



Competence in Labware

favs
Scientific Equipment
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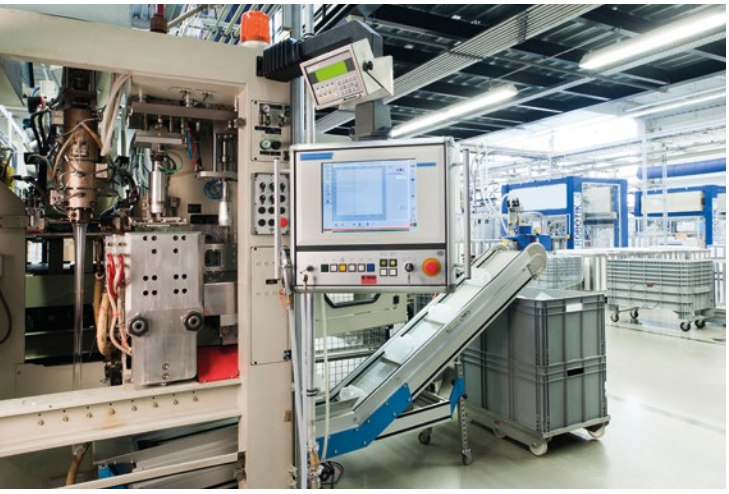
Liquid-Handling range

VITLAB®
Competence in Labware

Reliability from developme



Tradition

VITLAB has over 100 years of tradition. The company VITRI GmbH & Co. KG was established in 1908 in Mühltal, and the laboratory division was spun off in 1989 as VITLAB. Today, VITLAB is one of the leading manufacturers of liquid handling instruments and performance plastic laboratory products for one-time or long-term use. We develop and manufacture these laboratory products at our own production facility.

Certified quality

Independent inspections and routine internal audits guarantee the effectiveness of VITLAB's quality management system throughout the entire company, from development to shipment. As a result, the phrase 'Made by VITLAB' has become synonymous with quality.

Almost all our products are **made in Germany**. Supplemental procedures such as tempering and volume testing are conducted in our own facilities, which guarantees the highest possible product quality and measurement accuracy. Our continuous improvement paradigm supports our goal of 0% failure.

nt to service

The VITLAB Quality Management System has been continuously certified since January 1994, according to DIN EN ISO 9001. Active stewardship of the environment is an equally strong pillar of our business philosophy. VITLAB has been certified according to DIN EN ISO 14001 since May, 1999.

Competent customer service

Due to its intensive partnerships with distributors in over 70 countries, VITLAB can offer sound on-site advice, individual support, and quick answers to your questions. Our qualified product training sessions provide comprehensive technical and applicationoriented information on using our products. Should problems arise, our expert repair service keeps downtime as short as possible.

VITLAB products can be ordered from specialist dealers worldwide. Our authorised sales partners can be found on the internet at:

www.vitlab.com

Or contact us directly.

Your contact Customer Service

Our Customer Service staff is at your service to provide you with competent advice and answers to all your queries and questions concerning offers, orders and deliveries. Our Product Management and Sales Team are at your disposal – also "on site" – with any technical information or assistance that you might require for your application.

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For your Information

Please understand that technical specifications, catalogue numbers and designs may change after this catalogue is published. The illustrations used are for representation only, and the details may vary from the description. All measurements, with the exception of exact tolerances, should be understood as approximate values. Please keep in mind that the actual testing and measuring results can be influenced by a variety of factors that are beyond our control. Therefore, you should carefully check the transferability of the data applying it to a particular application.

The packaging units (PU) correspond to the minimum order quantities. All up-to-date information is also available on the internet at www.vitlab.com.

Table of contents

Clear product statements

Our aim is to provide you with a clear and comprehensive presentation of all relevant product information. For quick reference, we use the following symbols:

DE-M marking for conformity certified products according to the German Measurement and Calibration Regulation (legally replaces since January 1, 2015)

Food-safe products according to EU Directive No. 10/2011

Products that can be autoclaved at 121 °C (2 bar) according to DIN EN 285. Note restrictions!

CE mark according to EU Guideline 2011/65/EC:2011/06, 2014/30/EC:2014/02, 2014/35/EC:2014/02

CE-IVD mark according to EU Guideline 98/79/EC

Ultimate liquid handling precision

Simple and safe

Liquid handling represents a large portion of routine laboratory work. The devices you use must allow you to carry out your work easily and safely and, above all, to provide the precision you expect. VITLAB specializes in devices for titration and precise volumetric dispensing for a wide range of applications. But we do not ignore your convenience: VITLAB's liquid handling devices are easy to take apart, thanks to their modular construction, and are very simple to clean. This ensures long-time use and minimal downtime.

Certified quality

For all volumetric instruments that are subject to test equipment monitoring, a written documentation about the regularly calibration resp. volume control is neccessary. The documentation should contain the values for accuracy and coefficient of variation as well as the testing procedure and test frequency.

A distinction is made between:

- Quality certificates (factory calibration report)
- Official calibration certificate (DAkkS, Bureau of standards)

The VITLAB quality certificate is a factory calibration report on the basis of the quality assurance system according to DIN EN ISO 9001. The certificate is included in every packaging and documents for each liquid handling device:

- Type of device
- Serial number
- Accuracy (A %)
- Coefficient of variation (CV %)

This product data is stored at VITLAB and may be accessed by request. This assures long time traceability of test results for VITLAB instruments. Quality certificates are available as batch or individual certificate. To order a new VITLAB instrument with an individual factory calibration, please add „EZ/…" as a prefix to the corresponding catalogue number.

A plus of safety for your analyses

Guaranteed accuracy with DAkkS calibrated instruments

The DAkkS calibration certificate documents officially the traceability of measuring results to national and international standards as required by the standards DIN EN ISO 9001 and DIN EN ISO / IEC 17025 for the monitoring of measuring instruments.

A major difference between factory calibration services and DAkkS laboratories is the accurate determination of the respective uncertainty of measurement guaranteed by the accredited laboratory and supervised by the DAkkS. DAkkS calibration certificates are appropriate in uses in which calibrations of an accredited laboratory are requested, where high level calibrations are demanded and for calibration of reference standards and instruments for comparative measurements.

To order a new VITLAB instrument with DAkkS calibration, please add „DAkkS/...“ as a prefix to the corresponding catalogue number.

VITLAB provides calibration service to minimise your testing effort

A volume testing for your liquid handling instruments is recommended every 3 - 12 month. This interval should be adjusted, for example when working very frequently or when using aggressive media.

To minimise the testing effort of the regular examinations required by the DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO / IEC17025 and the GLP guidelines, VITLAB provides an optimised calibration service for your liquid handling instruments acc. to ISO 8655.

Just send in the instruments to be calibrated, accompanied by an indication which kind of calibration you wish. Your instruments will be returned within a few days together with a test report (VITLAB factory calibration service) or with a DAkkS calibration certificate.

Perfection in Liquid Handling

RAPID AND ACCURATE TITRATION

VITLAB®
Competence in Labware


1

2


3


4

VITLAB® continuous E/RS

DE-M CE

The VITLAB® continuous bottle-top burette (Figure 1) enables continuous titration, which leads to rapid, convenient, and accurate results. The angled display shows 4-position titration volume in large, easily read numbers (Figure 2), which simplifies operation. Turning the two hand wheels supplies the titration medium in a **continuous and pulse-free** manner via the specially developed double-piston pump (Figure 3). Filling procedures are not necessary. This innovative technology increases safety; its compact design and low centre of gravity reduce risk of overturning, especially with smaller bottles. The height and length of the discharge tube can be adjusted, making it possible to work safely with both short and tall bottles. The innovative recirculation system (Figure 4) **prevents the loss of valuable reagent** and reduces the risk of splashes. With its simple-to-use calibration function, VITLAB® continuous fulfils the corresponding requirements for test equipment monitoring without instrument downtime. Margins of error are under those specified in the DIN EN ISO 8655-3 standard, even for partial volumes. VITLAB® continuous is DE-M marked. Also available with DAkkS calibration certificate.

Included in delivery:
VITLAB® continuous E/RS, with GL 45 connecting threads and GL 32, GL 38 and S 40 (buttress thread) size PP thread adapters, telescopic filling tube (200 - 350 mm), telescopic discharge tube (140 - 220 mm), two 1.5 V microbatteries (LR 03/AAA), instruction manual, and quality certificate.

Type	Volume/rot.** ml	A* ≤ ± %	CV* ≤ %	PU	Cat. No.
E	2.5	0.2 at 25 ml	0.1 at 25 ml	1	1620506
RS	5.0	0.2 at 50 ml	0.1 at 50 ml	1	1620507

