

Interchangeable Plug	Code No
US Plug	10003083
UK Plug	10003084
Australian Plug	10003085

Optional accessories	Code No
Thermostatic bath for samples, 408x240x85 mm	A00001055
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 6x20 mm	A00001057*

*Suggested for Multistirrer 15

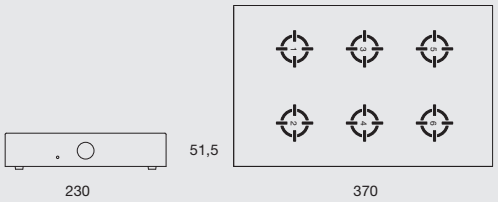

A00001055 A00001056 A00001057

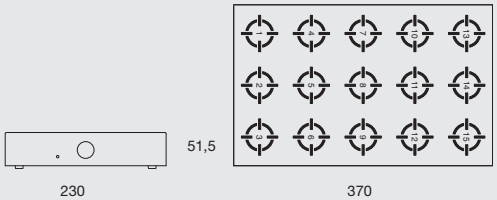
10003083 10003084 10003085

Multiposition magnetic stirrer

Magnetic stirrer able to stir up to 6 beakers having a maximum diameter of 85 mm (Multistirrer 6) or up to 15 beakers having a maximum diameter of 64 mm (Multistirrer 15) at the same time.

The stirrer stays cold even after several days of continuous operation. This feature makes it particularly appreciated in microbiology and biochemistry.
It is possible to thermostat the samples with a suitable recirculating water bath.





AMI - AMI 4

Technical Data

Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

Electronic speed regulation:	up to 1100 rpm

Excellent speed regulation even at low number of revolutions

High-power driving magnet type “PCM” operated by a mono-phase motor for continuous operation

Stirring volume (H2O):	up to 5 liters (x4 for AMI 4)
Power AMI:	1,2 W
Power AMI 4:	4.8 W
Weight AMI:	1.2 Kg (2.6 lb)
Weight AMI4:	4 Kg (8.8 lb)
Dimension (WxHxD) AMI :	150x55x270 mm (5.9x2.2x10.6 in)
Dimension (WxHxD) AMI 4:	600x55x270 mm (23.6x2.2x10.6 in)

The AMI and AMI4 are supplied with switching power supply and European plug.

Instruments	Power supply	Code No
AMI	100-240 V / 50-60 Hz	F204A0167
AMI4	100-240 V / 50-60 Hz	F204A0168

Interchangeable Plug	Code No
US Plug	10003083
UK Plug	10003084
Australian Plug	10003085

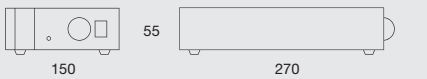
10003083 10003084 10003085

Optional accessories	Code No
Magnetic stir bar, 6x35 mm	A00001056
Magnetic stir bar, 6x20mm	A00001057

A00001056 A00001057

Illuminated magnetic stirrer

Illuminated magnetic stirrer, either with single-position (AMI) or with 4 separately controlled positions (AMI 4).
This appliance is specially designed for titrations, and particularly for those in which optimum lighting conditions are needed in order to see the final point of color change well.
It is particularly recommended for titrations that have weak color changes during conversion.



Overhead Stirrers

Overhead stirrers are generally used in solubilization, mixing, suspension, emulsification and homogenization operations.
VELP Scientifica supplies a complete range of overhead stirrers with electronic adjustment that are equipped with advanced safety systems and are able to fully meet the most diversified needs of a laboratory (in terms of both viscosity and volumes of the liquids to be stirred).
In the wide selection of electronic stirrers supplied by Velp Scientifica, the laboratory professional will be able to choose the solution best suited to his needs.

Main applications
Overhead stirrers can be used at different speeds for whirling light solids, for flocculations, for mixing thickening agents, stirring sludge, etc.

Description	ES	BS	PW	DLS	LH	DLH
Power supply	230V or 115V	230V or 115V	230V or 115V	230V or 115V	230V or 115V	230V or 115V
Power W	35	60	120	60	120	120
Dimensions mm (WxHxD) (in)	80x160x200 (3.1x6.3x7.9)	80x215x196 (3.1x8.5x7.7)	80x230x196 (3.1x9x7.7)	80x215x196 (3.1x8.5x7.7)	80x230x196 (3.1x9x7.7)	80x230x196 (3.1x9x7.7)
Weight Kg (lb)	1,7 (3.7)	2,8 (6.2)	3,4 (7.5)	3,0 (6.6)	3,4 (7.5)	3.5(7.7)
Stirring speed rpm	50-1300	50-2000	20-1200	50-2000	50-2000	50-2000
Visualization of effective speed	–	–	–	Display	–	Display
Visualization of set speed	graduated scale	graduated scale	graduated scale	Display	graduated scale	Display
Speed control	–	–	–	YES	YES	YES
Stirring volume max. H_2O (liters)	15	25	70	25	40	40
Max viscosity (mPa.s)	1000	10000	100000	25000	50000	50000
Progressive start-up	YES	YES	YES	YES	YES	YES
Torque max (Ncm)	17	75	135	45	90	90
Electronic protection degree	IP 40	IP 40	IP 40	IP 40	IP 40	IP 40
Chuck type	self-blocking	self-blocking	self-blocking	self-blocking	self-blocking	self-blocking
Chuck max range (mm)	10	10	10	10	10	10
Max through stirrer shaft diameter (mm)	8,5	8,5	8,5	8,5	8,5	8,5

(*) mPa.s = 1 Centipoise

ES

Technical Data

Stirring speed:	50 - 1300 rpm
Stirring volume max (H2O):	15 liters
Allowed room temperature:	0 – 40°C
Chuck range:	1 – 10 mm
Power:	35W
Weight:	1,7 kg (3.7 lb)
Dimension (WxHxD):	80x160x200 mm (3.1x6.3x7.9 in)

Overhead stirrer

Economic overhead stirrer for simple medium and low-speed liquid stirring applications (max 1000 mPa.s). Suitable for stirrings up to 15 liters (H2O), with speed adjustment ranging between 50 and 1300 rpm. Its progressive start-up prevents liquid from coming out of the beaker.
A safety system trips to block stirring in case the instrument overheats. The technologies and materials used make operation reliable and quiet, and the instrument easy to use and light in weight while occupying minimum space. Thanks to its compact structure and ergonomic design, the instrument is both reliable and attractive.

Instruments	Power supply	Code No
ES	230 V / 50 – 60 Hz	F20100152
ES	115 V / 50 - 60 Hz	F20110152

Optional accessories	Code No
Support rod and base	A00001300
Double clamp	A00001301
Ribbon clamp	A00001302
Stirring shaft with floating blades, stainless steel	A00001304
Stirring shaft with folding blade, stainless steel	A00001305
Stirring shaft with fixed blade, stainless steel	A00001306
Stirring shaft with propeller, stainless steel	A00001307
Stirring shaft with paddle, 6 holes, stainless steel	A00001308
Stirring shaft with turbine, stainless steel	A00001309
Stirring shaft with turbo propeller, stainless steel	A00001310
Stirring shaft with anchor, stainless steel	A00001311


A00001300


A00001301


A00001302


A00001304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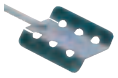
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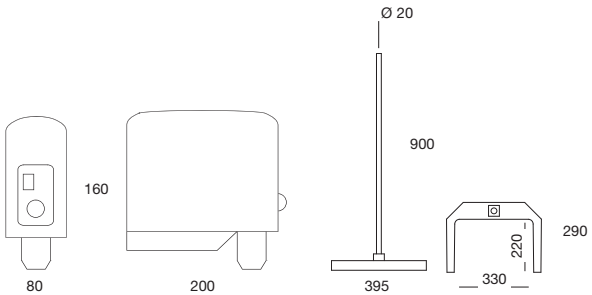


BS

Technical Data

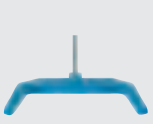
Stirring speed:	50 - 2000 rpm
Stirring volume max (H2O):	25 liters
Allowed room temperature:	0 – 40°C
Chuck range:	1 – 10 mm
Power:	60W
Weight:	2,8 kg (6.2 lb)
Dimension (WxHxD):	80x215x196 mm (3.1x8.5x7.7 in)

Overhead stirrer

Overhead stirrer for stirring liquids of medium-low viscosity (max 10000 mPa.s).
Suitable for volumes up to 25 liters (H2O), with speed adjustment ranging from 50 to 2000 rpm.
The instrument can be safely operated continuously since it is equipped with special systems that block it in case of malfunctioning or heavy work.
Its progressive start-up prevents liquid from coming out of the beaker. The compact structure, microprocessor-controlled motor, and safety chuck without key make the instrument particularly simple to use and extremely reliable and quiet.
Ergonomic design, minimum occupied space and lightweight.

Instruments	Power supply	Code No
BS	230 V / 50 – 60 Hz	F20100151
BS	115 V / 50 - 60 Hz	F20110151

Optional accessories	Code No
Support rod and base	A00001300
Double clamp	A00001301
Ribbon clamp	A00001302
Stirring shaft with floating blades, stainless steel	A00001304
Stirring shaft with folding blade, stainless steel	A00001305
Stirring shaft with fixed blade, stainless steel	A00001306
Stirring shaft with propeller, stainless steel	A00001307
Stirring shaft with paddle, 6 holes, stainless steel	A00001308
Stirring shaft with turbine, stainless steel	A00001309
Stirring shaft with turbo propeller, stainless steel	A00001310
Stirring shaft with anchor, stainless steel	A00001311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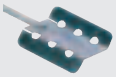
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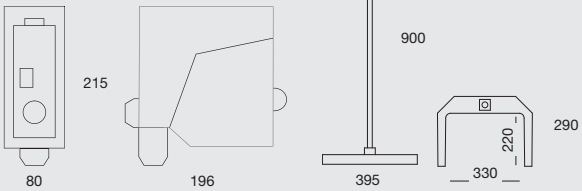

PW

Technical Data

Stirring speed:	20 - 1200 rpm
Stirring volume max (H2O):	70 liters
Allowed room temperature:	0 – 40°C
Chuck range:	1 – 10 mm
Power:	120W
Weight:	3,4 kg (7.5 lb)

Dimension (WxHxD) : 80x230x196 mm (3.1x9x7.7 in)

Overhead stirrer

Overhead stirrer for stirring high viscosity liquids (max 100000 mPa.s).
Suitable for volumes up to 70 liters (H2O), with speed adjustment ranging from 20 to 1200 rpm.
The instrument can be safely operated continuously since it is equipped with special systems that block it in case of malfunctioning or heavy work.
Its progressive start-up prevents liquid from coming out of the beaker. Powerful and dynamic microprocessor-controlled motor, safety chuck without key, compact structure.
Ergonomic design, occupies little space, lightweight, simple to use and of utmost reliability.

Instruments	Power supply	Code No
PW	230 V / 50 – 60 Hz	F20100150
PW	115 V / 50 - 60 Hz	F20110150

Optional accessories	Code No
Support rod and base	A00001300
Double clamp	A00001301
Ribbon clamp	A00001302
Stirring shaft with floating blades, stainless steel	A00001304
Stirring shaft with folding blade, stainless steel	A00001305
Stirring shaft with fixed blade, stainless steel	A00001306
Stirring shaft with propeller, stainless steel	A00001307
Stirring shaft with paddle, 6 holes, stainless steel	A00001308
Stirring shaft with turbine, stainless steel	A00001309
Stirring shaft with turbo propeller, stainless steel	A00001310
Stirring shaft with anchor, stainless steel	A00001311


A00001300


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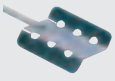
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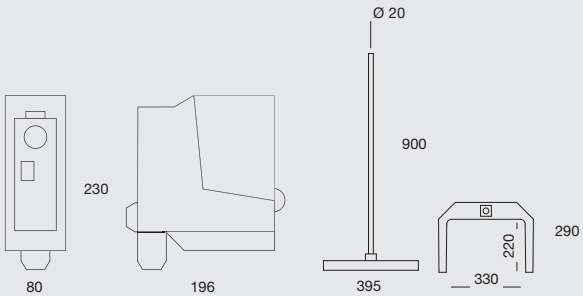


DLS

Technical Data

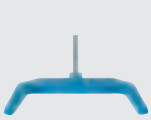
Stirring speed:	50 - 2000 rpm
Stirring volume max (H2O):	25 liters
Speed (rpm) visualization:	display LCD
Resolution:	1rpm
Allowed room temperature:	0 – 40°C
Chuck range:	1 – 10 mm
Power:	60W
Weight:	3 kg (6.6 lb)
Dimension (WxHxD):	80x215x196 mm (3.1x8.5x7.7 in)

Overhead stirrer

Overhead stirrer for stirring medium-viscosity liquids (max 25000 mPa.s).
It has two digital displays indicating the actual and set speeds in an easily viewable manner.
The dynamic and powerful motor of proven durability and sturdiness is controlled by a microprocessor that permits constant speed, even when the viscosity of the stirred liquid changes.
Speed preselection from 50 to 2000 rpm.
Progressive start-up prevents the stirred liquid from coming out of the beaker.
A safety system protects the instrument from “overloads” in case the motor malfunctions or jams.
The safety chuck without key and the technologies adopted ensure safe operation and ease of use with minimum space occupied and a light weight.

Instruments	Power supply	Code No
DLS	230 V / 50 – 60 Hz	F20100155
DLS	115 V / 50 - 60 Hz	F20110155

Optional accessories	Code No
Support rod and base	A00001300
Double clamp	A00001301
Ribbon clamp	A00001302
Stirring shaft with floating blades, stainless steel	A00001304
Stirring shaft with folding blade, stainless steel	A00001305
Stirring shaft with fixed blade, stainless steel	A00001306
Stirring shaft with propeller, stainless steel	A00001307
Stirring shaft with paddle, 6 holes, stainless steel	A00001308
Stirring shaft with turbine, stainless steel	A00001309
Stirring shaft with turbo propeller, stainless steel	A00001310
Stirring shaft with anchor, stainless steel	A00001311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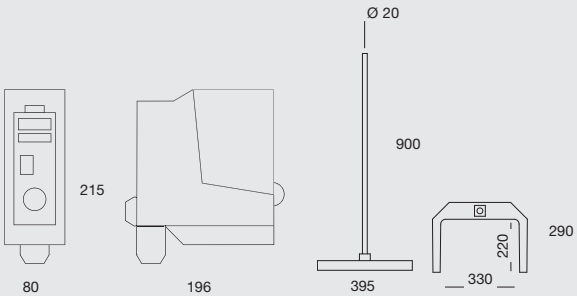


LH - DLH

Technical Data

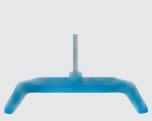
Stirring speed:	50 - 2000 rpm
Stirring volume max (H2O):	40 liters
Speed (rpm) visualization:	display LCD (only for DLH)
Resolution:	1rpm (only for DLH)
Allowed room temperature:	0 – 40°C
Chuck range:	1 – 10 mm
Power:	120W
Weight LH: Weight DLH:	3,4 kg (7.5 lb) 3,5 kg (7.7 lb)
Dimension (WxHxD) LH: Dimension (WxHxD) DLH:	80x230x196 mm (3.1x9x7.7 in) 80x230x196 mm (3.1x9x7.7 in)

Overhead stirrer

The LH and DLH rod stirrer models are characterized by strong rotation torque that allows liquids with high viscosity (max 50000 mPa.s) to be used.
The dynamic and powerful motor of proven durability and sturdiness is controlled by a microprocessor that permits constant speed, even when the viscosity of the stirred liquid changes. Speed preselection from 50 to 2000 rpm. Progressive start-up prevents the stirred liquid from coming out of the beaker. A safety system protects the instrument from “overloads” in case the motor malfunctions or jams.
The safety chuck without key and the technologies adopted ensure safe operation and ease of use with minimum space occupied and a light weight.
The DLH model has two digital displays indicating the actual and set speeds in an easily viewable manner.