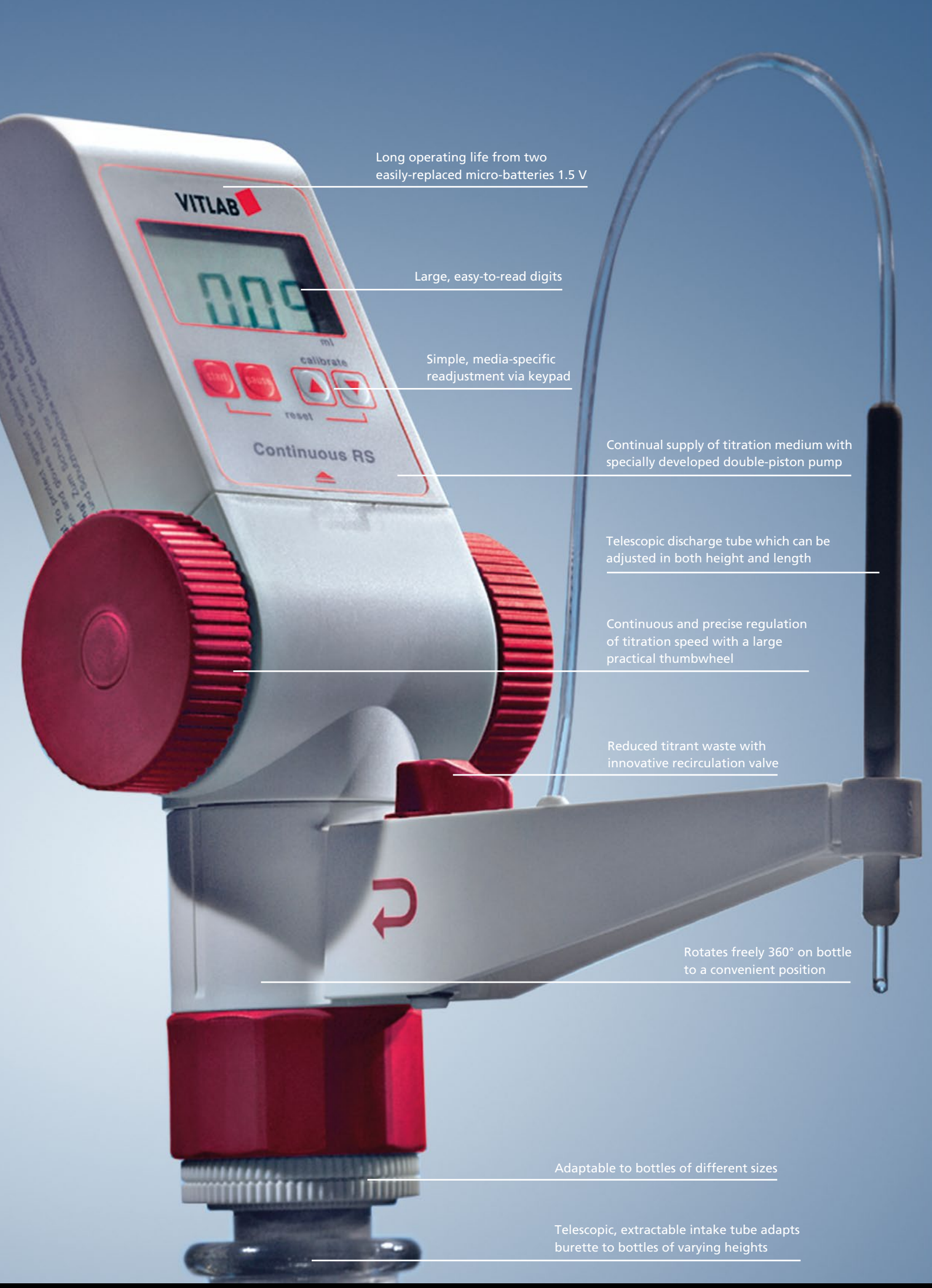
*Accuracy and coefficient of variation according to DIN EN ISO 8655-3

**Volume dispensed per rotation of the hand wheel

The VITLAB® continuous E/RS bottle-top burette can be used for the following titrants up to a concentration of 1 mol/L:

Acetic acid	Potassium dichromate solution
Ammonium iron (II) sulphate solution	Potassium hydroxide
Ammonium thiocyanate solution	Potassium iodate solution
Barium chloride solution	Potassium permanganate solution
Bromide bromate solution	Potassium thiocyanate solution
Cerium (IV) sulphate solution	Silver nitrate solution
EDTA solution	Sodium arsenite solution
Hydrochloric acid	Sodium carbonate solution
Iodine solution	Sodium chloride solution
Iron (II) sulphate solution	Sodium hydroxide
Nitric acid	Sodium nitrite solution
Oxalic acid solution	Sodium thiosulphate solution
Perchloric acid	Sulphuric acid
Potassium bromate solution	Tetra-n-butylammonium hydroxide solution
Potassium bromide / bromate solution	Zinc sulphate solution

The recommendations in this table have been carefully tested and reflect the most current information available. Always follow the instruction manual for the instrument as well as the reagent manufacturer's specifications. Should you require information on chemicals not listed, please do not hesitate to contact us. As at 03/12.



Long operating life from two easily-replaced micro-batteries 1.5 V

Large, easy-to-read digits

Simple, media-specific readjustment via keypad

Continual supply of titration medium with specially developed double-piston pump

Telescopic discharge tube which can be adjusted in both height and length

Continuous and precise regulation of titration speed with a large practical thumbwheel

Reduced titrant waste with innovative recirculation valve

Rotates freely 360° on bottle to a convenient position

Adaptable to bottles of different sizes

Telescopic, extractable intake tube adapts burette to bottles of varying heights

Adapter for VITLAB® continuous E/RS

For secure screwing of the burettes onto reagent bottles with an NS neck, GL screw threading or an S buttress thread.

Description	External thread	Bottle neck threads	PU	Cat. No.
NS-adapter, PP	GL 32	NS 19/26	1	1670066
NS-adapter, PP	GL 32	NS 24/29	1	1670067
NS-adapter, PP	GL 32	NS 29/32	1	1670068
Thread adapter, PP	GL 32	GL 28	1	1670155
Thread adapter, PP	GL 38	GL 32	1	1670085
Thread adapter, PP	GL 45	GL 32	1	1670180
Thread adapter, PP	GL 45	GL 38	1	1670110
Thread adapter, PP	GL 45	S 40	1	1670120
Thread adapter, ETFE	GL 32	GL 28	1	1670080
Thread adapter, PTFE	GL 38	GL 32	1	1670095
Thread adapter, ETFE	GL 45	GL 32	1	1670100
Thread adapter, ETFE	GL 45	GL 38	1	1670115
Thread adapter, PTFE	GL 45	S 40	1	1670125

Drying tube for VITLAB® continuous E/RS

PP, transparent, unfilled. Can be connected directly to the burette.

Description	PU	Cat. No.
Drying tube, PP, unfilled	1	1671095

Telescopic filling tube for VITLAB® continuous E/RS

For the filling of titration medium from bottles of different heights.

Description	Length mm	PU	Cat. No.
Telescopic filling tube, FEP, ETFE, PTFE	200 - 350	1	1671085

Threaded bottles for VITLAB® continuous E/RS

Threaded brown glass (soda lime glass) bottles with an ethylene acrylate coating.

Volume ml	Thread GL	Shape	PU	Cat. No.
1000	45	square	1	1671500
2500	45	round	1	1671510

Perfection in Liquid Handling

HIGHEST RELIABILITY IN DISPENSING

VITLAB®
Competence in Labware

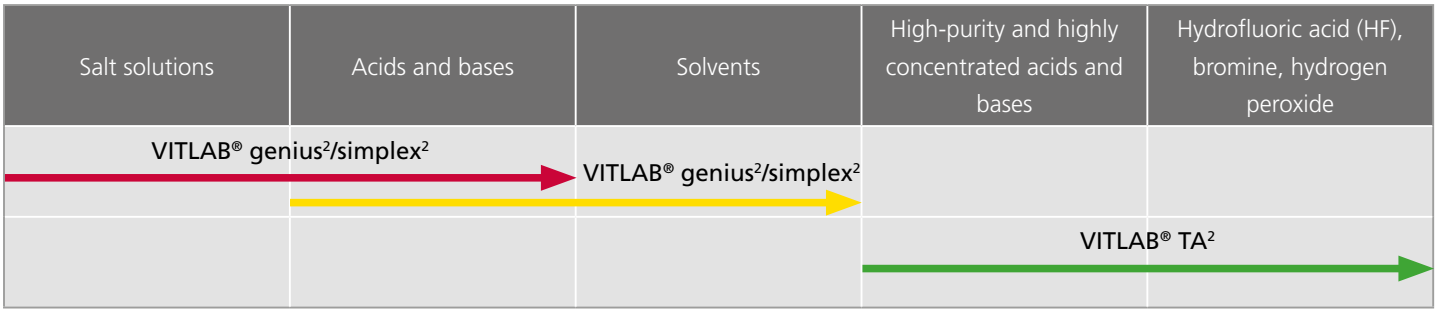
VITLAB® Dispenser line: genius², simplex², and TA²

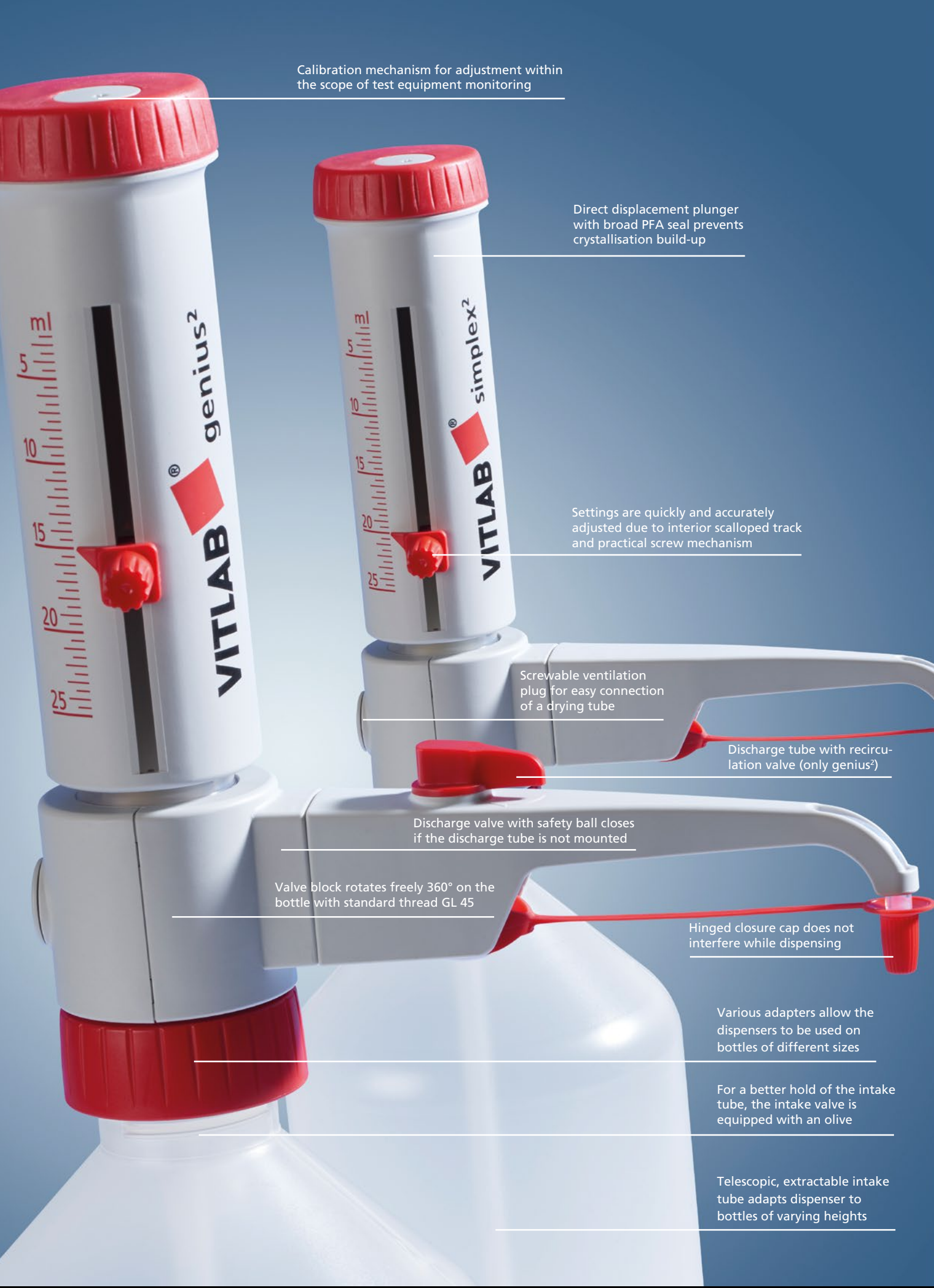
VITLAB® genius² and simplex² bottle-top dispensers are a family of instruments with proven precision that offer many advantages in routine liquid-handling operations. VITLAB® genius² and simplex² instruments can be used for practically any task and are suitable for organic and inorganic solutions, while VITLAB® TA² dispensers have been specially developed for use in trace analysis and with highly concentrated media. As they are produced from materials with extremely high chemical resistance (e.g. PTFE, PFA, FEP, borosilicate glass and platinum-iridium), VITLAB® bottle-top dispensers are very robust and reliable and resistant against most acids, bases and organic solvents.

	VITLAB® genius² / simplex² / simplex²$_{fix}$	VITLAB® TA²
Applications	Salt solutions, acids, bases, and many organic solvents	Specially for use in trace analysis for dispensing high-purity and highly concentrated acids and alkalis, as well as hydrogen peroxide, bromine and HF
Components in contact with media	Borosilicate glass, Al_2O_3-ceramic, FEP, ETFE, PFA, PTFE, platinum-iridium, PP (screw cap)	Various fluoroplastics (e.g., ETFE, FEP, PFA, PCTFE, PTFE), Al_2O_3-sapphire, platinum-iridium or tantalum (depending on the model)
Operating limits	Temperature: +15 °C to +40 °C Steam pressure: max. 600 mbar Viscosity: max. 500 mm²/s Density: max. 2.2 g/cm³	Temperature: +15 °C to +40 °C Steam pressure: max. 600 mbar Viscosity: max. 500 mm²/s Density: max. 3.8 g/cm³

* Dynamic viscosity [mPas] = kinematic viscosity [mm²/s] x density [g/cm³]

General guide for dispenser selection (for the classification of dispenser media, see page 18).




Calibration mechanism for adjustment within the scope of test equipment monitoring
Direct displacement plunger with broad PFA seal prevents crystallisation build-up
Settings are quickly and accurately adjusted due to interior scalloped track and practical screw mechanism
Screwable ventilation plug for easy connection of a drying tube
Discharge tube with recirculation valve (only genius²)
Discharge valve with safety ball closes if the discharge tube is not mounted
Valve block rotates freely 360° on the bottle with standard thread GL 45
Hinged closure cap does not interfere while dispensing
Various adapters allow the dispensers to be used on bottles of different sizes
For a better hold of the intake tube, the intake valve is equipped with an olive
Telescopic, extractable intake tube adapts dispenser to bottles of varying heights
VITLAB genius²
VITLAB simplex²
ml
5
10
15
20
25

Dosing with precision and comfort

Drawing quantities of liquids from large supply bottles is a daily routine in the lab. This manual task must be carried out quickly, accurately, reproducibly, simply and safely.

The bottle-top dispensers VITLAB® genius² and simplex² are equipped with a positive displacement piston and a fluoroplastic (PFA) sealing lip on the cylinder wall. The latter acts as a "windscreen wiper" to prevent crystal build-up on the cylinder wall from readily crystallisable media. The telescopic filling tube can be adjusted smoothly to different bottle heights.

VITLAB® genius² and simplex² can both be calibrated within the scope of test equipment monitoring according ISO 9001 and GLP guidelines (a change to the factory settings is indicated), and are autoclavable according to DIN EN 285 at 121 °C (2 bar) and DE-M marked.

NEW!

Improved volume adjustment for variable Dispensers VITLAB® genius² and simplex². Due to an interior scalloped track, changing the volume setting is now even faster. The volume selector locks in place and the volume is securely fixed.

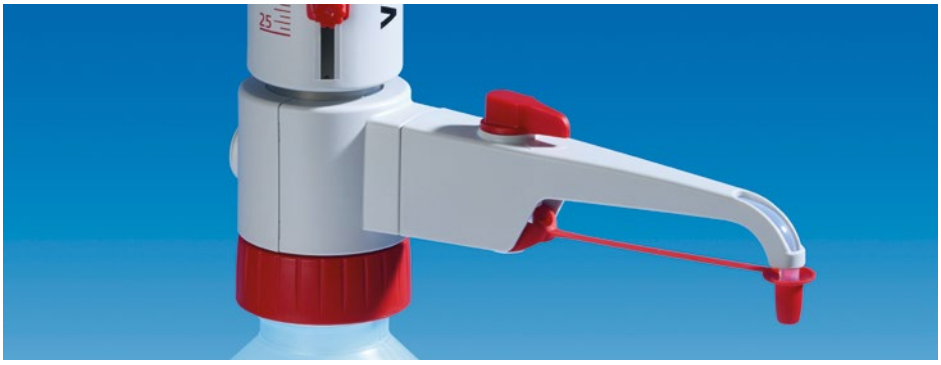
NEW!

Also new is the screwable discharge valve that is equipped with an additional safety ball. If the discharge tube is not mounted, the safety ball closes the dispensing channel.

NEW!

The standard threading for every dispenser is GL 45. The dispensers can be screwed directly or with the help of the supplied adapters on all common lab bottles.

Bottle-top dispensers



NEW!

New is the discharge tube, which is available with (genius²) or without (simplex²) recirculation valve and can be easily exchanged, if required.

NEW!

The hinged closure cap is positioned in a way that it can swing completely out of the work area.

NEW!

Starting immediately, the ventilation plug is screwable. Therefore, a drying tube can be even more easily connected.

An extensive range of accessories allows the operator to use the dispensers for a variety of special applications.

- Serial Dispensing:

  The flexible discharge tube facilitates the dosing of longer series. It can be used to fill narrow reaction vessels quickly and precisely.

- Dispensing sterile media:

  The dispensers VITLAB® simplex² and genius² are completely autoclavable at 121 °C. A microfilter can be connected in order to filter the indrawn air flow.

- Dispensing of sensitive media:

  The drying tube can protect sensitive media against humidity and CO_2.

Recommended usage ranges for VITLAB® genius² and VITLAB® simplex²:

	Medium		Medium		Medium
O	Acetaldehyde	O	Cresol	O	Methyl ethyl ketone
O	Acetic acid, ≤ 96%	O	Cumene (Isopropylbenzene)	O	Methyl formate
O	Acetone	O	Cyclohexanone	O	Methyl propyl ketone
O	Acetonitrile	O	Decane	O	Mineral oil (Motor oil)
O	Acetylacetone	O	1-Decanol	O	Monochloroacetic acid, ≤ 50%
O	Acrylic acid	O	Diethylene glycol	I	Nitric acid, ≤ 60%*/**
O	Acrylonitrile	O	Dibenzyl ether	O	Nitrobenzene
O	Adipic acid	O	Dichlorobenzene	O	Octane
O	Allyl alcohol	O	Dichloroethane	O	Oleic acid
I	Aluminium chloride	O	Diethanolamine	O	Oxalic acid
O	Amino acid	O	Diethyl ether	I	Perchloric acid
I	Ammonium chloride	O	Diethylamine	O	Petroleum
I	Ammonium fluoride	O	1,2 Diethylbenzene	O	Phenol
I	Ammonium hydroxide, ≤ 20%	O	Dimethyl sulphoxide (DMSO)	O	Phenylethanol
I	Ammonium sulphate	O	Dimethylaniline	O	Phenylhydrazine
O	Amyl acetate	O	Dimethylformamide (DMF)	I	Phosphoric acid, ≤ 85%
O	Amyl alcohol (Pentanol)	O	1,4 Dioxane	I	Phosphoric acid, 85% + sulphuric acid, 98%,1:1
O	Amyl chloride (Chloropentane)	O	Diphenyl ether	O	Piperidine
O	Aniline	O	Ethanol	I	Potassium chloride
I	Barium chloride	O	Ethanolamine	I	Potassium dichromate
O	Benzaldehyde	O	Ethyl acetate	I	Potassium hydroxide
O	Benzene	O	Formaldehyde, ≤ 40%	I	Potassium permanganate
O	Benzoyl chloride	O	Formamide	O	Propanol
O	Benzyl alcohol	O	Formic acid	O	Propionic acid
O	Benzyl chloride	O	Gasoline	O	Propylene glycol (Propanediol)
O	Benzylamine	O	Glacial acetic acid	O	Propylene oxide
I	Boric acid, ≤ 10%	O	Glycerine	O	Pyridine
O	Bromobenzene	O	Glycol (Ethylene glycol)	O	Pyruvic acid
O	Bromonaphthalene	O	Glycolic acid, 50%	O	Salicylaldehyde
O	Butanediol	O	Heating oil (Diesel oil)	O	Salicylic acid
O	1-Butanol	O	Hexane	O	Silver acetate
O	n-Butyl acetate	O	Hexanoic acid	I	Silver nitrate
O	Butyl methyl ether	O	Hexanol	O	Sodium acetate
O	Butylamine	I	Hydrochloric acid, ≤ 37%**	I	Sodium chloride
O	Butyric acid	I	Hydroiodic acid, ≤ 57%**	I	Sodium dichromate
I	Calcium carbonate	I	Iodine / potassium iodide solution	I	Sodium fluoride
I	Calcium chloride	O	Isoamyl alcohol	I	Sodium hydroxide, ≤ 30%
I	Calcium hydroxide	O	Isobutanol	I	Sodium hypochlorite
I	Calcium hypochlorite	O	Isopropanol (2-propanol)	I	Sulphuric acid, ≤ 98%
O	Chloroacetaldehyde, ≤ 45%	O	Isopropyl ether	O	Tartaric acid
O	Chloroacetic acid	O	Lactic acid	O	Tetramethylammonium hydroxide
O	Chloroacetone	I	Magnesium chloride	O	Toluene
O	Chlorobenzene	I	Mercury chloride	O	Turpentine
O	Chlorobutane	O	Methanol	O	Urea
O	Chloronaphthalene	O	Methoxybenzene	O	Xylene
I	Chromic acid, ≤ 50%	O	Methyl benzoate	I	Zinc chloride, ≤ 10%
I	Chromic-sulphuric acid	O	Methyl butyl ether	I	Zinc sulphate, ≤ 10%
I	Copper sulphate				