Instruments	Power supply	Code No
LH	220 – 240 V / 50 – 60 Hz	F20100156
LH	110 – 120 V / 50 - 60 Hz	F20110156
DLH	220 – 240 V / 50 – 60 Hz	F20100157
DLH	110 – 120 V / 50 - 60 Hz	F20110157

Optional accessories	Code No
Support rod and base	A00001300
Double clamp	A00001301
Ribbon clamp	A00001302
Stirring shaft with floating blades, stainless steel	A00001304
Stirring shaft with folding blade, stainless steel	A00001305
Stirring shaft with fixed blade, stainless steel	A00001306
Stirring shaft with propeller, stainless steel	A00001307
Stirring shaft with paddle, 6 holes, stainless steel	A00001308
Stirring shaft with turbine, stainless steel	A00001309
Stirring shaft with turbo propeller, stainless steel	A00001310
Stirring shaft with anchor, stainless steel	A00001311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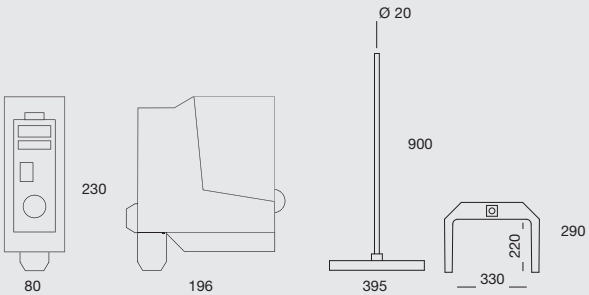


Stirring shaft with floating blades Code A00001304
Characteristics: The two blades that open as the speed rises generate an axial flow in the container, from the top towards the bottom. Particularly recommended for stirring in narrow-neck containers, e.g. flasks.

Stirring shaft with folding blade Code A00001305
Characteristics: The blade that automatically falls into line during rotation generates an axial flow in the container, from the top towards the bottom. Particularly recommended for stirring in narrow-neck containers.
Employment: Use at medium-high speed for whirling light solids, for flocculations, mixing thickening agents, stirring sludge, etc.

Stirring shaft with fixed blade Code A00001306
Characteristics: It generates an axial flow in the container, from the top towards the bottom.
Employment: Use at medium-high speed for whirling light solids, for flocculations, mixing thickening agents, stirring sludge, etc.

Stirring shaft with propeller Code A00001307
Characteristics: Standard stirring shaft. It generates an axial flow in the container with suction of the substance from the bottom towards the top and localized occurence of shearing forces.
Employment: Use at medium-high speed for whirling light solids, for flocculations, mixing thickening agents, stirring sludge, etc.

Stirring shaft with 6-hole paddle Code A00001308
Characteristics: It generates a tangential flow with reduced turbulence and with gentle mixing of the product.
Employment: Use at medium to low speeds where good heat exchange between the components to be mixed is required.

Stirring shaft with turbine blade Code A00001309
Characteristics: It generates a radial flow with suction of the product from the top towards the bottom, with high turbulence and high shearing forces.
Employment: Use at medium to high speeds to dissolve and disintegrate particles.

Stirring shaft with turbo propeller Code A00001310
Characteristics: It generates an axial flow in the container with suction of the substance from the top towards the bottom with low shearing forces. Limited danger of any contact of the blade with the walls of the product's container.
Employment: Use at medium-high speeds for whirling light solids, preparing dye mixtures and for flocculations.

Stirring shaft with anchor Code A00001311
Characteristics: It generates a tangential flow with high shearing forces on the ends. The flow generated limits the possibility of sedimentation on the walls of the container.
Employment: Use at medium-low speeds for homogenizing high contents of solids in liquids with medium-high viscosity.

Choosing the correct stirring shafts

Stirring shafts must be chosen bearing in mind the stirrer power, the volume of substances to be stirred and its viscosity. The technical features and the application fields of the stirring shafts are summarized in the following tables:

Speed range	rpm
Low (L)	< 250
Medium (M)	250 – 800
High (H)	> 800

Viscosity range	mPa.s
Very low (VL)	0 – 100
Low (L)	100 - 1000
Medium (M)	1000 – 10000
High (H)	10000 - 100000

Approximate viscosity values of different substances, expressed in centipoise (mPa. s) at 20°C

Viscosity	Substance
1	Water
5	Milk
10	Kerosene
100	Lubricating oil
1000	Castor oil, Glicerine
7000	Refined honey
25000	Chocolate syrup
50000	Ketchup
100000	Molasses

Description	Code	Blades number	Blades Ø mm	Ø of shaft mm	Lenght of shaft mm	Speed range	Viscosity
Stirring shaft with floating blades, stainless steel	A00001304	2	93	7	400	M-H	VL-L
Stirring shaft with folding blade, stainless steel	A00001305	1	60	7	400	M-H	VL-L
Stirring shaft with fixed blade, stainless steel	A00001306	1	50	7	400	M-H	VL-L-M
Stirring shaft with propeller, stainless steel	A00001307	3	60	7	400	M-H	VL-L-M
Stirring shaft with paddle,six holes, stainless steel	A00001308	1	69	7	450	L-M	L-M
Stirring shaft with turbine, stainless steel	A00001309	10	49	7	450	M-H	M-H
Stirring shaft with turbo propeller, stainless steel	A00001310	3	46	7	450	M-H	M-H
Stirring shaft with anchor, stainless steel	A00001311	2	45	8	450	L-M	M-H

RC - RC2

Technical Data

RC
Aluminum die-casting housing with a paint purposely studied and tested that ensures an excellent resistance to chemicals and mechanical agents.

RC2
Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

Temperature regulation:	from room temp. to 370°C
Heating plate diameter:	155mm
Power RC: Power RC2:	600W 1200W
Weight RC: Weight RC2:	1,7 kg (3.7 lb) 3,3 Kg (7.3 lb)

Dimension (WxHxD) RC: 165x115x280 mm (6.5x4.5x11 in)
Dimension (WxHxD) RC2: 340x90x190 mm (13.4x3.5x7.5 in)

Heating Plates

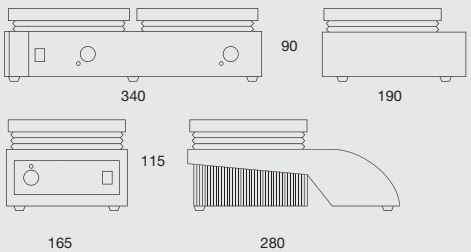
Heating plates with possibility to adjust the temperature, available in the single-position (RC) or two-position (RC2) versions.

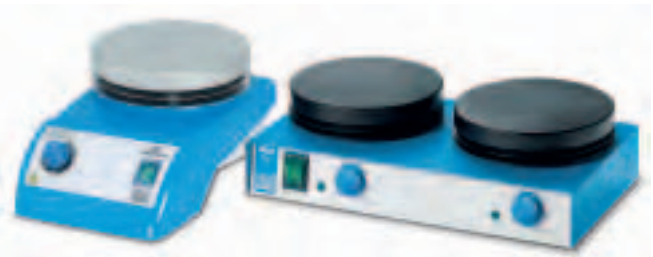
RC and RC2 are equipped with a heating plate made of aluminum alloy and coated with a special protection that ensures even distribution of the heat over the entire surface, with excellent resistance to chemical reagents.

Instruments	Power supply	Code No
RC	230 V / 50 – 60 Hz	F20700174
RC	115 V / 50 - 60 Hz	F20710174
RC2	230 V / 50 – 60 Hz	F20700172
RC2	115 V / 50 - 60 Hz	F20710172

Optional accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073

A00001071 A00001072 A00001073





REC

Technical Data

Aluminum die-casting housing with a paint purposely studied and tested assuring a high resistance to chemicals and mechanical agents.

Heating plate:	ceramic material
Dimension of the heating plate: 200x200 mm (7.9x7.9 in)	
Electronic temperature control:	from room temp. to 540°C
Protection rating CEI EN 60529:	IP 42
Set temperature visualization:	display LCD
Power:	800 W
Weight:	3,15 Kg (7lb)
Dimension (WxHxD): 205x96x335 mm (8 x 3.7x13.2 in)	

Heating plate

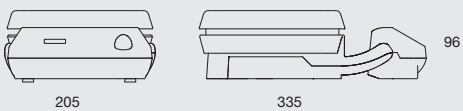
REC has a white ceramic heating plate that is highly resistant to corrosion, excellent for observing changes of color (e.g. titrations, etc.) and extremely easy to clean.
Microprocessor-controlled feed-back technology provides precise temperature up to 540°C and the bright red digital display visualizes always the temperature settings.
Safety features include a “Hot Plate” digital warning system which is constantly displayed during operations when the temperature is above 50°C and flashes when the unit is switched-off until the temperature is cooled to below 50°C.
The control panel that contains the electronic parts is completely separate from the heating plate in order to increase the safety rating during use.

Instruments	Power supply	Code No
REC	230 V / 50-60 Hz	F20700080
REC	115 V / 60 Hz	F20710080

Optional Accessories	Code No
Hemispheric bowl for 250 ml flasks	A00001071
Hemispheric bowl for 500 ml flasks	A00001072
Hemispheric bowl for 1000 ml flasks	A00001073
Support rod	A00001069

A00001071 A00001072 A00001073

A00001069

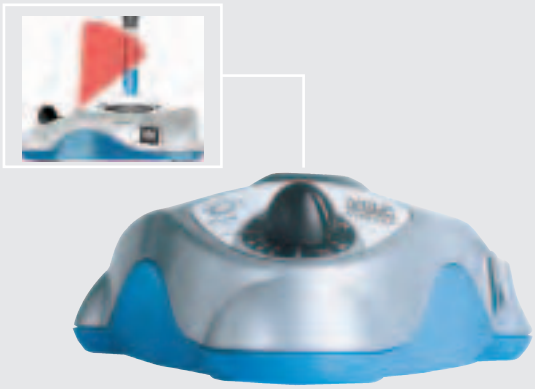


Vortex mixers

The Vortex mixers stirrers are used for mixing substances in test tubes (Eppendorf tubes, Erlenmeyer flasks, flasks, etc.) thanks to the orbital movement of the ubber cup.

The range VELP supplies is made up of four models, with continuous or manual operation, able to meet the different application needs of a laboratory.
To achieve utmost flexibility of use, the Velp Scientifica Vortex mixers are equipped with a wide range of accessories (optional) that make the instrument suited to a large variety of needs.

VELP Scientifica is the first company in the world to introduce a Vortex mixer on the market equipped with a special infrared ray system that activates vibration without any need for the operator to apply pressure (“Wizard” model).



Description	RX3	ZX3	CLASSIC	WIZARD
Power Supply	230 V or 115V	230 V or 115V	100÷240 V	100÷240 V
Dimensions mm (WxHxD) (in)	150x134x150 (5.9X5.3X5.9)	150x134x150 (5.9x5.3x5.9)	180x70x220 (7.1x2.8x8.7)	180x70x220 (7.1x2.8x8.7)
Weight kg (lb)	2 (4.4)	2 (4.4)	2,4 (5.3)	2,4 (5.3)
Speed Range (rpm)	2400 constant	50 ÷ 2400	0 ÷ 3.000	0 ÷ 3.000
Orbital diameter (mm)	5	5	4.5	4.5
Operational Mode	Automatic by pressure	Continuous /Automatic by pressure	Continuous /Automatic by pressure	Continuous / “Sensor” (Infrared IR Systems)
Electronic Protection Degree	IP20	IP20	IP42	IP42
Support System	4 holdfast feet	4 holdfast feet	3 anti-sliding feet	3 anti-sliding feet

ZX3 - RX3

Technical Data

Epoxy painted aluminum die-casting housing purposely developed and tested in order to assure a high resistance to chemical and mechanical agents.

4 holdfast feet for strong fixing and high stability of the instrument avoiding vibrations transmission to the lab bench.

Orbital diameter:	5 mm
Speed range:	50 – 2400 rpm (only for model ZX3)
Power:	45W
Weight:	2 kg (4.4 lb)

Dimension (WxHxD): 150x134x150 mm (5.9x5.3x5.9 in)

Vortex mixers

Vortex mixers designed for mixing solutions in test tubes or small flasks by means of a circular, oscillating movement.

Available in two versions:
- ZX3, equipped with two operation modes - manual and continuous - with the possibility to adjust the speed between 50 and 2400 rpm
- RX3, which operates with constant vibration speed (2400 rpm).

Instruments	Power supply	Code No
ZX3	230 V / 50 Hz	F20220176
ZX3	230 V / 60 Hz	F20230176
ZX3	115 V / 60 Hz	F20240176
RX3	230 V / 50 Hz	F20220171
RX3	230 V / 60 Hz	F20230171
RX3	115 V / 60 Hz	F20240171

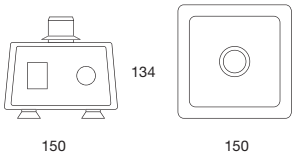
Optional accessories	Code No
Stand for 25 microvials Eppendorf-1,5 ml	A00001048*
Stand for microtiter	A00001047*
Supporting plate Ø 90 mm	A00001050

*only for ZX3 model


A00001048


A00001047


A00001050



VORTEX Classic

Technical Data

Epoxy painted zinc alloy structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

Three anti-sliding feet are able to absorb the vibrations, enhancing the stability on the lab bench.