The above data have been carefully checked and reflect the current state of knowledge. Always follow the instructions for use that accompany the instrument as well as the reagent manufacturer's instruction manual. In addition to the chemicals listed above, solutions of a wide variety of organic or inorganic salts (e.g., biological buffers), biological detergents, and cell culture media can be dispensed. Should you require information on chemicals not listed, please do not hesitate to contact us. Last updated: 10/15.

* Use ETFE/PTFE bottle adapter

** Use drying tube

I	Inorganic media
O	Organic media

Bottle-top dispensers

VITLAB® genius²

Bottle-top dispenser with variable volume and recirculation system. DE-M marked.

Included in delivery: VITLAB® genius², 3 respectively 5 threaded adapters* made of PP, telescopic filling tube, recirculation tube, mounting tool, instruction manual, quality certificate.

Volume ml	Graduation ml	A** ≤ ± %	A** ≤ ± µl	CV** ≤ %	CV** ≤ µl	PU	Cat. No.
0.2 - 2.0	0.05	0.5	10	0.1	2	1	1625503
0.5 - 5.0	0.10	0.5	25	0.1	5	1	1625504
1.0 - 10.0	0.20	0.5	50	0.1	10	1	1625505
2.5 - 25.0	0.50	0.5	125	0.1	25	1	1625506
5.0 - 50.0	1.00	0.5	250	0.1	50	1	1625507
10.0 - 100.0	1.00	0.5	500	0.1	100	1	1625508

VITLAB® simplex²

Bottle-top dispenser with variable volume. DE-M marked.

Included in delivery: VITLAB® simplex², 3 respectively 5 threaded adapters* made of PP, telescopic filling tube, mounting tool, instruction manual, quality certificate.

Volume ml	Graduation ml	A** ≤ ± %	A** ≤ ± µl	CV** ≤ %	CV** ≤ µl	PU	Cat. No.
0.2 - 2.0	0.05	0.5	10	0.1	2	1	1621503
0.5 - 5.0	0.10	0.5	25	0.1	5	1	1621504
1.0 - 10.0	0.20	0.5	50	0.1	10	1	1621505
2.5 - 25.0	0.50	0.5	125	0.1	25	1	1621506
5.0 - 50.0	1.00	0.5	250	0.1	50	1	1621507
10.0 - 100.0	1.00	0.5	500	0.1	100	1	1621508

VITLAB® simplex²$_{fix}$

Bottle-top dispenser with fixed volume. DE-M marked.

Included in delivery: VITLAB® simplex²$_{fix}$, 5 threaded adapters* made of PP, telescopic filling tube, mounting tool, instruction manual, quality certificate.

Volume ml	Graduation ml	A** ≤ ± %	A** ≤ ± µl	CV** ≤ %	CV** ≤ µl	PU	Cat. No.
1.0	-	1.0	10	0.2	2	1	1622502
5.0	-	0.5	25	0.1	5	1	1622504
10.0	-	0.5	50	0.1	10	1	1622505

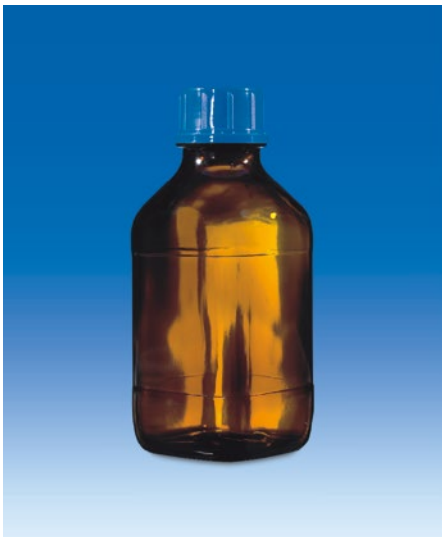
* Nominal volume 1 - 10 ml: with adapters GL 25, GL 28, GL 32, GL 38, S 40 and telescopic intake tube (length 125 - 240 mm).
Nominal vollume 25 - 100 ml: with adapters GL 32, GL 38, S 40 and telescopic intake tube (length 170 - 330 mm).

** Accuracy and Coefficient of variation according to DIN EN ISO 8655-5

Bottles for VITLAB® genius² and simplex²

Reagent bottles made of Polypropylene. Transparent.
With screw cap made of PP.
Good chemical resistance, ideal for long-term storage of liquids.
Autoclavable at 121 °C (2 bar) according to DIN EN 285.
Food-safe products according to EU directive No. 10/2011.

Volume ml	Thread GL	Height mm	Ø mm	PU	Cat. No.
500	25	165	87	10	100589
500	45	172	87	10	101789
1000	32	202	108	10	100689
1000	45	197	105	10	102089
2000	32	245	131	6	100789
2000	45	241	131	6	102189



Threaded brown glass (soda lime glass) bottles with an ethylene acrylate coating for increased safety, and a screw cap. The plastic coating significantly reduces hazardous glass splintering during breakage. The maximum working temperature for coated bottles is 80 °C. To preserve the coating, do not clean at temperatures exceeding 60 °C.

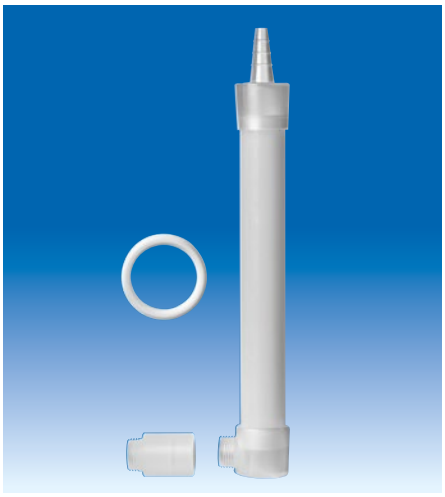
Volume	Form	Bottle neck threads GL	PU	Cat. No.
100	round	GL 28	1	1671505
100	square	GL 32	1	1671506
250	square	GL 32	1	1671515
500	square	GL 32	1	1671520
1000	square	GL 45	1	1671500
2500	round	GL 45	1	1671510

Plastic stand for VITLAB® dispensers

For secure anchoring, made entirely of polypropylene for contamination-free operation (no metal).
Suitable for VITLAB® dispensers with screw coupling GL 45.
Stand rod: 300 mm; base: 220 x 160 mm; weight: 1,130 g.

Description	PU	Cat. No.
Plastic stand	1	1671116

Drying tube for VITLAB® genius² and simplex²



PP, transparent, unfilled, with sealing ring (PTFE).
Can directly be connected to every dispenser.

Description	PU	Cat. No.
Drying tube, PP, unfilled	1	1671090

Flexible discharge tube for VITLAB® genius² and simplex²

Coiled, made of FEP, approx. 80 cm length, with handle and recirculation valve made of PTFE. Includes handle and assembly instructions.

Description	PU	Cat. No.
Flexible discharge tube for simplex² / genius² 2, 5 and 10 ml	1	1678132
Flexible discharge tube for simplex² / genius² 25, 50 and 100 ml	1	1678134

Adapter for VITLAB® genius² and simplex²

For securely screwing the dispenser onto the reagent bottles with an NS neck, GL screw threading or an S buttress thread.

Description	External thread	Bottle neck threads	PU	Cat. No.
NS-adapter, PP	GL 32	NS 19/26	1	1670066
NS-adapter, PP	GL 32	NS 24/29	1	1670067
NS-adapter, PP	GL 32	NS 29/32	1	1670068
Thread adapter, PP	GL 32	GL 25	1	1670150
Thread adapter, PP	GL 32	GL 28	1	1670155
Thread adapter, PP	GL 32	GL 38	1	1670165
Thread adapter, PP	GL 32	GL 45	1	1670175
Thread adapter, PP	GL 32	S 40	1	1670170
Thread adapter, PP	GL 45	GL 32	1	1670180
Thread adapter, PP	GL 45	GL 38	1	1670110
Thread adapter, PP	GL 45	S 40	1	1670120

Telescopic filling tube for VITLAB® genius² and simplex²

Telescopic filling tube made of FEP, ETFE and PTFE.

Suitable for dispenser with nominal volume	Outer-Ø mm	Length mm	PU	Cat. No.
2/5/10 ml	6.0	70-140	1	1678210
2/5/10 ml	6.0	125-240	1	1678212
2/5/10 ml	6.0	195-350	1	1678214
2/5/10 ml	6.0	250-480	1	1678216
25/50/100 ml	7.6	170-330	1	1678218
25/50/100 ml	7.6	250-480	1	1678220

Sealing ring for the valve block for VITLAB® genius² and simplex²

Sealing ring for valve block made of PTFE for dosing highly volatile media.

Description	PU	Cat. No.
Sealing ring for valve block	1	1671683

Ventilation plug for micro filter for VITLAB® genius² and simplex²

PP, with Luer-cone and sealing ring (PTFE).

Description	PU	Cat. No.
Ventilation plug for micro filter	1	1671682

VITLAB® TA²

The VITLAB® TA² dispenser is the dosing device of choice to meet the demanding purity standards required in trace analysis. The high quality parts that come exclusively in contact with the medium and the specially developed and proven cleaning process to be done before use results in **a reduced release of trace metal ions to the low ppb range, or, depending on the application, even the ppt range**. The parts that are in contact with media are made of various fluoroplastics (e.g. ETFE, FEP, PFA, PTFE, PCTFE), Al_2O_3-sapphire, platinum-iridium or tantalum (depending on model).

Thanks to the excellent chemical resistance of the materials used, the new dispenser can also be deployed with **highly concentrated acids and bases**, such as perchloric, sulphuric and nitric acid. Depending on the application, there is a choice of two different valve spring systems: the VITLAB® TA² with tantalum spring is recommended for dosing of hydrogen peroxide (H_2O_2). For applications using sodium hydroxide (up to a max. concentration of 30%) or hydrogen fluoride (HF) the platinum-iridium spring is recommended. In order to minimize the loss of valuable reagents or sample solutions, VITLAB offers the dispenser with the optional recirculation valve. Also available with DAkkS calibration certificate.

Included in delivery:
VITLAB® TA² dispenser (screw thread GL 45) with adjustable variable volumes, DE-M marked, with quality certificate, telescopic filling tube, mounting tool, GL 28/S 28 (ETFE), GL 32 (ETFE), and S 40 (PTFE) bottle adapters, and instruction manual. Optionally with or without recirculation valve.

Volume ml	Valve spring	Recirculation	Graduation ml	A* ≤ ± %	CV* ≤ %	PU	Cat. No.
1.0 - 10.0	Pt-Ir	no	0.2	0.5	0.1	1	1627515
1.0 - 10.0	Pt-Ir	yes	0.2	0.5	0.1	1	1627525
1.0 - 10.0	Ta	no	0.2	0.5	0.1	1	1627535
1.0 - 10.0	Ta	yes	0.2	0.5	0.1	1	1627545

Error tolerance conforming to DIN EN ISO 8655-5, related to the nominal (maximum) volume marked on the device where the device, environment and distilled H_2O are at the same temperature (20 °C). Checks are done in accordance with DIN EN ISO 8655-6 with the device filled to capacity and with uniform and jolt-free dosing. Certified as conforming to DIN 12 600.

Recommended dispensing media for VITLAB® TA²

Dispensing medium	Valve spring: Pt-Ir	Valve spring: Ta
Acetic acid	+	+
Ammonia solution	+	+
Bromine	+	+
Hydrochloric acid	+	+
Hydrofluoric acid*)	+	-
Hydrogen peroxide	-	+
Nitric acid	+	+
Perchloric acid	+	+
Phosphoric acid	+	+
Sodium hydroxide, 30%	+	-
Sulphuric acid	+	+
Water	+	+

+ suitable / - unsuitable

*) Note: Hydrofluoric acid reacts slightly with sapphire resulting in slightly increased aluminium levels. To reduce these values we recommend discarding 3-5 dosings of 2 ml each before performing analysis.


Calibration mechanism for adjustment within the scope of test equipment monitoring
Fast, precise volume setting with practical screw mechanism
Easy handling using positive displacement plunger with PFA seal to prevent crystallisation
Easy detachment and replacement of dosing unit due to modular design
No loss of medium due to recirculation valve (optional)
Rotates freely 360° on bottle to align the label of the bottle with the touch panel
Extremely low release of trace metal content (in the ppb – ppt range) through use of high-purity contact parts
No dripping through use of discharge tube
Usable with a variety of bottle sizes using different adapters
Suitable for a variety of bottle heights using extendable telescopic intake tube
VITLAB
TA²
trace analysis
1 ml
2
3
4
5
6
7
8
9
10

Bottle-top dispensers

Wide-mouth bottles, PFA

Transparent.
With screw cap made of PFA with buttress threads. Ideal for long-term storage of high-purity oxidants, acids, alkalis, as well as hydrocarbons, trace analysis solvents and standards.

Volume ml	Thread	Height mm	Ø mm	PU	Cat. No.
500	S 40	179	76	1	109597
1000	S 40	217	96	1	109697
2000	S 40	245	130	1	109797

Dispensing cartridge for VITLAB® TA²

Calibrated, including safety ring, with quality certificate. Nominal volume 10 ml.

Description	PU	Cat. No.
Dispensing cartridge	1	1670702

Plastic stand for VITLAB® TA²

For secure anchoring, made entirely of polypropylene for contamination-free operation (no metal). Stand rod: 300 mm; base: 220 x 160 mm; weight: 1,130 g.

Description	PU	Cat. No.
Plastic stand	1	1671116

Telescopic filling tube for VITLAB® TA²

Individually adjustable lengths.

Description	Length mm	PU	Cat. No.
Telescopic filling tube, FEP, PTFE	70 – 140	1	1678210
Telescopic filling tube, FEP, PTFE	125 – 240	1	1678212
Telescopic filling tube, FEP, PTFE	195 – 350	1	1678214
Telescopic filling tube, FEP, PTFE	250 – 480	1	1678216

Adapter for VITLAB® TA²

For securely screwing the dispenser onto reagent bottles with GL screw threading or an S buttress thread.

Description	External thread	Bottle neck threads	PU	Cat. No.
Thread adapter, ETFE	GL 32	GL 25	1	1670072
Thread adapter, ETFE	GL 32	GL 28	1	1670080
Thread adapter, ETFE	GL 32	GL 45	1	1670105
Thread adapter, ETFE	GL 45	GL 32	1	1670100
Thread adapter, ETFE	GL 45	GL 38	1	1670115
Thread adapter, PTFE	GL 45	S 40	1	1670125

Flexible discharge tube for VITLAB® TA²

Coiled, made of FEP, length approx. 80 cm, including collection tube and assembly instructions.
Not suitable for hydrofluoric acid (HF)!

Description	PU	Cat. No.
Flexible discharge tube for VITLAB® TA²	1	1678136

VITLAB® piccolo

For dispensing tiny quantities of liquids in all areas of biochemical and medical research.

Even the **smallest quantities can be dispensed directly from the bottle** with the VITLAB® piccolo - a big help, particularly for serial dispensing operations. Special advantage: Disposable tips are unnecessary. This reduces costs.
The ergonomic design makes dispensing effortless and stress-free. The VITLAB® piccolo **can be operated with only one hand**. Use the thumb to depress the volume dispensing button, just as with a pipette, and a reset mechanism refills the volume automatically.
The discharge tube can be rotated over 360° so that it is always optimally situated with respect to the bottle label.
The VITLAB® bottletop dispensers piccolo 1 and piccolo 2 are used mainly in connection with aqueous and highly diluted agents. Only high-quality materials, such as PTFE, PFA, ETFE, FEP, borosilicate glass, and platinum-iridium come in contact with the media.

VITLAB® piccolo 1 with a fixed volume
VITLAB® piccolo 2 with two fixed volumes

Included in delivery:
VITLAB® piccolo 1 or 2 with GL 28 connecting threads, mounting tool, and instruction manual.

Type	Volume µl	A* ≤ ± %	CV* ≤ %	PU	Cat. No.
piccolo 1	100	3.0	0.4	1	1610501
piccolo 1	200	2.5	0.4	1	1610502
piccolo 1	250	2.0	0.4	1	1610503
piccolo 1	500	1.5	0.3	1	1610504
piccolo 1	1000	1.0	0.2	1	1610506
piccolo 2	100 / 250	2.0	0.4	1	1611503
piccolo 2	500 / 1000	1.0	0.2	1	1611506
piccolo 2	1000 / 2000	1.0	0.2	1	1611508

* Accuracy and coefficient of variation according to DIN EN ISO 8655-5
Other volumes available upon request.

Adapter for VITLAB® piccolo

For securely screwing the dispenser onto reagent bottles with GL screw threading.

Description	External thread	Bottle neck threads	PU	Cat. No.
Thread adapter, PP	GL 28	GL 32	1	1670145

Bottles for VITLAB® piccolo, PE-HD

Transparent. With screw cap made of PP. Space-saving due to the square cross-section and the high shoulders.

Volume ml	Thread	Height mm	Dimension mm	PU	Cat. No.
100	GL 32	78	46 X 46	24	92489
250	GL 28	80	80 X 80	24	91989
500	GL 32	106	90 X 90	12	92089
1000	GL 32	187	80 X 80	12	92189

Perfection in Liquid Handling

PRECISE AND CONVENIENT PIPETTING

VITLAB®
Competence in Labware

Efficiency in variable pipetting

Handling of air-interface pipettes

Aspirate sample

- Adjust volume
- Use the correct tip(s) according to the volume range (Color-Code)
- Press the pipetting button to the first stop and keep the button pressed
- Immerse the pipette tip(s) 2 to 6 mm into the liquid (depending on volume)
- Let the pipetting button slide back slowly while holding the pipette in an upright position (the liquid will be aspirated)

Discharge sample

- Place the pipette tip(s) against the wall of the receiving vessel
- Press the pipetting button slowly and evenly down to the second stop (over-stroke) to empty the tip(s) completely
- Ensure while discharging the sample that the tip(s) are not immersed into the liquid that might be in the receiving vessel
- Wipe the pipette tip(s) against the receiving vessel wall over a distance of approx. 10 mm

Ejecting the tip(s)

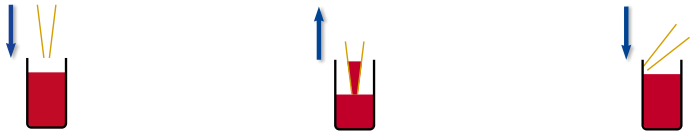
- Keep the pipetting button pressed while removing the pipette from the receiving vessel
- Let the pipetting button slide back slowly
- Press the tip ejection key to remove the tip(s)
- Correctly dispose of pipette tip(s)
- Store the pipette in an upright position when not in use (VITLAB® bench top rack/ shelf mount)

Optimal pipetting

For exact and precise analytical results, the following points should be considered, independent of the pipetting technique:

- The best results are obtained with pipette tips that are recommended by the manufacturer, since only they have been checked for an optimal fit with the pipette.
- A second important factor that can influence the analytical result is the quality of the tip material. VITLAB® pipette tips are manufactured from high quality polypropylene.
- Pipette tips are intended for single-use only. Reuse and cleaning of used pipette tips should be avoided because it can influence accuracy and lead to cross-contamination of samples.
- The pipette should be held vertically while aspirating the sample because an increase in the angle of inclination can result in volume errors.
- To obtain optimal results, the immersion depth of the tip should only be a few millimetres (depending on volume).
- The air-interface between piston and sample should be kept as small as possible. The smaller the air-interface the higher is the accuracy of the result. The color-code helps with the selection of the fitting pipette tip.