Speed range:	0 –3000 rpm
Speed setting:	analogic
Speed control:	electronic
Operational mode:	Touch / Continuous
Type of movement:	Orbital
Orbital Diameter:	4,5 mm
Electronic Protection Degree CEI EN 60529:	IP42
Power:	15 W
Weight:	2,4 Kg (5.3 lb)

Dimension (WxHxD): 180x70x220 mm (7.1x2.8x8.7 in)

The Vortex Classic is supplied with switching power supply and European plug.

Instruments	Power supply	Code No
CLASSIC	100 - 240 V / 50 - 60 Hz	F202A0173

Interchangeable Plug	Code No
US Plug	10003083
UK Plug	10003084
Australian Plug	10003085

Optional accessories	Code No
Foam stand for n.°19 microvials 1.5ml-Eppendorf	A00000012
Customizable soft foam top	A00000013
Foam stand for n°5 test tubes Ø 16 mm	A00000014
Foam stand for microtiter	A00000015
Small rubber supporting plate Ø 50 mm	A00000016
Rubber supporting plate Ø 94 mm	A00000017
Foam stand for 4 test tubes Ø 29 mm	A00000019

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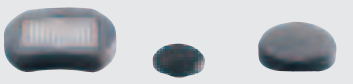

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Vortex Classic - The Vortex mixer evolution

VORTEX “CLASSIC” is the ultimate expression of continuous product evolution.
“CLASSIC” is a solution suited to the most diversified mixing needs. It is able to provide the highest performance ratings in terms of speed while at the same time ensuring reliability and safety.

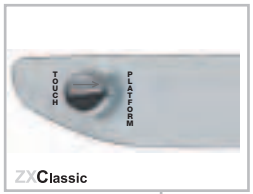
It is equipped with two operation modes, with the possibility to change the vibration frequency:

- **Touch** - the automatic “Touch” mode starts the shaking with a light amount of pressure applied by the test tube on the cupping glass.

- **Continuous** – continuous operation mode that, when combined with the use of a wide range of accessories (optional), make the instrument suited to a large variety of needs.

CLASSIC also has a special lever (Touch - Platform) that, when properly positioned, ensures maximum stability of the instrument depending on the operation mode selected.
Its advanced performance places the instrument at the highest standards of the market.

VORTEX CLASSIC comes standard with a cup for single test tube.



ZX**Classic**

VORTEX Wizard

Technical Data

Epoxy painted zinc alloy structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general.

Three anti-sliding feet are able to absorb the vibrations, enhancing the stability on the lab bench.

Speed range:	0 –3000 rpm
Speed setting:	analogic
Speed control:	electronic
Operational mode:	Sensor / Continuous
Type of movement:	Orbital
Orbital Diameter:	4,5 mm
Electronic Protection Degree CEI EN 60529:	IP42
Power:	15 W
Weight:	2,4 Kg (5.3 lb)
Dimension (WxHxD:	180x70x220 mm (7.1x2.8x8.7 in)

The Vortex Wizard is supplied with switching power supply and European plug.

Instruments	Power supply	Code No
WIZARD	100 - 240 V / 50 - 60 Hz	F202A0175

Interchangeable Plug	Code No
US Plug	10003083
UK Plug	10003084
Australian Plug	10003085

Optional accessories	Code No
Foam stand for n.°19 microvials 1.5ml-Eppendorf	A00000012
Customizable soft foam top	A00000013
Foam stand for n°5 test tubes Ø 16 mm	A00000014
Foam stand for microtiter	A00000015
Small rubber supporting plate Ø 50 mm	A00000016
Foam stand for 4 test tubes Ø 29 mm	A00000019

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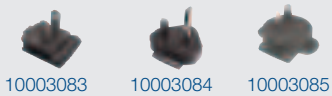

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Vortex Wizard - The next Vortex mixer generation

VORTEX “WIZARD” represents a radical technology innovation in vortex mixers evolutionary process. Based on optic technology, WIZARD is provided with an innovative operational mode, absolutely unique on the market. Infact, the infrared system (IR) detects the presence of the test tube and automatically the vibration is activated.

VORTEX “WIZARD”is featured by a low profile and ergonomic design which, combined with the used materials, assures a high stability and better comfort.

Provided with a double operational working mode, offers the possibility to change the frequency of the vibration:

- **Sensor** - an infrared system (IR) detects the presence of the test tube and automatically the vibration is activated ! No pressure needed by the lab operator !

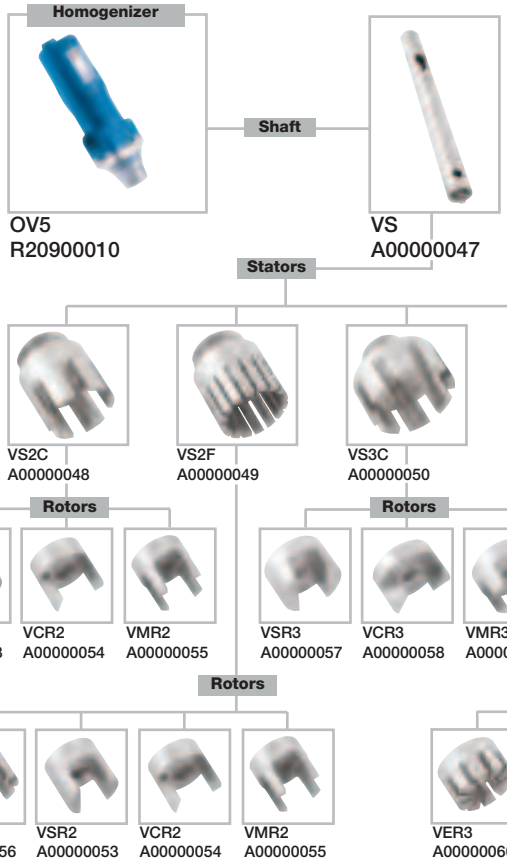
- **Continuous** – continuous operational mode combined with a large number of accessories.

VORTEX WIZARD comes standard with a cup for single test tube.

Vortex “Wizard” is a Patent Pending solution.

Homogenizer

Possible combinations



A stand alone solution for a wide range of applications

OV5 Homogenizer is the right solution for dispersing, homogenizing and mixing biological tissue samples (cells, animal and vegetal tissues), pharmaceutical products, cosmetics and food products.
It is a versatile instrument: the same model of shaft suitable for all the applications and configurable with different models of rotor and stator, for the specific application of the customer.

Choose the most suitable dispersing tool

Model	Code No	Application fields	Function	Treatable volume (water) ml	Max circum. speed m/s	Ø rotor mm	Ø stator mm	Tool lenght mm	min/max emersion depth mm	Ultimate fineness µm suspension	Ultimate fineness µm emulsion
*VSS2CSR2	A00000026	CE,IF,PC,SI	A	10 - 5000	22,7	15	20	220	40/175	10 - 50	1- 10
VSS2CCR2	A00000027	CT,IA,IT,M,SI,	B	10 - 5000	22,7	15	20	220	40/175	10 - 50	1- 10
VSS2CMR2	A00000028	CE,VE	A	10 - 5000	22,7	15	20	220	40/175	10 - 50	1- 10
*VSS2FER2	A00000029	CT,IF,SI,VE	C	10 - 5000	22,7	15	20	220	40/175	10 - 50	1- 10
VSS2FCR2	A00000031	BT,CT,IA,IT,M,SI,	B	10 - 5000	22,7	15	20	220	40/175	10 - 150	1- 10
VSS2FMR2	A00000032	CE,CT,IA,IC,PC,VE,	A	10 - 5000	22,7	15	20	220	40/175	10 - 150	1- 10
*VSS3CSR3	A00000033	CT,IA,IF,M,SI	A	100-8000	34,9	23	30	220	40/175	5 - 25	1 - 5
VSS3CCR3	A00000034	CT,IA,IF,M,SI	B	100-8000	34,9	23	30	220	40/175	5 - 25	1 - 5
VSS3CMR3	A00000035	CE,VE	A	100-8000	34,9	23	30	220	40/175	5 - 25	1 - 5
VSS3CMR2	A00000036	CE,IA,SI	D	250-20000	34,9	15	30	220	40/175	High speed mixer	
*VSS3FER3	A00000037	CT,IF,SI,VE	C	100-8000	34,9	23	30	220	40/175	5 - 25	1 - 5
VSS3FSR3	A00000038	CT,IF,SI,VE	A	100-8000	34,9	23	30	220	40/175	5 - 25	1 - 5
VSS3FMR3	A00000040	CE,IA,IC,IF,IT	A	100-8000	34,9	23	30	220	40/175	5 - 25	1 - 5
*VSS4CMR3	A00000041	CE,IA,SI	D	1000-40000	34,9	23	40	220	40/175	High speed mixer	
**VSS5CSR4	A00000046	BT,M	A	0,2-50	6,3	4	5	128	10/60	10-50	1-10

* Most used model
** The dispersing tool works with Ø 4 mm rotor and Ø 5 mm stator for microbiological applications (i.e. suitable for Eppendorf, cuvettes,etc.)

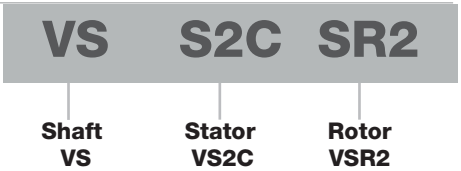
APPLICATION FIELD

BT	BIOTECHNOLOGY
CE	CERAMIC INDUSTRY
CH	CHEMICAL INDUSTRY
CT	PAPER & TISSUE INDUSTRY
IA	FOOD INDUSTRY
IC	COSMETICS INDUSTRY
IF	PHARMA INDUSTRY
IT	TOBACCO INDUSTRY
M	MEDICINE
PC	PETROCHEMISTRY INDUSTRY
SI	SEWAGE POLLUTION CONTROL
VE	PAINT INDUSTRY

FUNCTION

A	DISPERSING TOOL FOR SOLID/LIQUID MEDIA
B	DISPERSING TOOL WITH KNIFES FOR FIBROUS/STRINGY
C	DISPERSING TOOL FOR W/O OR O/W EMULSIONS
D	STIRRING SHAFT

LEGEND
Example model composition:
VSS2CSR2



OV5

Technical Data

Construction material:	technopolymer
Speed range:	from 10000 to 30000 rpm
Stirring volume max (H_2O):	up to 8 liters as homogenizer
Stirring volume max (H_2O):	up to 40 liters as high speed mixer
Max viscosity (mPa.s):	up to 10000
Power:	500 W
Weight:	1,3 Kg (2.9 lb)
Dimension (WxHxD):	70x255x70 mm (2.7x10x2.7 in)

Safety devices:
- Overload protection
- Smooth start- up
- Safety switch

Homogenizer

The OV5 homogenizer is composed by a smooth motor that permits to work in a very safe and comfortable way.

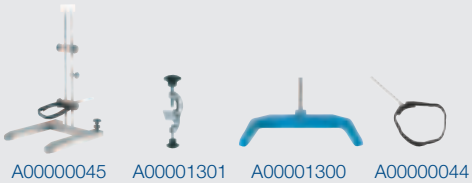
Top speed of high 30000 rpm rate, reduces processing time significantly. Smooth start prevents unnecessary spills and an additional feature of automatic overload protection increases the life span of the motor.

SHAFT
The OV5 homogenizer has only one shaft model suitable for all the applications and configurable with different models of rotors / stators. The shaft, thanks to the construction material stainless steel 316L and the PTFE sheats, grants a high resistance and durability.

ROTOR / STATOR PRINCIPLE
The rotor /stator system consists of a rotor which rotates at high speed within a stationary stator. The rotor and the stator have one or more rows of sharp-edged teeth. Because of the high rotor speed, the medium to be processed is automatically sucked axially into the dispersing head and is then pressed radially through the slots of the rotor-stator arrangement. The wide range of rotors / stators assures the most suitable solution for the different applications.

Instruments	Power Supply	Code No
OV5	230 V / 50 Hz	R20900010

Optional Accessories	Code No
H-stand with strap clamp, bosshead clamp	A00000045
Support rod and base	A00001300
Double clamp	A00001301
Strap clamp	A00000044
VS Shaft for homogenizer	A00000047
VS2C Coarse stator 20 mm	A00000048
VS2F Fine stator 20 mm	A00000049
VS3C Coarse stator 30 mm	A00000050
VS3F Fine stator 30 mm	A00000051
VS4C Coarse stator 40 mm	A00000052
VSR2 Standard rotor 20 mm	A00000053
VCR2 Cutter rotor 20 mm	A00000054
VMR2 Mixing rotor 20 mm	A00000055
VER2 Emulsifying rotor 20 mm	A00000056
VSR3 Standard rotor 30 mm	A00000057
VCR3 Cutter rotor 30 mm	A00000058
VMR3 Mixing rotor 30 mm	A00000059
VER3 Emulsifying rotor 30 mm	A00000060



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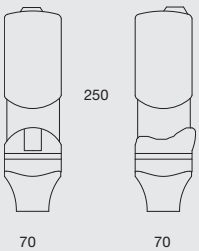



VELP
SCIENTIFICA

Food&Feed Line

Foods are all substances that supply energy and the components essential for growth and preservation of the vital functions when ingested. Their compositions must be defined in terms of proteins, carbohydrates and fats for their nutritional content, in conformity with the international standards.
The innovative equipment manufactured by VELP Scientifca provides substantial assistance to food and feed specialists involved in production and research.

Index

KJELDAHL METHOD FOR NITROGEN QUANTITATIVE DETERMINATION

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.

Thanks to 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 used as the **official method** for determining nitrogen and protein contents in:
- Foods (raw materials and finished products – e.g. milk, cereals, meat, etc.);
- 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, suction and fume neutralization systems and distilliation/titration units.

The method's principle
The Kjeldahl method lets you determine the nitrogen content of organic and inorganic substances.
Three main phases stand out:

1) Digestion
The sample is heated at a high temperature after having been mixed with concentrated sulfuric acid and other reagents. An ammonium sulfate solution is obtained from this reaction.

2) Distillation
The sulfuric acid used for the digestion is neutralized with concentrated sodium hydrate solution. By adding an excess of alkali, the balance is shifted from ammonium ions to free ammonia (NH3) which separates through distillation in a current of steam and is collected in a suitable solution.

3) Titration
The quantitative determination of the ammonia produced can be done by means of acid base titration (colorimetric, potentiometric, etc.) or other systems. Afterwards, it will be easy to calculate the quantity of nitrogen (% proteins).

Description	DK 6	DK 8S	DK 20S
Power Supply	230V or 115V	230V or 115V	230V
Power W	1100	1350	2300
Dimensions (WxHxD) mm (in)	293x152x339 (11,5x6x13,3)	233x152x448 (9x6x17,6)	328x152x518 (13x6x20,4)
Weight Kg (lb)	10 (22)	11 (24,2)	22,5 (49,5)
Display LCD	YES	YES	YES
N° of samples	6 samples in 300ml test tubes with Ø 42mm	8 samples in 300ml test tubes with Ø 42mm	20 samples in 300ml test tubes with Ø 42mm
Temperature range	from room temp. to 450°C	from room temp. to 450°C	from room temp. to 450°C
Temeprature precision	± 0,5°C	± 0,5°C	± 0,5°C
Temperature measurement unit	°C or °F	°C or °F	°C or °F
Digestion time range	from 001 to 999 minutes	from 001 to 999 minutes	from 001 to 999 minutes
N°of programs	20	20	20
Temperature ramps	from 1 to 4 ramps for each program	from 1 to 4 ramps for each program	from 1 to 4 ramps for each program
Acoustic signal at the end of the cycle with an automatic switching off	YES	YES	YES
Interface	RS232	RS232	RS232

Digesters

Digesters with programmable temperature ramps

The mineralization units of the DK series are designed for digesting solid and liquid samples in order to determine the nitrogen/protein content according to the Kjeldhal method.
The digesters are made up of a heating block in aluminum that offers excellent thermal homogeneity, with a maximum working temperature of 450°C. The block's temperature is controlled by dedicated microprocessor electronics. The temperature probe does not require calibration since the electronics sees to its self-calibration every time the device is turned on. All of this makes it possible to obtain excellent test precision and repeatability.
You can select up to 20 work programs with 4 temperature ramps for each program. In compliance with the GLP (Good Laboratory Practices), the data referring to the tests being run can be sent to a printer or PC for storage.

All Velp Scientifica digesters have a special tube and fume hood support system able to help cool the samples, make their treatment safer and save space.
In order to neutralize the fumes produced during the digestion, the DK digesters should be combined with a proper aspiration pump and fumes neutralization system.
Velp suggests the use of the DK digester in combination with the JP pump and the SMS scrubber unit.

Velp Scientifica offers a complete range of digesters able to house tubes of different sizes for Kjeldhal analyses (Ø 42mm volume max 300 ml) and for micro-Kjeldhal analyses (Ø 26mm volume max 100 ml).

Technical Data DK Series

Stainless steel structure protected by special resin and paints giving a high resistance to chemicals and mechanical corrosion.

Selectable language:	I, F, UK, E, D, T
Set temperature:	display visualization
Temperature range:	from room temperature to 450°C
Temperature autocalibration	
Digestion time range:	from 001 to 999 minutes or in continuous
Countdown:	display visualization
Time selection:	1 minute

Display visualization of the reached temperature and remaining time

PERFORMANCES

Stability of the heating block temperature:	±0,5°C
Homogeneity of the heating block temperature:	±0,5°C
Precision of the heating block temperature:	±0,5°C

SAFETY

Against overtemperature:	thermostat
Damaged temperature probe:	shown on display and acoustic signal

According to

AOAC | EPA | DIN | ISO

Velp solution for KJELDAHL analysis

DK 20	DK 20/26	DK 42/26	DK 6/48
230V	230V or 115V	230V	230V or 115V
2300	1100	2300	1100
393x152x446 (15,5x6x17,6)	293x152x339 (11,5x6x13,3)	393x152x446 (15,5x6x17,6)	293x152x339 (11,5x6x13,3)
24 (52,8)	10 (22)	24,5 (53,9)	8,2 (18)
YES	YES	YES	YES
20 samples in 300ml test tubes with Ø 42mm	20 samples in 100ml test tubes with Ø 26mm	42 samples in 100ml test tubes with Ø 26mm	6 samples in 300ml test tubes with Ø 48mm
from room temp. to 450°C	from room temp. to 450°C	from room temp. to 450°C	from room temp. to 450°C
± 0,5°C	± 0,5°C	± 0,5°C	± 0,5°C
°C or °F	°C or °F	°C or °F	°C or °F
from 001 to 999 minutes	from 001 to 999 minutes	from 001 to 999 minutes	from 001 to 999 minutes
20	20	20	20
from 1 to 4 ramps for each program	from 1 to 4 ramps for each program	from 1 to 4 ramps for each program	from 1 to 4 ramps for each program
YES	YES	YES	YES
RS232	RS232	RS232	RS232

DK 6

DK 6

Number of samples:	6 holes for Ø 42 mm test tube
Power:	1100W
Weight:	10 Kg (22 Lb)
Dimension (WxHxD):	293x152x339 mm (11.5x6x13.3 in)

Digester with programmable temperature ramps model DK6

The DK 6 model is able to house 6 test tubes of 300 ml with the diameter of 42 mm. The digester DK6 is made up of a aluminum heating block that offers excellent thermal homogeneity, with a maximum working temperature of 450°C.

In order to neutralize the fumes produced during the digestion, DK6 should be combined with a proper aspiration pump and fumes neutralization system. Velp suggests the use of the DK6 in combination with the JP pump and the SMS scrubber unit.

The "Operating Accessories" indicated below are necessary for the correct functioning of the instruments

Instruments	Power Supply	Code No
DK 6	230 V / 50 – 60 Hz	F30100182
DK 6	115 V / 50 – 60 Hz	F30110182

Operating Accessories	DK6
Test tubes Ø 42x300 mm, 3 pcs/box	A00000144*
Glassware handle with heat shields	A00001111
Suction cap	A00001096
Support system	A00001206

Optional Accessories	DK6
Stainless steel drop collector	A00001200
Stainless steel stand for glassware handle	A00001097
Printer	A00001009
Null modem connector for printer	A00000010
Serial cable	A00000005
IQ/OQ Manual DK	A00000075

Accessories for COD analysis	DK6
COD test tubes Ø 42x200mm, 200 ml, 3pcs/box	A00000145*
Air refrigerator with ground cone	A00001041
Antisplash bells	A00001045
PTFE sheats for 29/32 cones	A00001042
Stainless steel stand for glassware handle for COD	A00001049

* for the correct functioning of the DK6 two boxes are necessary


A00000144


A00001111


A00001096


A00001200


A00001097


A00001206


A00000145


A00001009


A00000010


A00000005

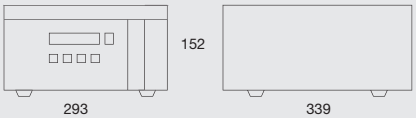

A00000075

A00001041


A00001042

A00001045


A00001049



DK 20

DK 20

Number of samples:	20 holes for Ø 42 mm test tube
Power:	2300W
Weight:	24 kg (52,8 Lb)
Dimension (WxHxD):	393x152x446 mm (15.5x6x17.6 in)

Digester with programmable temperature ramps model DK20

The DK20 model is able to house 20 test tubes of 300 ml with the diameter of 42 mm. The digester DK 20 is made up of a aluminum heating block that offers excellent thermal homogeneity, with a maximum working temperature of 450°C.

In order to neutralize the fumes produced during the digestion, DK20 should be combined with a proper aspiration pump and fumes neutralization system. Velp suggests the use of the DK20 in combination with the JP pump and the SMS scrubber unit.

The "Operating Accessories" indicated below are necessary for the correct functioning of the instruments

Instruments	Power Supply	Code No
DK 20	230 V / 50 – 60 Hz	F30100184

Operating Accessories	DK20
Test tubes Ø 42x300 mm, 3 pcs/box	A00000144*
Glassware handle with heat shields	A00001112
Suction cap	A00001093
Support system	A00001204

Optional Accessories	DK20
Stainless steel drop collector	A00001202
Stainless steel stand for glassware handle	A00001094
Printer	A00001009
Null modem connector for printer	A00000010
Serial cable	A00000005
IQ/OQ Manual DK	A00000075

Accessories for COD analysis	DK20
COD test tubes Ø 42x200mm, 200 ml, 3pcs/box	A00000145
Air refrigerator with ground cone	A00001041
Antisplash bells	A00001045
PTFE sheats for 29/32 cones	A00001042
Stainless steel stand for glassware handle for COD	A00001098

* for the correct functioning of the DK20 seven boxes are necessary


A00000144


A00001112


A00001093


A00001204


A00001202


A00001094


A00001009


A00000145

A00001041

A00001045

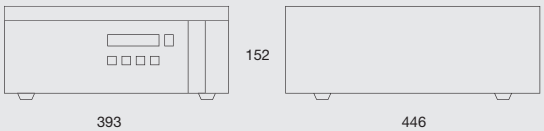

A00000075


A00001098


A00000010


A00000005


A00001042



DK 8S - DK 20S

DK 8S

Number of samples:	8 holes for Ø 42 mm test tube
Power:	1350W
Weight:	11 Kg (24,2 lb)
Dimension (WxHxD):	233x152x448 mm (9x6x17,6 in)

DK 20S

Number of samples:	20 holes for Ø 42 mm test tube
Power:	2300W
Weight:	22,5 kg (49,5 lb)
Dimension (WxHxD):	328x152x518 mm (13x6x20,4 in)

The "Operating Accessories" indicated below are necessary for the correct functioning of the instruments

DK SLIM DIGESTERS

The DK8S and DK20S model are able to house 8 and 20 test tubes of 300 ml with the diameter of 42 mm respectively. They have a very compact size aimed to meet the most demanding laboratories needs in terms of space saving. The digesters are made up of aluminum heating block that offers excellent thermal homogeneity, with a maximum working temperature of 450°C.
The block's temperature is controlled by dedicated microprocessor electronics. The temperature probe does not require calibration since the electronic automatic calibrates the device every time is turned on. All of this makes it possible to obtain excellent test precision and repeatability. DK8S and DK20S are provided with a wide range of options (temperature selections, programmable permanence time, "continuous" working mode availability) and with a visualization display which allows to set the desired values and to monitor the digestion progress.
In compliance with GLP (Good Laboratory Practices), the data referring to the tests being run can be sent to a printer or PC for storage.

In order to neutralize the fumes produced during the digestion, DK8S and DK20S should be combined with a proper aspiration pump and fumes neutralization system. Velp suggests the use of the Digesters in combination with the JP pump and the SMS scrubber unit.

Instruments	Power Supply	Code No
DK 8S	230 V / 50 – 60 Hz	F30100020
DK 8S	115 V / 50 – 60 Hz	F30110020
DK 20S	230 V / 50 – 60 Hz	F30100181

Operating Accessories	DK 8S	DK 20S
Test tubes Ø 42x300 mm, 3 pcs/box	A00000144*	A00000144**
Glassware handle & heat shields system	A00000063	A00001114
Suction cap	A00000065	A00001093
Support system	A00000064	A00000023

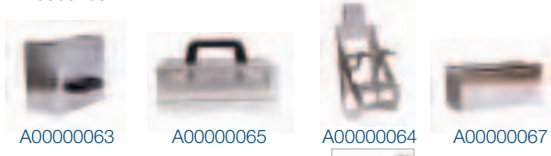
Optional Accessories	DK 8S	DK 20S
Stainless steel drop collector	---	A00001202
Stainless steel stand for glassware handle	A00000067	A00001094
Printer	A00001009	A00001009
Null modem connector for printer	A00000010	A00000010
Serial cable	A00000005	A00000005
IQ/OQ Manual DK	A00000075	A00000075

* for the correct functioning of the DK8S, three boxes are necessary

** for the correct functioning of the DK20S, seven boxes are necessary


A00000144 A00001093 A00001202


A00001094 A00001009 A00000010 A00000005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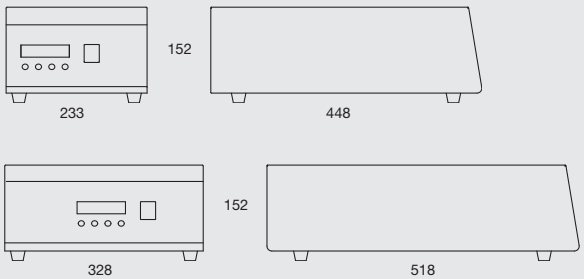
A00001114 A00000023 A00000075



DK 6/48 - DK 20/26 DK 42/26

DK 20/26

Number of samples:	20 test tubes Ø 26mm
Power:	1100W
Weight:	10 Kg (22 lb)
Dimension (WxHxD): 293x152x339 mm (11.5x6x13.3 in)	

DK 42/26

Number of samples:	42 test tubes Ø 26mm
Power:	2300W
Weight:	24,5 kg (53,9 lb)
Dimension (WxHxD): 393x152x446 mm (15.5x6x17.6 in)	

DK 6/48

Number of samples:	6 test tubes Ø 48mm
Power:	1100W
Weight:	8,2 kg (18 lb)
Dimension (WxHxD): 293x152x339 mm (11.5x6x13.3 in)	

In order to neutralize the fumes produced during the digestion, DK6/48, DK20/26 and DK42/26 should be combined with a proper aspiration pump and fumes neutralization system. Velp suggests the use of the Digesters in combination with the JP pump and the SMS scrubber unit.

Instruments	Power Supply	Code No
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	F30100186
DK 6/48	230 V / 50 – 60 Hz	F30100188
DK 6/48	115 V / 50 – 60 Hz	F30110188

Operating Accessories for DK 20/26	Code No
Test tubes Ø 26x300 mm, 6 pcs / box	A00000146*
Glassware handle with heat shields	A00001110
Suction cap	A00109626
Support system	A00001206

Operating Accessories for DK 42/26	Code No
Test tubes Ø 26x300 mm, 6 pcs / box	A00000146*
Glassware handle with heat shields	A00001109
Suction cap	A00109326
Support system	A00001204

Optional accessories for DK20/26 e DK 42/26	Code No
Printer	A00001009
Null modem connector for printer	A00000010
Serial cable	A00000005
IQ/OQ Manual DK	A00000075
Stainless steel for glassware handle DK20/26	A00001097
Stainless steel for glassware handle DK42/26	A00001094

Operating Accessories for DK 6/48	Code No
6 Test tubes Ø 48mm	A00001088
Glassware handle with heat shields	A00001113
Suction cap	A00001101
Support system	A00001206

Optional accessories for DK6/48	Code No
Drop collector	A00001200
Stainless steel stand for glassware handle	A00001097
Printer	A00001009
Null modem connector for printer	A00000010
Serial cable	A00000005
IQ/OQ Manual DK	A00000075

*for the correct functioning of the DK20/26 and DK42/26, four boxes and seven boxes are necessary respectively

The "Operating Accessories" indicated below are necessary for the correct functioning of the instruments


A00001110


A00109626
A00109326


A00001206


A00001109


A00001204


A00001009


A00000010


A00000005


A00001094


A00001097


A00000075


A00001088


A00001113


A00001101


A00001200


A00000146

JP

Technical Data

Air flow max.:	35 l/min
Flow regulation:	from 0 to 35 l/min
Residual pressure with water temperature of 15°C:	35 mmHg
Power:	160W
Weight:	8,4 Kg (18,5 lb)

Dimension (WxHxD): 250x400x370 mm (9.8x15.7x14.6 in)

Benefits

Automatism and optimization of the sucking power

Strongly reduced water consumption in comparison to water jet pumps connected to tap

Possibility of avoiding emission into the atmosphere of gaseous pollutants or polluted waters into drainages

Independent from tap water contingencies like low water availability or low pressure

JP recirculating water pump for fumes aspiration

Recirculating water pump that lets you select two different timed modes for the DK6 or DK20 digesters, ensuring optimum removal depending on the digestion phases and on the number of samples in the digester the pump is connected to.