Forward pipetting

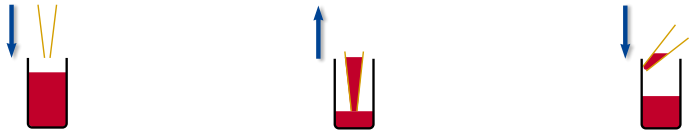


Starting position	1	2	3	4
First stop	↓	↑	↓	↑
Second stop			↓	↑

Press the pipetting button to the first stop and keep the button pressed. Immerse the tip 2 - 6 mm into the liquid.	Let the pipetting button slide back slowly. The liquid is aspirated.	Press the pipetting button slowly to the first stop; then press to the second stop to empty the tip completely.

Reverse pipetting

The reverse pipetting technique should be used to pipet viscous solutions, wetting solvents or media with high vapour pressure with air-interface pipettes. In contrast to forward pipetting, the reverse pipetting technique is as follows:



Starting position	1	2	3	4
First stop	↓	↑	↓	↑
Second stop	↓	↑		

Press the pipetting button to the second stop and keep the button pressed. Immerse the tip 2 - 6 mm into the liquid.	Let the pipetting button slide back slowly. The liquid is aspirated.	Press the pipetting button slowly to the first stop; some liquid will remain in the tip.

VITLAB® micropipette

The VITLAB® piston-operated pipettes are the ideal manual pipettes for demanding laboratory applications, and have all the features required by users: robust, with ergonomic shape and simple operation, completely autoclavable, highly accurate with simple calibration for long-lasting reliability.

The large, central pipetting button provides a uniform and smooth movement of the piston. For rapid replacement of the tips, the ergonomic eject button is placed easily accessible to the thumb on the front side. The VITLAB® micropipette is easy to use for both right- and left-handers. The 4-digit volume display with integrated zoom function and vertical arrangement of the numbers (top to bottom reading direction) ensures an **optimal readability of the volume** at all times. The desired volume can be set by rotating the volume-setting wheel with ease and precision. The clearly visible colour-coded frame of the volume display allows easy selection of the right pipette tip.

If necessary, e.g. for applications with non-aqueous solutions, the **integrated calibration function allows an adjustment without tools directly in the laboratory**. The corrosion-resistant piston and ejector ensure a long product life.

The micropipette is DE-M marked, CE-IVD compliant and is completely autoclavable at 121 °C (2 bar) according to DIN EN 285. Also available with DAkkS calibration certificate.

Included in delivery: VITLAB® micropipette, silicone oil resp. grease, sample bag with pipette tips, quality certificate, and instruction manual.

Volume µl	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	Tip µl	PU	Cat. No.
0.5 - 10	1.0	0.1	0.5	0.05	20	1	1641000
2 - 20	0.8	0.16	0.4	0.08	200	1	1641002
10 - 100	0.6	0.6	0.2	0.2	200/300	1	1641004
20 - 200	0.6	1.2	0.2	0.4	200/300	1	1641006
100 - 1000	0.6	6	0.2	2	1000	1	1641008
500 - 5000	0.6	30	0.2	10	5000	1	1641010
1000 - 10000	0.6	60	0.2	20	10000	1	1641012

* Calibrated to deliver ‚Ex'. * Accuracy and coefficient of variation based on the nominal volume (= maximum volume) printed on the instrument, if instrument, environment and distilled water are at the same temperature (20 °C), as well as uniform, jerk-free handling. The margins of error are under those specified in DIN EN ISO 8655-2.

VITLAB® micropipette -8/-12

The VITLAB® micropipettes -8 and -12 are characterized by their especially user-friendly operation while pipetting long series. They have all the features required by users: robust, completely autoclavable and highly accurate, with simple calibration for long lasting reliability, especially for established multichannel pipette applications, such as immunological assays, dilution series, or use with cell cultures in microtiter plates.

By using innovative plastic materials, the VITLAB® multichannel pipettes are **at the same time very robust and light-weight**. To ensure a long operating life, the plastic materials used are corrosion-resistant. The ergonomic finger rest coupled with the low weight contribute to comfortable handling of the pipettes. To provide an optimal and comfortable working position, the manifold can be rotated freely 360° in both directions.

The large, central pipetting button provides uniform and smooth movement of the piston. In addition, the short stroke of 12.5 mm reduces the risk of muscular disorders as a consequence of repeated stress, such as "Repetitive Strain Injury Syndrom" (RSI). The combination of the stepped design of the ejector and special rings made of FKM reduce the effort needed for ejecting the tips and thus provide comfortable operation of the pipette.

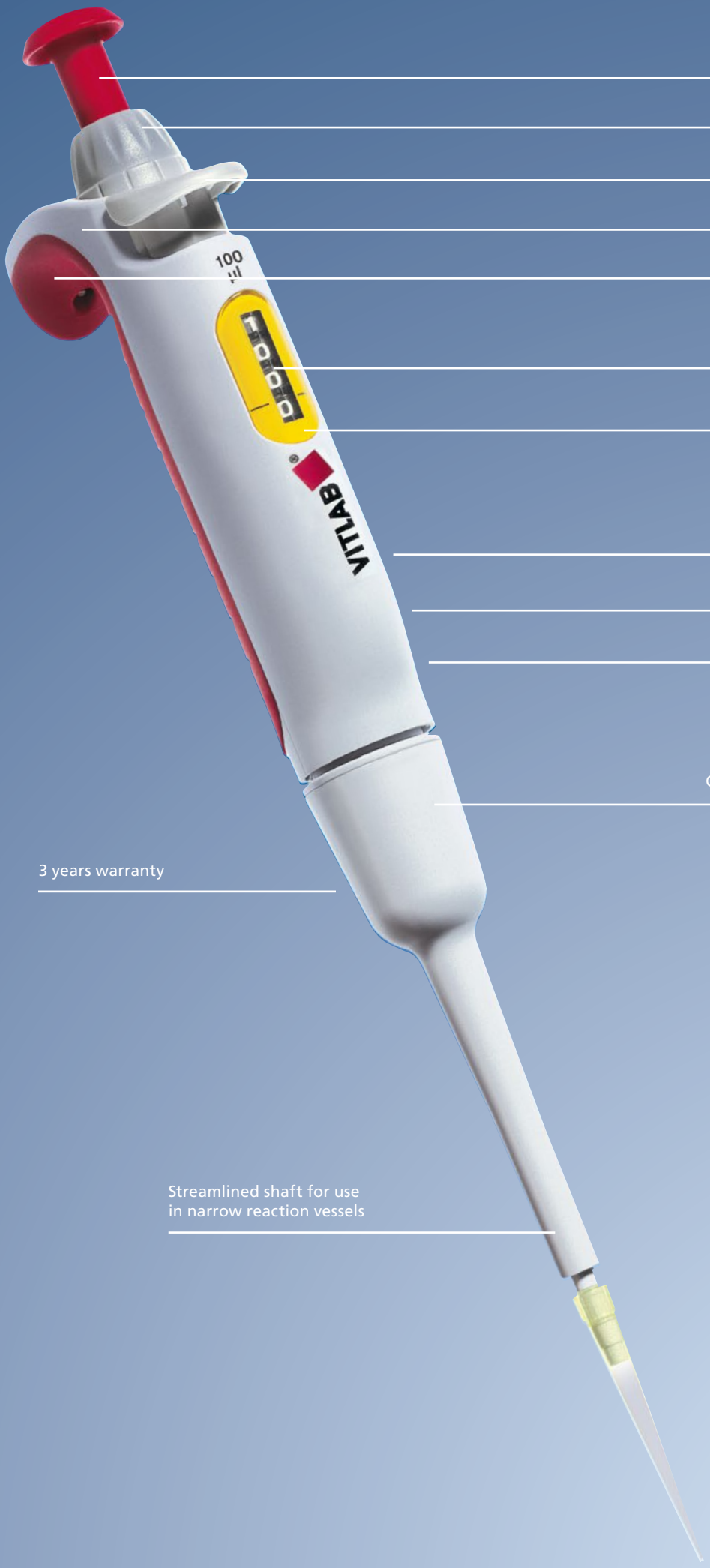
The multichannel pipettes are **especially service-friendly** for care and maintenance, as well as for calibration. If necessary, e.g. for applications with non-aqueous solutions, the integrated calibration function allows an adjustment without tools directly in the laboratory. Single shafts and seals can be easily removed, and thus can be directly cleaned or replaced.

The VITLAB® micropipette -8 and -12 are DE-M marked, CE-IVD compliant, and are completely autoclavable at 121 °C (2 bar) according to DIN EN 285. Also available with DAkkS calibration certificate or individual quality certificate.

Included in delivery: VITLAB® micropipette -8 or -12, mounting tool for nose cones, silicone grease, 8 or 12 V-rings including instructions and mounting plus demounting tool, quality certificate and instruction manual.

Volume µl	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	Tip µl	PU	Cat. No.
micropipette -8							
0.5 - 10	1.6	0.16	1.0	0.1	20	1	1608000
5 - 50	0.8	0.4	0.4	0.2	200	1	1608002
10 - 100	0.8	0.8	0.3	0.3	200/300	1	1608004
20 - 200	0.8	1.6	0.3	0.6	200/300	1	1608006
30 - 300	0.6	1.8	0.3	0.9	300	1	1608008
micropipette -12							
0.5 - 10	1.6	0.16	1.0	0.1	20	1	1612000
5 - 50	0.8	0.4	0.4	0.2	200	1	1612002
10 - 100	0.8	0.8	0.3	0.3	200/300	1	1612004
20 - 200	0.8	1.6	0.3	0.6	200/300	1	1612006
30 - 300	0.6	1.8	0.3	0.9	300	1	1612008

* Calibrated to deliver 'Ex'. Accuracy (A) and Coefficient of variation (CV) refer to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are under those specified in DIN EN ISO 8655-2. DE-M marked.