Use of common water pumps is frequently prevented by the lack of adequate water mains pressure or by its high consumption. The unit developed by VELP consists of a ABS structure, which is highly resistant to chemical corrosion, and a tank where the water introduced is recirculated continuously, offering considerable savings on water.

The type and quality of the materials used make the instrument extremely quiet and long-lasting, and guarantee a high flow rate (up to 35 l/min).

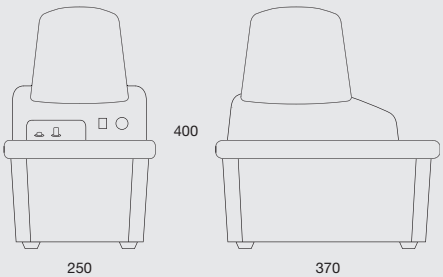
Special technical devices such as the level tank for checking the water, the cock for emptying the tank and two convenient handles for handling help the operator during use.

Combined with the special Velp SMS Scrubber (Code F307C0199), it provides the ideal complement to achieve highly effective fumes neutralization developed during acid digestions.

Instruments	Power Supply	Code No
JP	230 V / 50 Hz	F30620198
JP	230 V / 60 Hz	F30630198
JP	115 V / 60 Hz	F30640198

Complete of:	Code No
Viton tube Ø 10x14 mm (m 1,2)	10001097

10001097



SMS

Technical Data

Epoxy painted inox structure studied and tested in order to give to the instrument an excellent resistance to attacks from chemical agents

Capacious containers for the neutralization solution and for the condensate collection

Weight: 3,5 Kg (7,7 lb)

Dimension (WxHxD): 300x500x190 mm (11.8x19.7x7.5 in)

Benefits

A highly efficient neutralization, due to the optimized gas-liquid contact

Used for both basic and acid neutralization

The apparatus is safe and practical to use

Disposal of condensates, control and replacement of neutralizing solution are very simple

SMS Scrubber

The SMS Scrubber is designed to neutralize corrosive and toxic fumes that develop during oxidative mineralizations or other processes.

The system is supplied in the configuration consisting of two stages:
- condensation
- neutralization

The instrument can be supplied with a third (optional) stage, which is generally used with samples that generate high amounts of fumes during digestion (e.g. soybean). The unit has a broad range of applications, from the Kjeldahl method to neutralization with acids and bases. Thanks to the elevated surface of contact between gas and liquid, the SMS provides effective cleaning of the fumes, preventing their hazardous emission into the laboratory and environment.

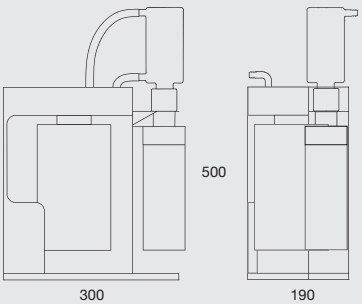
The unit attains its maximum effectiveness when combined with the VELP JP recirculating water pump for fumes removal (Code F30620198).

Instruments	Code No
SMS	F307C0199

Optional Accessories (for 3° stage)	Code No
Pack of 10 refill of activated carbon	A00001164
Filter for activated carbon	A00001165

A00001164

A00001165

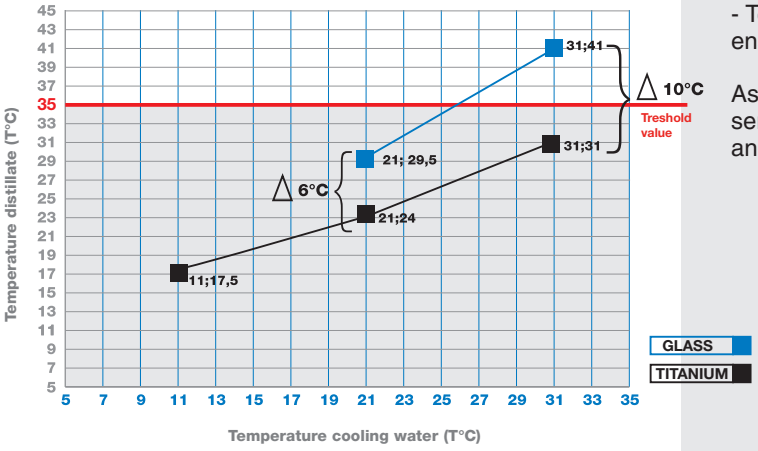


Distillation Units

Innovative Velp Scientifica titanium condenser

Velp Scientifica has developed and patented the innovative condenser made of composite material which is able to ensure high performance and considerable water savings.

The below graph shows the high efficiency of the new condenser compared to the traditional glass condenser found on the market.
It is important to note that while maintaining a constant water flow rate of 1 l/min at a high water temperature, the condenser made of composite material is able to take the temperature of the distillate to a value that is always below the threshold value (35°C), as indicated by the Kjeldahl method.
You can see in the graph that the condenser made of composite material allows us to attain a 31°C distillate temperature at a supply water temperature of 31°C; in comparison, the traditional glass condenser is able to produce a distillate with a temperature of 41°C (with the chance of losing nitrogen), supply water temperatures being equal.
The condenser's high efficiency lets the operator perform analysis with minimum water consumption. The remarkable heat exchange in fact lets us use a supply water flow rate of even 0.5 l/min for performing analysis correctly.



Test performed with a cooling water flow 1l/min.

VELP Scientifica offers a complete range of Distillation Units that can be programmed with different levels of automation and that are designed to meet the most diversified laboratory needs:

- Basic model	UDK 127
- Semi-automatic model	UDK 132
- Automatic model (with possibility of connection to an external titrator)	UDK 142
- Automatic model with integrated Titrator	UDK152

The distillation unit UDK Series are designed for a diversified and flexible use that includes applications such as determining ammoniacal nitrogen, protein nitrogen, (Kjeldahl or direct alkaline distillation), nitric nitrogen (after reduction), phenols, volatile fatty acids, TKN determination in the environmental industry, cyanides, sulfur dioxide, alcohol content, Devarda Nitrogen Determination etc. according to official procedures.

All of the UDK series distillation units have:

- Steam generator patented by Velp that uses deionized water and that is maintenance-free.
- Innovative titanium condenser (Patent Pending) that achieves outstanding heat exchange and higher resistance than glass, and that is easy to clean completely.
- Technopolymer splash head (alkali-resistant) that ensures a longer lifetime.

As an alternative, it is possible to order the UDK series of distillation units fitted with a splash head and condenser made of glass.

Description	UDK 127	UDK 132	UDK 142	UDK 152
Power Supply	230V or 115V	230V	230V	230V
Power W	2100 or 1700	2100	2100	2200
Dimensions mm (WxHxD) (in)	320x770x386 (12.6x30.3x15.2)	330x775x470 (13x30,5x18.5)	330x775x470 (13x30.5x18.5)	440x775x470 (17.3x30.5x18.5)
Weight Kg (lb)	23 (50,6)	33 (72,6)	35 (77)	45 (99)
Display LCD	YES	YES	YES	YES
Steam generator	Deionized /Distilled water	Deionized /Distilled water	Deionized /Distilled water	Deionized /Distilled water
Steam flow regulation	–	–	10 - 100%	10 - 100%
Distillation residues removal	Manual	Automatic	Automatic	Automatic
Number of programs	–	10	20	30 standard pre-defined 10 customizable
Language selection	–	YES	YES	YES
Dilution water addition	Manual	Automatic	Automatic	Automatic
Boric Acid addition	Manual	Manual	Automatic	Automatic
Sodium Hydroxide addition	Automatic	Automatic	Automatic	Automatic
Measuring range mg N	0,1 - 200	0,1 - 200	0,1 - 200	0,1 - 200
Reproducibility (RSD)	≤ 1%	≤ 1%	≤ 1%	≤ 1%
Recovery	≥ 99,5%at nitrogen levels between 1- 200 mg N	≥ 99,5%at nitrogen levels between 1- 200 mg N	≥ 99,5%at nitrogen levels between 1- 200 mg N	≥ 99,5%at nitrogen levels between 1- 200 mg N
Detection Limit	≥ 0,1 mg N	≥ 0,1 mg N	≥ 0,1 mg N	≥ 0,1 mg N
Interface	–	RS232	RS232	RS232, USB
Titration phase	–	–	Connection to external titrator	Integrated colorimetric titration system

UDK 127

Basic distillation unit model UDK 127

The new UDK 127 distillation unit comes with a patented steam generator that lets you carry out distillations in absolute safety and without routine maintenance.
The UDK 127 unit allows to run automatically the distillation time and sodium hidroxide addition.
The supply water feed is automatically interrupted during pauses, thus cutting down on its consumption.
The instrument is equipped with a system that recognizes when the sliding protection is not closed and when the test tube is present, without which the dosing pump does not start operation.
Use of an innovative system allows various sizes of test tubes to be used and 500 ml Kjeldahl flasks to be housed.

Technical Data

Stainless steel structure with complete plastic cover	
Distillation time:	5 minutes to collect 100 ml of distillate
Integrated Timer	
Display LCD	
Sodium hydroxide addition:	automatic
Sodium hydroxide volume:	0-100ml
Reproducibility (RSD):	≤1%
Recovery:	≥ 99,5% at nitrogen levels between 1- 200 mg N
Tap water consumption:	0,5 l/min at 15°C - 1 l/min at 30°C
Detection Limit:	≥ 0,1 mg N
Time related to start for Devarda alloy analysis:	0-99 minutes
Power:	2100W at 230V 1700W at 115V
Weight:	23 Kg (50.6 lb)
Dimension (WxHxD):	320x770x386 mm (12.6x30.3x15.2 in)

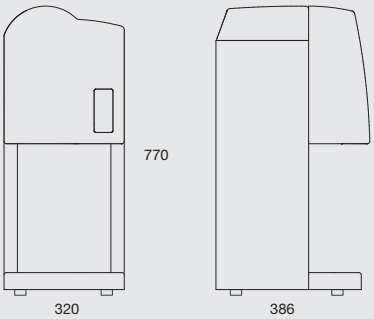
According to

AOAC | EPA | DIN | ISO

Instruments	Power supply	Code No
UDK 127	230 V / 50-60 Hz	F30200183
UDK 127	115 V / 50-60 Hz	F30210183

Complete of	Code No
Test tubes Ø 42x300 mm	A00001080
Collecting flask, 250 ml	10001106
Set of tubes	40001182
Pincer for test tubes	10000247
Inlet tube	10000280

Optional Accessories	Code No
Test tube Ø 80x300 mm for alcohol determination	A00001083
Spacer for test tube Ø 48x260 mm	A00000062
Test tube connection Ø 26 mm, Ø 48 mm and 500 ml Kjeldahl balloon	A00000043
Test tube Ø 48x260 mm, 300 ml	A00001088
Test tube Ø 26x300 mm, 100 ml, 6 pcs/box	A00000146
Test tube Ø 42x300 mm, 300 ml, 3 pcs/box	A00000144
IQ/OQ/PQ UDK127 Manual	A00000072




A00001088


A00000144


A00000146


A00000072

UDK 132

Technical Data

Epoxy painted inox steel structure studied and tested in order to give to the instrument an excellent resistance to attacks from chemical agents and mechanical agents and to corrosion in general

Distillation time:	4 minutes to collect 100 ml of distillate
Sodium hydroxide addition:	automatic
Dilution water addition:	automatic
Sodium hydroxide volume:	0-100ml
Dilution water volume:	0 – 200 ml
Reproducibility (RSD):	≤1%
Recovery:	≥ 99,5% at nitrogen levels between 1- 200 mg N
Tap water consumption:	0,5 l/min at 15°C - 1 l/min at 30°C
Detection Limit:	≥ 0,1 mg N
Time related to start for Devarda alloy analysis:	0-30 minutes
Power:	2100W
Weight:	33 Kg (72,6 lb)
Dimension (WxHxD):	330x775x470 mm (13x30.5x18.5 in)

Instruments	Power Supply	Code No
UDK 132	230 V / 50 - 60Hz	F30200189

RS232

Complete of	Code No
Test tube Ø 42x300 mm	A00001080
Collecting flask 250 ml	10001106
Set of tubes	40001182
Pincer for test tubes	10000247
Inlet tube	10000280


A00001080

10001106


40001182


10000247


10000280

Optional Accessories	Code No
Test tube Ø 80x300 mm for alcohol determination	A00001083
Spacer for test tube Ø 48x260 mm	A00000062
Test tube connection Ø 26 mm, Ø 48 mm and 500 ml Kjeldahl balloon	A00000043
Test tube Ø 48x260 mm	A00001088
Keyboard	A00000009
Printer	A00001009
Test tubes Ø 42x300 mm, 300 ml, 3pcs/box	A00000144
Test tubes Ø 26x300 mm, 100 ml, 6 pcs/box	A00000146
IQ/OQ/PQ UDK132 Manual	A00000071


A00001083


A00000043


A00000062


A00000009


A00001009


A00001088


A00000144


A00000146

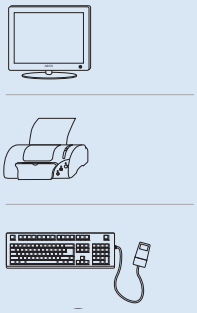

A00000071

UDK 132

Semi-automatic distillation unit model UDK 132

The distillation unit comes with a patented steam generator using deionized water that allows to carry out distillations in absolute safety and without routine maintenance.
Distillation unit equipped with automation of the various operational phases, with high reliability and safety characteristics. The supply water feed is automatically interrupted during pauses, thus cutting down on its consumption.
The instrument is equipped with a system that recognizes when the sliding protection is not closed, when there is not enough cooling water and when the test tube is present, without which the instrument does not start operation.
Use of an innovative system allows various sizes of test tubes to be used and 500 ml Kjeldahl flasks to be housed.
10 customizable methods are available for the most significant distillation parameters, and access to the programming menus in 5 different languages is simple and intuitive.
In conformity with the G.L.P. (Good Laboratory Practices), the instrument can be connected to a printer or PC in order to print or store the data concerning the tests in progress.

Can be connected to

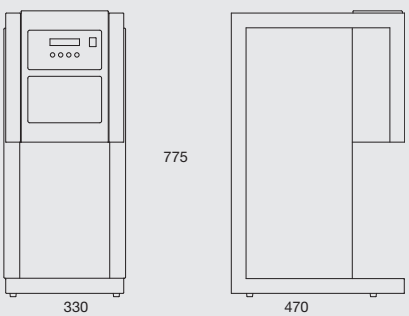


UDK 132 Semi-automatic distillation unit

According to

AOAC | EPA | DIN | ISO

High performance and considerable water savings thanks to the innovative condenser. (Patent Pending)



UDK 142

Technical Data

Epoxy painted inox steel structure studied and tested in order to give to the instrument an excellent resistance to attacks from chemical agents and mechanical agents and to corrosion in general

Distillation time:	3 minutes to collect 100 ml of distillate
Sodium hydroxide addition:	automatic
Dilution water addition:	automatic
Boric acid addition:	automatic
Sodium hydroxide volume:	0 – 100 ml
Dilution water volume:	0 – 200 ml
Boric acid volume:	0 – 100 ml
Steam flow regulation:	10 – 100%
Reproducibility (RSD):	≤1%
Recovery:	≥ 99,5% at nitrogen levels between 1- 200 mg N
Tap water consumption:	0,5 l/min at 15°C - 1 l/min at 30°C
Detection Limit:	≥ 0,1 mg N
Time related to start for Devarda alloy analysis:	0-30 minutes
Power:	2100W
Weight:	35 Kg (77 lb)
Dimension (WxHxD):	330x775x470 mm (13x30.5x18.5 in)

Instruments	Power supply	Code No
UDK 142	230 V / 50 - 60 Hz	F30200191

Complete of	Code No
Test tube Ø 42x300 mm	A00001080
Collecting flask 250 ml	10001106
Set of tubes	40001182
Pincer for test tubes	10000247
Inlet tube	10000280
Keyboard	A00000009

Optional Accessories	Code No
Test tube Ø 80x300 mm for alcohol determination	A00001083
Spacer for test tube Ø 48x260 mm	A00000062
Test tube connection Ø 26 mm, Ø 48 mm and 500 ml Kjeldahl balloon	A00000043
Printer	A00001009
Connection cable for Mettler titrator	A00191200
Connection cable for Metrohm titrator (CTRL)	A00191201
Connection cable for Metrohm titrator (RS232)	A00191202
Connection cable for Schott titrator	A00191203
Titrator Titroline Easy K	R30800194*
Test tube Ø 48x260 mm	A00001088
Test tubes Ø 42x300 mm,300 ml, 3 pcs/box	A00000144
Test tubes Ø 26x300 mm, 100 ml, 6 pcs/box	A00000146
IQ/OQ/PQ UDK142 Manual	A00000070
Serial cable RS232	A00000005

* included the connection cable code No A00191203

RS232


A00001080

10001106


40001182


10000247


10000280


A00000009


A00001083


A00000043


A00000062


A00001088


A00001009


A00191200-A00191201
A00191202-A00191203


A00000005


A00000144


A00000146


R30800194

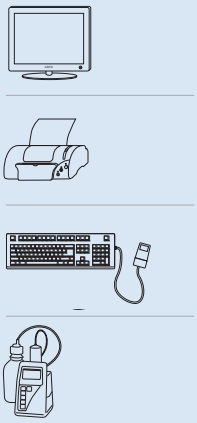

A00000070

UDK 142

Automatic distillation unit model UDK 142 with titrator connection

A distillation unit entirely automated in its various operational phases, with high reliability and safety characteristics.
The patented steam generator using deionized water allows to carry out fast or slow distillations, depending on the product to be analyzed.
The supply water feed is automatically interrupted during pauses, thus cutting down on its consumption.
The instrument is equipped with a system that recognizes when the sliding protection is not closed, when there is not enough cooling water, the reagents reserve and when the test tube is present, without which the instrument does not start operation.
Use of an innovative system allows various sizes of test tubes to be used and 500 ml Kjeldahl flasks to be housed.
As it can easily be connected to different automatic titrator models, the instrument lets you get the final result directly.
All parameters concerning the distillation and subsequent titration are programmable.
Accessing the **20 customizable methods** available in 5 different languages is simple and intuitive.
In conformity with the GLP (Good Laboratory Practices), the instrument can be connected to a printer and PC in order to print or store the data concerning the tests in progress.

Can be connected to

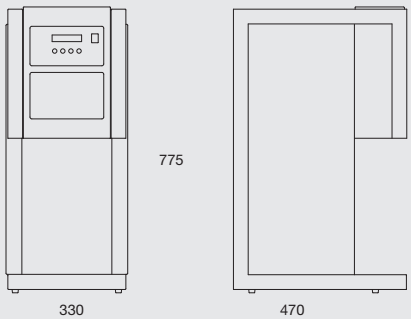


UDK 142 Automatic distillation unit

According to

AOAC | EPA | DIN | ISO

High performance and considerable water savings thanks to the innovative condenser. (Patent Pending)



UDK 152

Technical Data

Epoxy painted inox steel structure studied and tested in order to give to the instrument an excellent resistance to attacks from chemical agents and mechanical agents and to corrosion in general	
Distillation unit with integrated colorimetric titrator	
Time of analysis:	starting from 4 min
Sodium hydroxide addition:	automatic
Dilution water addition:	automatic
Boric acid addition:	automatic
Sodium hydroxide volume:	0 - 100 ml
Dilution water volume:	0 - 200 ml
Boric acid volume:	0 - 100 ml
Steam flow regulation:	10 -100%
Storage capacity:	up to 3500 values
Reproducibility (RSD):	≤ 1%
Recovery:	≥ 99,5%at nitrogen levels between 1- 200 mg N
Tap water consumption:	0,5 l/min a 15°C - 1 l/min a 30°C
Detection Limit:	≥ 0,1 mg N
Time related to start for Devarda alloy analysis:	0 – 30 min
Max burette standard volume:	25 ml
Min. burette volume:	0,002 ml/step
Power:	2200W
Weight:	45 Kg (99 lb)
Dimension (WxHxD):	440x775x470 mm (17.3x30.5x18.5 in)

Instruments	Power supply	Code No
UDK 152	230 V / 50 - 60 Hz	F30200192

Complete of	Code No
Test tube Ø 42x300 mm	A00001080
Collecting flask 250 ml	10001106
Set of tubes	40001182
Pincer for test tubes	10000247
Inlet tube	10000280
Keyboard	A00000009

Optional Accessories	Code No
Test tube Ø 80x300 mm for alcohol determination	A00001083
Spacer for test tube Ø 48x260 mm	A00000062
Test tube connection Ø 26 mm, Ø 48 mm and 500 ml Kjeldahl balloon	A00000043
Connection cable, RS232	A00000005
Printer	A00001009
Test tube Ø 48x260 mm	A00001088
Syringe 50 ml volume for UDK 152 burette	A00000066
Test tubes Ø 42x300 mm, 300 ml, 3 pcs/box	A00000144
Test tube Ø 26x300 mm, 100 ml, 6 pcs/box	A00000146
IQ/OQ/PQ UDK152 Manual	A00000069

RS232 USB


A00001080

10001106


40001182


10000247


10000280


A00000009


A00001083


A00000043


A00000062


A00001009


A00000005


A00001088


A00000144


A00000146


A00000066


A00000069

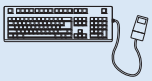
UDK 152

Automatic distillation and titration system model UDK 152

The UDK 152 distillation unit is a new advanced analytical solution complete with integrated colorimetric titrator that is able to get precise and accurate results.
The distillation unit has a control panel with graphic display, integrated alphanumeric keyboard and easy-to-use multitasking software that guides the operator step by step inside the menus and sub-menus.
Analysis time is cut thanks to the optimization of the applications: **30 pre-defined official methods** are stored in the UDK 152, and it is also possible for the user to directly input **10 customizable methods**.
The distillation unit comes with a patented steam generator using deionized water that is able to carry out distillations in absolute safety and without routine maintenance; an internal automatic device also reduces cooling water consumption. UDK 152 is provided with the innovative condenser made of titanium (Patent Pending) that offers efficient heat exchange with remarkable supply water savings, and a technopolymer splash head that ensures a high degree of resistance over time.
The UDK152 distillation unit provides the highest safety standards: indication there is no tube present, tube change at the end of the analysis, the sliding protection is not closed, absence of reagents and insufficient cooling water.
Easily connected to different models of balances, insertion of weights and volumes of the samples is quick and easy, without transcription errors.
The distillation unit directly calculates the percentage of nitrogen and proteins, and is able to store up to 3500 values.
Use of an innovative system allows various sizes of test tubes to be used and 500-ml Kjeldahl flasks to be housed.
In conformity with the GLP (Good Laboratory Practices), the distillation unit can be connected to a printer and PC in order to print and store the data concerning the tests in progress.

Can be connected to



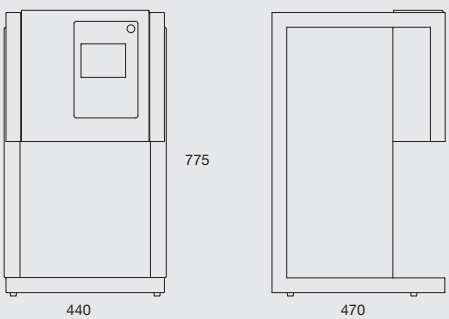



UDK 152 Automatic Disitllation & Titration unit

According to

AOAC | EPA | DIN | ISO

High performance and considerable water savings thanks to the innovative condenser. (Patent Pending)



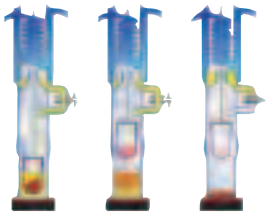
Solvent extractors

SOLVENT EXTRACTION

Solvent extraction is used for determining different components of products derived from agriculture, industry or contained in environmental samples. Soxhlet extraction is one of the most widely used analytical techniques. It has been slightly altered in different aspects, in some cases in the attempt to increase the temperature of the solvent coming into contact with the mixture to be extracted, in order to cut the extraction time. The modifications introduced by American chemist Edward L. Randall are some of the most effective for this purpose.
Velp Scientifica solvent extractors operate in accordance with the Randall technique.

New thimbles for solvent extraction
Velp offers new thimbles for the SER 148 solvent extractor that are able to provide accurate and reproducible analytical results. Thanks to the use of the new accessories, the extraction cycle's performance is further improved owing to the extreme thinness (1 mm) that allows the solvent's flow through the thimble's wall to be faster. The above-mentioned thickness features and optimum pressing of the cellulose fibers make the surface of the new thimbles smooth and compact.
The new accessories (33 x 80 mm) are made of high quality cotton cellulose fiber.

Soxhlet technique
The solubilization of extractable components is performed by a cold solvent dropping from a reflux condenser. Consequently a complete extraction lasts many hours.



Randall technique
The first phase of extraction is performed by immersing a sample - containing thimble in boiling solvent followed by a washing with cold refluxing solvent. The fast solubilization achived by the hot solvent results in a sharp reduction of extraction time.

IP55 protection rating
The acronym IP " International Protection" denotes a standard international protection rating, and the number that follows (e.g. 55) indicates the electronic protection level of the instrument in accordance with the European CEI EN 60529 standard.
In particular, the first number (5 in the specific case of the SER) is, on a scale of 0 to 6, the level of protection against the accidental access of solid objects to the dangerous parts of the instrument.
The second number (5 in this case) indicates the level of protection against water penetration on a scale of 0 to 8.

Technical Data

Epoxy painted stainless steel structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general

2 Display showing:	working temperature / settable parameters
Safety devices:	2 different microprocessor controlled electronic circuits with Pt 100 probe, with an International protection IP 55
Max volume extraction cup:	150 ml
Warning signal for lacking of cooling water	
Working temperature:	from 100 to 260°C
Power SER 148/3:	500W
Power SER 148/6:	950W
Weight SER 148/3:	30 Kg (66 lb)
Weight SER 148/6:	40 Kg (88 lb)
Dimension (WxHxD) SER 148/3:	480x620x390 mm (18.9x24.4x15.4 in)
Dimension (WxHxD) SER 148/6:	700x620x390 mm (27.6x24.4x15.4 in)

PERFORMANCE

Shortening of extraction time	
Reproducibility (RSD):	≤1%
Solvent recovery:	from 50 to 75%

CONSUMPTIONS

Cooling water:	8 l/min
Sample quantity:	from 0,5 to 15 g (generally 2 - 3g)
Solvent volume:	from 30 to 100 ml

PROGRAMS

Number of programs:	29

SETTABLE PROGRAMS AND VALUES:

Working temperature:	from 100 to 260°C
Immersion time:	from 0 to 999 minutes
Washing time:	from 0 to 999 minutes
Recovery time:	from 0 to 999 minutes

SER 148/3
SER 148/6

Extractor for the quantitative separation of substances using solvent

The SER 148/3 and SER 148/6 units allow a substance or group of substances to be quantitatively separated (e.g. fat) from a mixture of solids or semisolids. Extraction is carried out in accordance with the Randall technique, which works in two phases (plus one to recover the distilled solvent).
This technique allows to protect against atmospheric pollution, and cut analysis costs and extraction time.
The instrument, designed to optimize ease of handling, is provided with a microprocessor that lets you set up to 29 different work programs. The operational phases set will be carried out in sequence with the temperature and remaining time constantly shown on two different displays.
The analyses are performed in absolute safety thanks to its IP55 protection rating.
The main fields of application include analysis of food products, animal feeds, detergents, rubber and plastic formulations, pharmaceutical products, soils, etc. for the content of soluble products such as, for example, fats, surface active agents, plasticizers and pesticides.

According to

AOAC | TAPPI | UNI | EPA
ASTM | APHA | AWWA | WEF

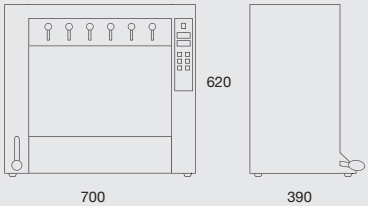
RS232

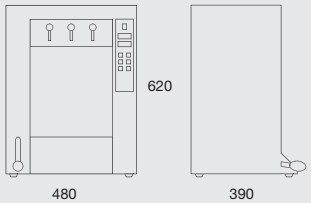
Instruments	Power supply	Code No
SER 148/3	230 V / 50 - 60 Hz	F30300240
SER 148/3	115 V / 50 - 60 Hz	F30310240
SER 148/6	230 V / 50 - 60 Hz	F30300242
SER 148/6	115 V / 50 - 60 Hz	F30310242

Complete of	Code No
Extraction cup (SER148/3, 3 pcs included)	A00001141
Extraction cups, 6 pcs/box (SER148/6)	A00000142
Extraction thimbles 33x80 mm, 25 pcs/box	CM0111148
Extraction thimbles holder	A00001142
Inlet tube	10000280
Heat shield (SER148/3)	40000210
Heat shield (SER148/6)	40000220
Viton seal	10000008
Butyl seal	10000009

Optional accessories	Code No
Printer	A00001009
Serial cable	A00000011
Handling device for extraction cups with integrated heat shield	A00001145*
Thimble weighing cup	A00001146
Pincer for weighing cups	A00001147*
Thimbles stand (6 places)	A00001149*
Vaflon seal	A00000061
Extraction cups, 6pcs/box	A00000142
IQ/OQ/PQ SER148 Manual	A00000073

*only for SER148/6 Model





RAW FIBER

Vegetables and commercial products deriving from them are made up of substances belonging to different categories:
- carbohydrates, proteins, fats, mineral salts;
- one non-digestible part consisting of polymers (lignin, cellulose, hemicellulose, pectin) called “fiber”.