Central, large pipetting button

Simple volume adjustment

Large, ergonomic ejection button

Integrated calibration function

Ergonomic finger rest

Precise, 4-digit volume display

Color-coded

Lightweight but still robust

Completely autoclavable at 121 °C

CE-marked

Corrosion-resistant piston and ejector

3 years warranty

Streamlined shaft for use
in narrow reaction vessels

for smooth movement of the piston

for left- and right-handers

for rapid replacement of the tips

for easy calibration without the need for tools

that allows comfortable handling

with integrated zoom function for optimal readability

for easy tip selection

through the use of innovative plastic materials

as per DIN EN 285

according to IVD-directive 98/79 EG

for extended durability

Manifold with 360° free rotation in either direction to offer optimal working positions

Especially service-friendly: Single shafts and seals can be easily removed, and thus can be directly cleaned or replaced in the laboratory

The combination of the stepped design of the ejector and special rings made of FKM reduces the effort needed for ejecting the tips

VITLAB® micropipette Starter-Sets

Each VITLAB® Starter Set includes 3 variable VITLAB® micropipettes with different volumes and associated, color-coded tip boxes, as well as 3 rack mounts for appropriate storage of your new VITLAB® micropipettes.

Our micropipettes are DE-M marked, CE-IVD compliant and are completely autoclavable at 121 °C (2 bar) according to DIN EN 285.

Starter Set “Mini”

Scope of delivery:

- VITLAB® micropipette 0.5 - 10 µl
- VITLAB® micropipette 10 - 100 µl
- VITLAB® micropipette 100 - 1000 µl
- Tip-Box 0.5 - 20 µl
- Tip-Box 2 - 200 µl
- Tip-Box 50 - 1000 µl
- Rack mount (3x)
- Product & application brochure

Cat. No.: 33331

Starter Set “Classic”

Scope of delivery:

- VITLAB® micropipette 2 - 20 µl
- VITLAB® micropipette 20 - 200 µl
- VITLAB® micropipette 100 - 1000 µl
- Tip-Box 2 - 200 µl (2x)
- Tip-Box 50 - 1000 µl
- Rack mount (3x)
- Product & application brochure

Cat. No.: 33332

Starter Set “Maxi”

Scope of delivery:

- VITLAB® micropipette 100 - 1000 µl
- VITLAB® micropipette 500 - 5000 µl
- VITLAB® micropipette 1000 - 10000 µl
- Tip-Box 50 - 1000 µl
- Tip-Box 0.5 - 5 ml
- Tip-Box 1 - 10 ml
- Rack mount (3x)
- Product & application brochure

Cat. No.: 33333

Accessories for VITLAB® micropipettes

With the practical rack mount and freely rotatable bench-top stand, VITLAB® micropipettes can be stored safely and ready to use.

Description	PU	Cat. No.
Wall mount for 1 pipette	1	1672000
Bench-top stand for 6 singlechannel or 6 multichannel instruments	1	1672002
Filter for pipette, 5 ml	25	1672010
Filter for pipette, 10 ml	25	1672012
Silicone oil for pipettes, up to 20 µl	1	1672015
Silicone grease for pipettes 5 ml / 10 ml and multichannel pipettes	1	1672016
Silicone grease for pipettes 100 to 1000 µl	1	1672017
Fluorostatic grease for multichannel pipettes	1	1670050

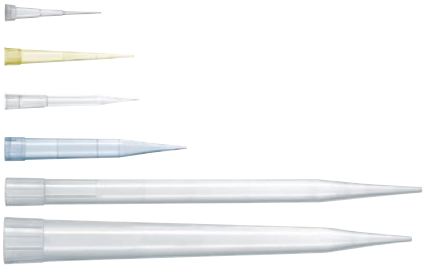
Reagent reservoir, non-sterile, PP

Transparent, with lid to guard against contamination and spilling out of contents during movement. Optimally suited for working with multichannel pipettes. Autoclavable at 121 °C (2 bar) according to DIN EN 285.

Volume ml	PU	Cat. No.
60	10	319099

Pipette tip selection guide
Which pipette tip will fit my VITLAB® micropipette?

Nominal volume VITLAB® micropipettes							Nominal volume VITLAB® micropipette -8/-12				Tip volume
10 µl	20 µl	100 µl	200 µl	1000 µl	5 ml	10 ml	50 µl	100 µl	200 µl	300 µl	
◆											0.5 - 20 µl
	◆	◆	◆				◆	◆	◆		2 - 200 µl
		◆	◆				◆	◆	◆	◆	5 - 300 µl
				◆							50 - 1000 µl
					◆						0.5 - 5 ml
						◆					1 - 10 ml



Pipette tips free of DNA and RNase

VITLAB® pipette tips are manufactured in a state-of-the-art cleanroom and are automatically palletized and packaged. This ensures a high level of quality, so that all palletized tips up to 1000 µl are **free of DNA (< 40 fg), RNase (< 8.6 fg) endotoxins (< 1 pg) and ATP (< 1 fg)**.

Only pure, high quality polypropylene, that is free of DiHEMDA and oleamide, is used for the production of our tips. The tips are **manufactured without addition of plasticizers**. Coloured tips (e.g. yellow and blue, in bags) are, of course, only treated with cadmium-free colour pigments.

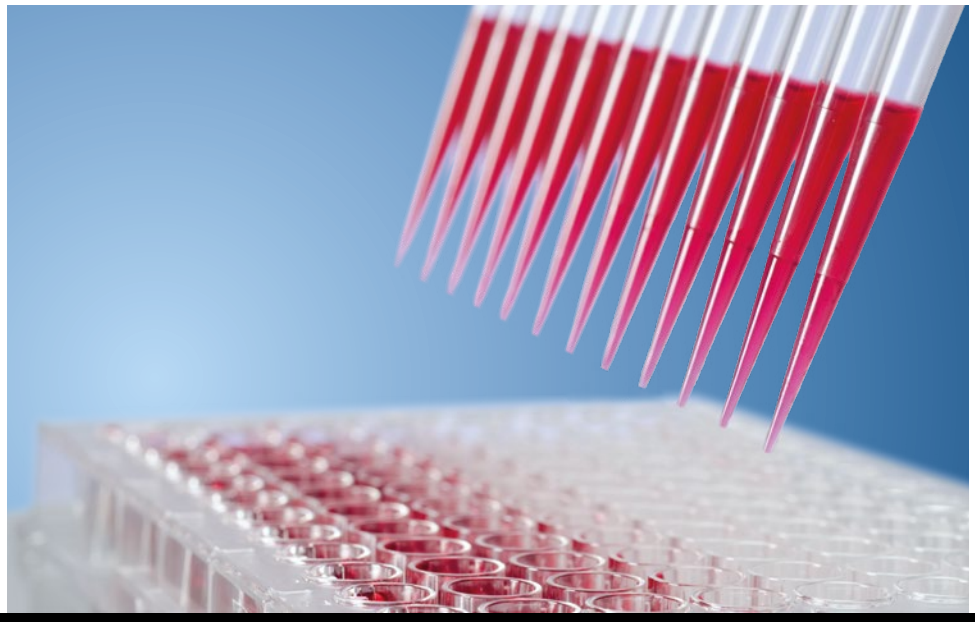
All tips up to 1000 µl are graduated and are autoclavable at 121 °C (2 bar) according to DIN EN 285.

Optimised packaging system

To match the high quality of our pipette tips, the packaging system for the tips is optimized and has a user-friendly design. All components are produced in a cleanroom.

The Tip-Box has **two opening functions**: standard delivery is with a hinged lid which can be turned 180° and then used as a snap-on lid according to user preference. The box can be easily opened and closed with only one hand. Furthermore, empty boxes are available that can be filled with VITLAB® tips by the user.

Bulk tips are delivered in **resealable bags** to minimize the risk of contamination in the lab.