There are many reasons why it is very important to determine the fiber content, and a few of the most important are:

NUTRITIONAL REASON

Human beings and animals need an intake of a certain quantity of fiber so that the digestive system works well. Its quantity must be carefully controlled since a high intake could cause problems of indigestibility, whereas a low intake could cause irregularities in the functioning of the digestive tract.

ECONOMIC REASON

Companies that manufacture foods and animal feeds use as much fiber as a raw material as they are allowed since it is a low-cost food product component.

LEGISLATIVE REASON

The authorities of almost all countries require manufacturers of packaged foods and animal feeds to declare the fiber content on the packaging as part of the nutritional table.

CRUCIBLES

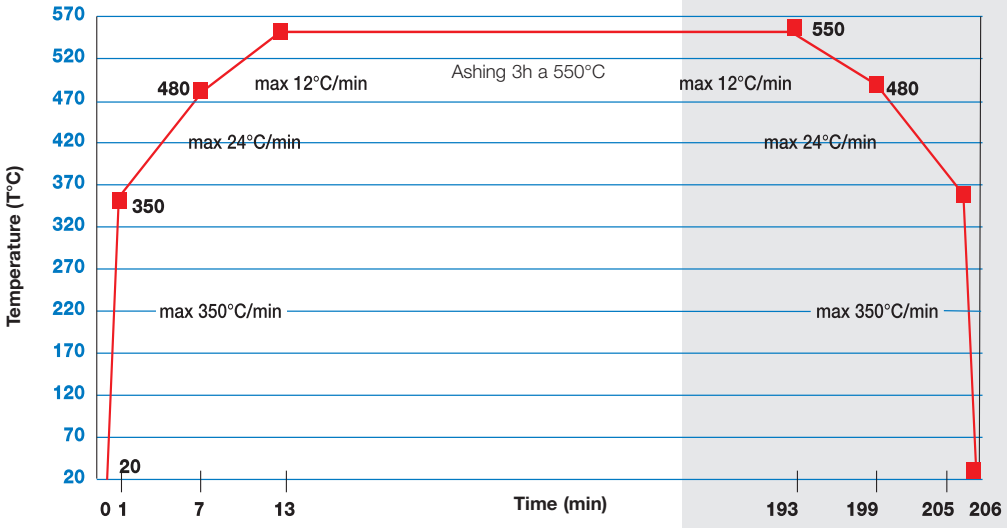
Crucibles are to be considered consumable, and their lifetime is closely tied to their use and proper cleaning. The average lifetime is 20-30 analyses.
Crucibles have class 2 porosity according to Jena’s definition, with 45 µm (40 – 60 µm) (ASTM) holes, class C in the USA.

In particular, the lifetime of crucibles is closely correlated with their proper use in the muffle furnace for analyzing ashes and their proper cleaning in keeping with what is recommended in the operating manual.

Tips for crucible treatment in a muffle furnace

The heating and cooling of glass crucibles for determining ash content require special care in order to keep them from breaking.
Both the heating and cooling of glass conducted at speeds that are too high induce tensions between the various parts that lead to breakage, particularly close to grazes or in particularly stressed areas such as, for example, the junction between the crucible body and the filter disk. Bear in mind that the temperature of 550° corresponds to the beginning of the plastic state of the glass, and therefore it should not be be exceeded.

MAXIMUM RATES FOR HEATING/COOLING GLASS CRUCIBLES



Recommendations for getting a constant weight
Crucibles removed from a stove or muffle furnace are to be cooled in a desiccator.
The guarantee that a sample has been completely dried is given by the obtainment of two identical weights performing two weighings at about half an hour from each other (constant weight).

Maximum rates recommended for heating and cooling glass crucibles are as follows:

Heating °C	Cooling °C	Rate °C/min	Required time
20 to 350	350 to 20	350	1
350 to 480	480 to 350	24	6
480 to 550	550 to 480	12	6

FIWE 3
FIWE 6

Technical Data

Epoxy painted steel structure studied and tested in order to give to the instrument an excellent resistance to the attack from chemical and mechanical agents and to corrosion in general

Cold and hot extractions

Air pump for sample removal

Peristaltic pump for reagent discharge

Timer with acoustic signal

Electronic regulation of temperature

All the extraction phases operated by rotating valves

Separated outlets for reagents and cooling water

Samples can be individually processed

Power FIWE3:	900W
Power FIWE6:	1200W
Weight FIWE3:	35 Kg (77 lb)
Weight FIWE6:	46 Kg (101.2 lb)
Dimension (WxHxD) FIWE 3:	530x620x390 mm (20.9x24.4x15.4 in)
Dimension (WxHxD) FIWE 6:	750x620x390 mm (29.5x24.4x15.4 in)

Extractors for raw fiber

Velp Scientifica has developed the FIWE 3 (3-position) and FIWE 6 (6-position) units for determining raw fiber. These instruments are designed to optimize the operator's ease of handling while ensuring high reproducibility of the analytical results.

PERFORMANCES

Sample quantity:	from 0.5 to 3.0 g
Reproducibility (RSD):	±1%
FIWE 3 operating capacity:	3 samples
FIWE 6 operating capacity:	6 samples

APPLICATIONS

Raw fiber (Weende, Wijstrom)
Neutral or acid detergent treatment fiber (Van Soest)
Lignin, Cellulose, Hemicellulose

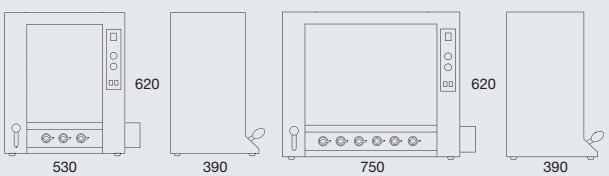
According to

AOAC AACC

Instruments	Power supply	Code No
FIWE 3	230 V / 50 Hz	F30520201
FIWE 3	230 V / 60 Hz	F30530201
FIWE 3	115 V / 60 Hz	F30540201
FIWE 6	230 V / 50 Hz	F30520200
FIWE 6	230 V / 60 Hz	F30530200
FIWE 6	115 V / 60 Hz	F30540200

Complete of	Code No
Heat shield (FIWE 3)	40000167
Heat shield (FIWE 6)	40000161
PVC tube (2 m)	10001086
Glass crucible (FIWE 3, 3 pcs included)	A00001140
Glass crucible, 6 pcs/box (FIWE 6)	A00000140
2 places hot plate, type RC2	F20700172
Reagent glass bottles	10001112
Pincer for crucibles	10000247
Holder for three crucibles (FIWE 3)	40000166
Holder for six crucibles (FIWE 6)	40000160
Inlet tube	10000280

Optional Accessories	Code No
Water spray device	A00001135
Glass crucible, 6 pcs/box	A00000140
IQ/OQ FIWE Manual	A00000074



COEX

Technical Data

Epoxy painted steel structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general

Type of extraction:	cold
Reagent discharge:	peristaltic pump
Power:	220W
Weight:	19 Kg (41.8 lb)

Dimension (WxHxD): 750x280x380 mm (29.5x11x15 in)

Cold extractor

The samples that have to be subjected to calculation of the raw fiber must have less than 1% fat content. If the fat content is greater than 1%, you have to carry out preliminary extraction using acetone, hexane or petroleum ether.
The coex instrument was developed in order make degreasing of the samples inside the crucibles that will then be used on the FIWE 3 or FIWE 6 for the consequent determination of raw fiber.

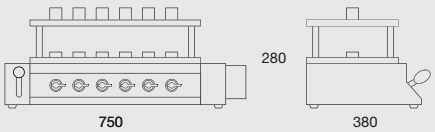
According to

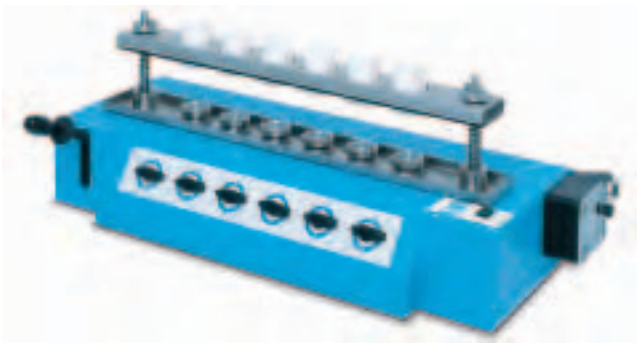
AOAC AACC

Instruments	Power supply	Code No
COEX	230 V / 50 Hz	F30520204
COEX	230 V / 60 Hz	F30530204
COEX	115 V / 60 Hz	F30540204

Complete of	Code No
Glass crucible, 6 pcs/box	A00000140

A00000140





CSF 6 - GDE

Technical Data

CSF 6

Epoxy painted steel structure studied and tested in order to give to the instrument an excellent resistance to the attack from chemical and mechanical agents and to corrosion in general	
Peristaltic pump with high suction capacity	
Electronic setting of counterpressure	
Separate residues collecting	
Shortening of filtration time:	20 minutes about (for 6 samples), whilst the AOAC method requires 3 hours
Power:	220W
Weight:	28 Kg (61,6 lb)
Dimension (WxHxD):	750x420x380 mm (28.7x16.5x15 in)

GDE

Temperature range:	from room temp. to 100°C
Power:	1000W
Weight:	12 Kg (26.4 lb)

Dimension (WxHxD): 410x500x295 mm (16.1x19.7x11.6 in)

Dietary fiber extractors

Dietary fiber includes cellulose, hemicellulose, lignin, pectin, rubbers and waxes. For determining dietary fiber by way of digestion with thermostable enzymes in foods and animal feeds, AOAC (Official Methods of Analysis) proposes enzymatic method 985.29.
Velp Scientifica has developed the GDE and CSF6 units in conformity with this method.

The GDE unit is the solution Velp Scientifica offers for getting even stirring of the sample and excellent thermoregulation precision during the delicate enzymatic digestion phase.

The CSF6 unit allows the final filtration and washing phase envisaged by the enzymatic method to be rationalized with considerable reduction of the time required.

What is the difference between dietary fiber and raw fiber?
It is basically an analytical type of difference.
Both the procedure for determining the dietary fiber and that for determining the raw fiber are aimed at calculating the indigestible residue of a food, or that is to say, everything that is not fats, proteins or carbohydrates.
Whereas the procedure for determining dietary fiber envisages using enzymes, that for determining raw fiber uses only chemical reagents (acids and bases).
The procedure for determining dietary fiber exposes the sample to a series of enzymatic digestions that simulate the real digestive process which takes place in the human and animal digestive tract, calculating the undigested residue remaining at the end of the analysis. The official analytical reference procedure is: AOAC 985.29. On the other hand, in analyzing raw fiber the sample is digested using diluted solutions of acids and bases, and here as well the final undigested residue of the starting food is measured. In this case the most widely used official procedure is the Weende method (official in Italy, France, England, Sweden and the USA).
Generally, dietary fiber analysis is carried out on foods intended for human nourishment, whereas raw fiber analysis is carried out on animal feeds or on raw materials of vegetable origin, e.g. cereals.

Instruments	Power supply	Code No
CSF6	230 V / 50 Hz	F30420210
CSF6	230 V / 60 Hz	F30430210
CSF6	115 V / 60 Hz	F30440210
GDE	230 V / 50 - 60 Hz	F30400209
GDE	115 V / 50 - 60 Hz	F30410209

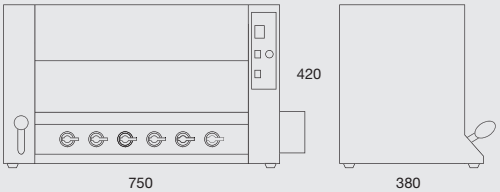
CSF6 Complete of:	Code No
Glass crucibles, 6 pcs/box	A00000140

GDE Optional Accessories	Code No
Beaker	A00000999


A00000140

A00000999


GDE




CSF 6

Laboratory aids

Products studied to simplify analytical operations

Catalyst tablets
Catalysts for accelerating, simplifying and standardizing oxidative mineralizations in nitrogen analyses according to Kjeldahl. The catalysts are packaged in pre-dosed tablets; this helps to prevent possible errors in the dosage of chemical substances and to speed up the analytical process considerably. They can easily be used in agricultural chemistry, clinical chemistry and petrochemistry, and for analyzing foods and animal feeds.

Nitrogen-free weighing boats
The weighing of syrupy substances, viscoses, pulps and in many cases also powders presents problems at the time of the quantitative transfer into mineralization test tubes. Weighing boats made of special nitrogen-free parchment can be mineralized with the sample while determining the organic nitrogen according to the Kjeldahl method.

Filter thimbles
Thimble filters for solvent extractors made of high quality cotton cellulose fiber. The thimble filters are 1 mm thick.

Catalyst tablets

Pack of 1000 pieces	Code No
Antifoam S - 0,97 g Na_2SO_4 - 0,03 g silicone	CT0006600
Kjeltabs MT - 3,5 g K_2SO_4 - 0,175 g HgO	CT0006602
Kjeltabs ST - 3,5 g K_2SO_4 - 0,0035 g Se	CT0006609
Kjeltabs W - 97,5 parts Na_2SO_4 - 1,5 parts $CuSO_4 \times 5H_2O$ - 1,0 parts Se, 5 g	CT0006613
Kjeltabs TCT - 3,5 g K_2SO_4 - 0,105 g $CuSO_4 \times 5H_2O$ – 0,105 g TiO_2	CT0006621
Kjeltabs CM - 3,5 g K_2SO_4 - 0,1 g $CuSO_4$ - $5H_2O$ (Missouri)	CT0006650

Nitrogen-free weighing boats

Pack of 100 pieces	Code No
58x10x10 mm	CM0486000
70x23x15 mm	CM0486001

Extraction thimbles

Pack of 25 pieces	Code No
33x80 mm	CM0111148

SHELF - LIFE

The reactions occurring between oxygen and several sensitive components of foods is one of the most important causes of quality alteration of food products. In particular, autoxidation (or growing rancid) of fats contained in foods is recognized as being one of the main factors conditioning the shelf life (commercial life) of the foods.

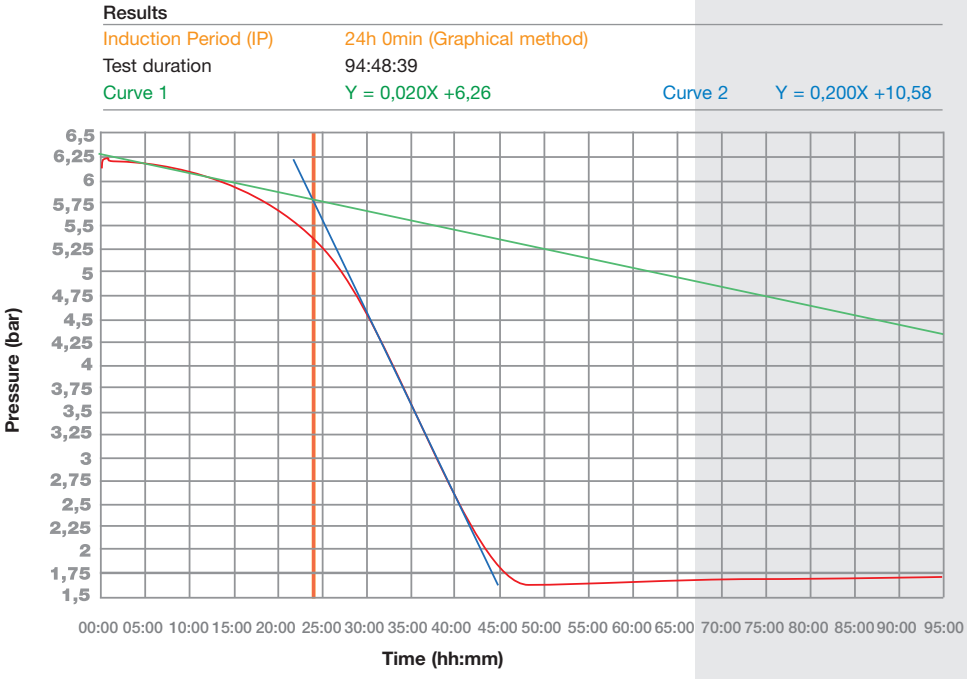
For this purpose Velp Scientifica has developed OXITEST, an innovative research instrument able to provide very valuable additional information about the fat oxidation processes in sample of foods, oils and fats.

OXITEST lets you learn the oxidative stability of the fats contained in a food (solid, pasty or liquid) within a very short time and therefore be able to forecast the food's shelf life.

Market: food and feed industry, fat and oil industries, research centres.

Fields of applications: prediction of oxidation stability during shelf life studies, rapid comparison among different product formulas or verification of different lots of the same raw material. Other analytical techniques can be associated with use of Oxitest. One of the most widely used is analysis by gas chromatography for estimating the formation of compounds due to the product's oxidation.

The induction period and the oxidation curve of the sample can be displayed graphically.



OXITEST

Technical Data

Epoxy painted steel structure studied and tested in order to give to the instrument an excellent resistance to the attack from chemical and mechanical agents and to corrosion in general

Temperature range:	from room temp. to 110°C
Pressure range:	0-8 bar
Number of Oxidation chambers:	2
Capacity single chamber:	up to 100 ml
Interface:	USB
Power:	900W
Weight:	16.5 Kg (36.3 lb)
Dimension (WxHxD):	365x190x485 mm (14.6x7.6x19.4 in)

SAFETY DEVICE

Overpressure:	safety valve
Out-range temperature:	visual alarm
Damaged probe:	visual alarm

OXITEST
Oxidation Test Reactor

By using the OXITEST instrument, it is possible to quickly estimate the oxidative stability of foods in the presence of an oxidative environment at high temperature and pressure.
In this way the oxidation process is speeded up and it can be quickly observed the food's intrinsic resistance to growing rancid and thus its oxidative stability.
The instrument has two separate oxidation chambers for performing two analyses on the same food or for analyzing different samples in the same operating conditions at the same time.
Dedicated software lets the operator follow and record the oxidative process inside the two reaction chambers and calculate the induction period.

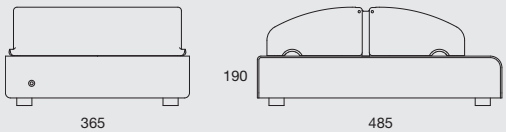
Unlike traditional systems, OXITEST allows to make the analysis directly on the complete food without having previously separated the fats it contains, with the necessary associated activities being simplified and with the analyst saving a considerable amount of time.

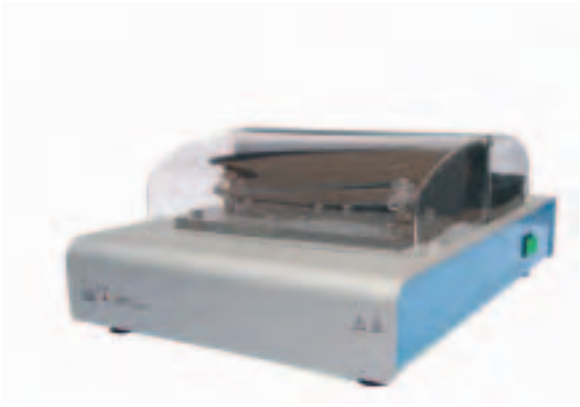
Accessories supplied with the instrument: sample holder containers and spacers made of a material highly resistant to chemical aggression that allow different types of foods to be analyzed with different quantities of product.

Instruments	Power supply	Code No
OXITEST	230 V / 50 -60 Hz	F30900248

Complete of	Code No
Oxitest software	10002948
USB cable	10003134
Sample holder	10001985
Spacer	10001984

10002948 10003134 10001985 10001984





UFV

Technical Data

Epoxy painted steel structure studied and tested in order to give to the instrument an excellent resistance to the attack from chemical and mechanical agents and to corrosion in general

Pressure range:	0 – 1,6 bar*
Packaging Volume range:	15 – 500ml
Automatic calculation of UFV	
Interface:	RS232
Power:	500W
Weight:	12 Kg (26,4 lb)
Dimension (WxHxD):	303x192x390 mm (11.9x7.6x15.3 in)

Benefits

Innovative instrument for shelf-life study of packaged food

Useful tool for the optimization of packaging

Reliable, precise and eco-compatible

*possibility to wide the range up to 0,005 bar with a external vacuum pump

UFV Measurement of unfilled volume in food packages

The term “Unfilled Volume” (UFV) generally means the unoccupied volume of the food (solid or liquid) inside a sealed package.
UFV is a very important parameter for a packaged food system, and its knowledge can be useful for both shelf life studies and designing food packages.
The Velp Scientifica UFV unit is an innovative solution able to simply and quickly measure the “unfilled volume” (or “head space”) of food packages.

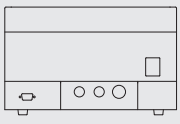
The instrument is a basic analytical solution both for the food industry for measuring the shelf life of packaged foods (estimate and forecast of the preservability and maintenance of the sanitary-nutritional quality of the product) and for the food product packaging industry for optimum design of the package (shapes, sizes, material savings).
UFV is a completely automatic instrument and is suited to a wide range of applications. It can indeed be used for any type of container, even with vacuum packaging.
UFV comes with dedicated software that guides the operator step-by-step, simply and intuitively.
The parameters measured (pressure and volume) are displayed on the PC the UFV is connected to with a serial socket-outlet in just a few minutes.
When combined with gas chromatography instruments, the UFV also measures the composition of the package’s “head space”.

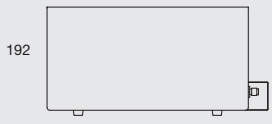
Instruments	Power supply	Code No
UFV	230 V / 50 Hz	F30920262

Complete of	Code No
UFV software	10002251
Serial cable	A00000005
Cable for external pump	10001504

10002251

A00000005





SFC 5

Technical Data

Epoxy painted steel structure studied and tested in order to give to the instrument an excellent resistance to the attack from chemical and mechanical agents and to corrosion in general

Selectable temperature:	from 0° to 60°C
Resolution:	0,1°C
Temperature stability:	± 0,1°C
Temperature Homogenity:	± 0,1°C
Admitted room temperature:	from 0° to 35°C
Temperature probe:	Pt100
Blocks number:	5
Power:	300W
Weight:	20 Kg (44 lb)
Dimension (WxHxD):	622x262x268 mm (24.5x10.3x10.6 in)

Benefits

Heating and cooling of the sample in a compact instrument

High reliability and precision of temperature

The instrument works according to the official method UNI EN ISO 8292

SFC 5 Solid Fat Content Solution for fat thermal behaviour studies

Use of the analytical Nuclear Magnetic Resonance technique for studying the thermal behaviour of fats contemplates that they be carefully prepared before the analysis is performed.
It is, in fact, necessary to thermostat the samples at different temperatures in order to prepare them for the final measurement.

Velp Scientifica developed SFC 5 for this purpose. It is an innovative instrument able to thermostat samples in the temperature range of 0 to 60°C, as required in the official sample preparation method.
SFC 5 is a compact unit that is one of a kind on the market. It cools (with 0.1°C precision) samples for the subsequent determination by Nuclear Magnetic Resonance.
The instrument is made up of 5 different blocks, each with 9 positions for housing 10 mm NMR tubes.
Each block has independent thermoregulation, with the set temperature shown on the display.
Unlike normal thermostatted water baths, this feature lets SFC 5 thermostat samples at the different temperatures required by the official method simultaneously.

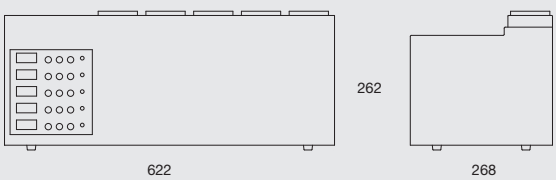
Application fields: fats manufacturers, food industry, public and private research institutions.

Main application: thermostatting fat samples in a temperature range of 0 to 60°C as preparation for Nuclear Magnetic Resonance analysis.

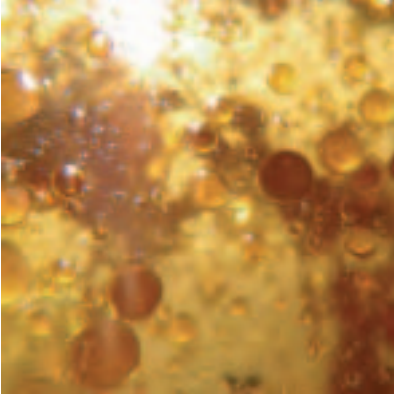
Instrument	Power supply	Code No
SFC5	230 V / 50 – 60 Hz	F31000001

Complete of	Code No
5 protection transparent cover	10002373*

* the code is referred to a single piece




VELP
SCIENTIFICA



Pumps Line

Pumps are widely used in chemical, biological and pharmaceutical laboratories because they are simple to use and owing to their varying flow rates.

Index

JPV

Technical Data

Construction material:	ABS
Max air flow rate:	22 l/min
Flow rate regulation:	0 – 22 l/min
Vacuum regulation:	1 ÷ 0.04 bar
Residual pressure with a water temperature in the tank of 15°C:	35 mm/Hg
Power:	160W
Weight:	8 Kg (17,6 lb)
Dimension (WxHxD):	250x400x370 mm (9.8x15.7x14.6 in)

Benefits

Strongly reduced water consumption
Noiseless and vibration free
Independent from tap water contingencies like with low water availability or low pressure
Water level indicator

Recirculating water vacuum pump

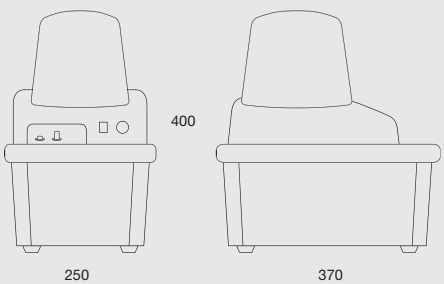
Recirculating water vacuum pump that allows to select the suction capacity. Use of common water pumps is frequently prevented by the lack of ABS adequate water mains pressure or by its high consumption.
The unit consists of an ABS structure, which is highly resistant to chemical corrosion, and a tank where the water introduced is recirculated continuously, offering considerable savings on water. The type and quality of the materials used make the instrument extremely quiet and long-lasting, and guarantee a high flow rate (up to 22 l/min). Special technical devices such as the cock for emptying the tank and two convenient handles for handling help the operator during use.

The unit is designed for all those applications where non-pulsing suction is needed; typical examples may be rotary evaporators, vacuum filtrations, (SPE), etc.

Instruments	Power supply	Code No
JPV	230 V / 50 – 60 Hz	F40100541
JPV	115 V / 50 - 60 Hz	F40110541

Optional Accessories	Code No
Vacuum tube	10001893

10001893



SP 311

Technical Data

Epoxy painted metal structure studied and tested in order to give to the instrument an excellent resistance to the attack of chemical and mechanical agents and to corrosion in general	
Electronic speed control	
Motor 24 V CC with gear reduction	
Power:	20W
Weight:	1,8 Kg (3,9 lb)
Dimension (WxHxD):	145x95x190 mm (5.7x3.7x7.5 in)

Benefits

Compact unit
Easy to use
Noiseless

Peristaltic pumps

SP311 is a single channel unit with a variable flow, able to suck up to 10 m of depth. It is provided with a tube resistant to the majority of chemical products and which is available in 2 diameters. Minimum maintenance (limited to the tube) is required and an easy cleaning is assured since liquid doesn't get in touch with mechanical parts.

The SP311 peristaltic pump is particularly recommended for:
- transfer of liquids, gases, mixtures, emulsions, etc.
- taking samples and continuous dosing;
- analysis automation.

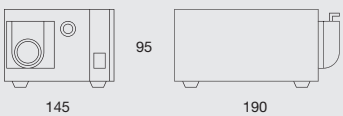
SP311 can be supplied in 4 versions with different flow rates.

Instruments	Power supply	Code No
SP 311/2	230 V / 50 – 60 Hz	F40200002
SP 311/6	230 V / 50 – 60 Hz	F40200006
SP 311/12	230 V / 50 – 60 Hz	F40200012
SP 311/60	230 V / 50 – 60 Hz	F40200060

Optional Accessories	Code No
Silicone tube Ø 4x7 mm	10002042
Silicone tube Ø 5x8 mm	10001090

Instruments	Code No	Ø Tube mm	Flow rate ml/ minute
SP 311/2	F40200002	4x7	2 - 35
SP 311/6	F40200006	4x7	6 - 135
SP 311/12	F40200012	4x7	20 - 240
SP 311/60	F40200060	5x8	125 - 1000

10002042 10001090



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