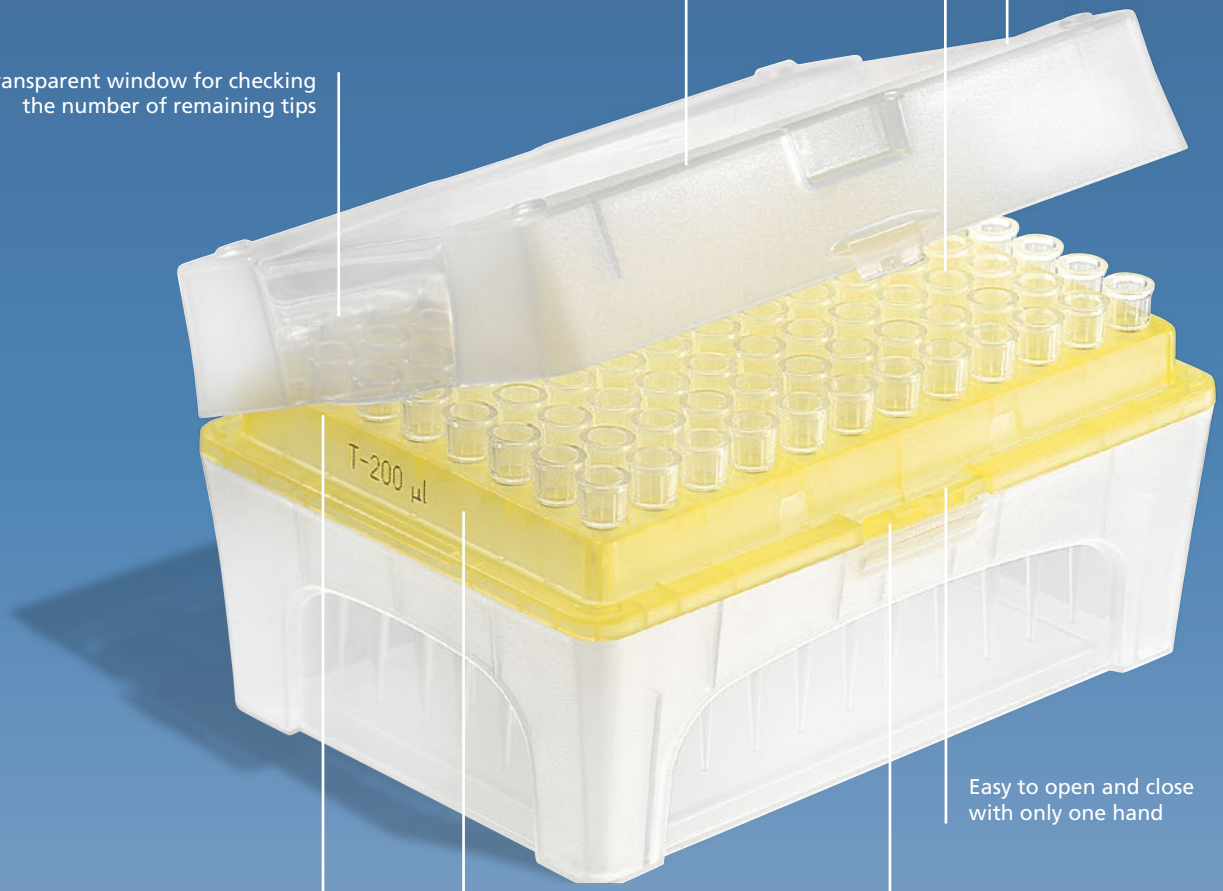


Also available without tips

Stackable and autoclavable at 121 °C acc. to DIN EN 285

Lid can be turned 180° to function as hinged or snap-on lid depending on user preference

Transparent window for checking the number of remaining tips



Easy to open and close with only one hand

Rimless mounting plate for optimal handling of multichannel pipettes

Colour-coded mounting plate with nominal volume labeling

No shifting or bending of the mounting plate due to clamping device and use of particularly sturdy polypropylene

High purity

Applications in molecular biology and biochemical analysis require a high level of purity in order not to adulterate results of experiments. Molecules and enzymes such as DNA, RNases and endotoxins are very stable and cannot be completely inactivated or destroyed by sterilization procedures. RNases may even fold back after denaturation. When working with microorganisms and nucleic acids a common difficulty is their ubiquitous occurrence (on hands, in saliva); therefore, for example, it is essential to wear gloves. To avoid contamination with nucleic acids, proteins and microorganisms from human contact, the production process of our pipette tips is largely automated in a cleanroom.

ATP is a good indicator for the presence or absence of biological contamination. It is a high-energy molecule that is produced by all living cells. Because of their ability to cut DNA or RNA, contamination with DNA, DNases and RNases can, for example, manipulate biomolecular amplification techniques such as PCR. To prevent enzymatic degradation, it is of major importance, that pipette tips are free of RNases.

Packaging variations

VITLAB® pipette tips are available in the variations palletized in the Tip-Box and packed in bags. Additionally, empty Tip-Boxes for self-filling are available. Tip-Boxes up to 1000 µl are stackable and their format conforms to the common 96 (8x12) unit format.

Resealable bags

All tips up to 1000 µl are produced under cleanroom conditions, automatically shrink-wrapped in reclosable bags and packaged in cartons. The article number, volume range and lot number of the tips are printed on every bag.

Tip-Box (up to 1000 µl)

PP box with functional hinged and snap-on lid. For all volume ranges up to 1000 µl in practical 8x12 format. Stackable and autoclavable at 121 °C according to DIN EN 285.

Tip-Box 5/10 ml

PP box with fitted lid. Filled with 5 ml (28 pcs.) or 10 ml (18 pcs.) tips. The box is autoclavable at 121 °C according to DIN EN 285.

Pipette tips

VITLAB® pipette tips are made from high-quality polypropylene and are autoclavable at 121 °C (2 bar) according to DIN EN 285. The raw material used is free from additives such as DiHEMDA (di(2-hydroxyethyl)methyldodecyl-ammonium) and oleamide (9-octadecenamide) that often cause interference, particularly in biological labs. All palletized pipette tips up to 1000 µl are **free of DNA (< 40 fg), RNase (< 8.6 fg), endotoxins (< 1 pg) and ATP (< 1 fg)**.

The pipette tips are **DE-M marked, CE marked according to the IVD guideline 98/79 EC** and optimally suited for VITLAB® micropipettes.

Furthermore, the tips are compatible with most pipette models from BRAND, GILSON®, Thermo Fisher Scientific FINNPIPETTE®, Eppendorf® and sartorius® Biohit®. The 5 ml tip is only tested for VITLAB, BRAND and Thermo Fisher Scientific FINNPIPETTE®. The 10 ml tip is only tested for VITLAB, BRAND and Eppendorf®. Note: Pipette shafts are subject to modification and should be checked before use. The fit depends on the manufacturer, pipette type, serial number, and date of manufacture, among other things.

Pipette tips, 0.5 – 20 µl

DE-M 121°C CE IVD

PP, non-sterile with graduation at 2 and 10 µl. Length: 46 mm. Slim tip for contact-free pipetting into microtiter plates. Tip-Box with gray mounting plate for easy identification; palletized tips are colourless.

Variation	Packaging	PU	Cat. No.
Bag, Standard	2 bags with 1000 tips	2000	148894
Bag, Maxi	10 bags with 1000 tips	10000	155494
Tip-Box, filled	Box with 96 tips on gray mounting plate	5	149794
Tip-Box, empty	Box with gray mounting plate, without tips	1	155400

Pipette tips, 2 – 200 µl

DE-M 121°C CE IVD

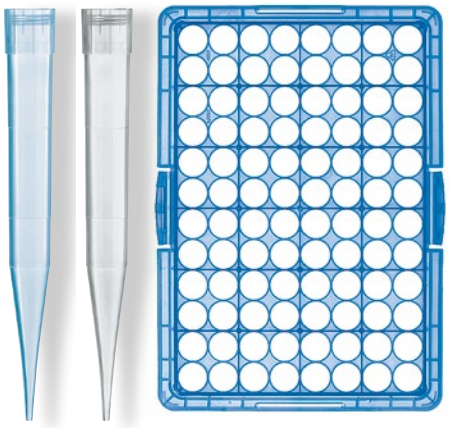
PP, non-sterile with graduation at 20 and 100 µl. Length: 50 mm. Tip-Box with yellow mounting plate for easy identification; palletized tips are colourless. Tips in bags are coloured yellow.

Variation	Packaging	PU	Cat. No.
Bag, Standard	1 bag with 1000 tips	1000	148994
Bag, Maxi	10 bags with with 1000 tips	10000	155694
Tip-Box, filled	Box with 96 tips on yellow mounting plate	5	149994
Tip-Box, empty	Box with yellow mounting plate, without tips	1	155600

Pipette tips, 5 - 300 µl

PP, non-sterile with graduation at 50, 100 and 300 µl. Length: 53 mm. Also suitable for pipettes with yellow colour-code (see selection guide p. 37). Tip-Box with green mounting plate for easy identification; palletized tips are colourless. Tips in bags are also colourless.

Variation	Packaging	PU	Cat. No.
Bag, Standard	1 bag with 1000 tips	1000	149094
Bags, Maxi	10 bags with 1000 tips	10000	155894
Tip-Box, filled	Box with 96 tips on green mounting plate	5	150094
Tip-Box, empty	Box with green mounting plate, without tips	1	155800



Pipette tips, 50 - 1000 µl

PP, non-sterile with graduation at 250, 500 and 1000 µl. Length: 70 mm. Tip-Box with blue mounting plate; palletized tips are colourless. Tips in bags are coloured blue.

Variation	Packaging	PU	Cat. No.
Bags, Standard	2 bags with 500 tips	1000	149194
Bags, Maxi	10 bags with 500 tips	5000	155994
Tip-Box, filled	Box with 96 tips on blue mounting plate	5	150194
Tip-Box, empty	Box with blue mounting plate, without tips	1	155900

Pipette tips, 0.5 - 5 ml

PP, non-sterile. Length: 160 mm. Diameter: approx. 9.6 mm.
Slim shape for pipetting into narrow vessels such as measuring flasks with NS 12/21.

Variation	Packaging	PU	Cat. No.
Bag, Standard	1 bag with 200 tips	200	146294
Tip-Box, filled	Box with 28 tips	1	150294

Pipette tips, 1 -10 ml

PP, non-sterile. Length: 156.5 mm. Diameter: approx. 15 mm.

Variation	Packaging	PU	Cat. No.
Bag, Standard	2 bags with 100 tips	200	146494
Tip-Box, filled	Box with 18 tips	1	150394

Perfection in Liquid Handling

HIGH EFFICIENCY PIPETTING

VITLAB®
Competence in Labware

Working with pipette helpers

Motorized pipette helpers

Pipette helpers are indispensable for working with pipettes. Pipetting by mouth or with a hose and a mouthpiece is prohibited because the risk of injury or infection is too high. Thus, the use of pipette helpers is recommended.

A basic distinction is made between manual and motorized pipette helpers. A motorized pipette helper such as the VITLAB pipeo® is particularly suitable for pipetting larger series (e.g., in cell culture).

Liquid discharge: Free delivery or blow out?

Selection of the delivery mode depends on the application. The primary mode employed in analytical laboratories is "free delivery". In microbiology, the focus is on the uniform and rapid measurement of nutrient solutions. Thus, the "blow-out" mode is preferred in this field of application.

The special valve system in the VITLAB pipeo® facilitates the continuous and highly exact adjustment of the pipetting rate through the operation of two buttons with just one hand, making highly sensitive operation possible.
In addition, an integrated non-return valve together with a membrane filter effectively protects against the penetration of liquids.
The VITLAB pipeo® can be used for all pipettes from 0.1 to 200 ml.

Handling: Pipetting is controlled through two large function buttons:

Dispensing
The dispensing rate continuously increases the further the button is pressed.

Aspirate
Press the upper pipetting button to take up the pipetting medium. The further the button is pressed in, the faster the pipette will fill.

Manual pipette helper

Manual pipette helpers, for example, such as the VITLAB maneus®, are for pipetting small volumes, and are used especially in chemical laboratories.
The special valve system that enables the instrument to be used by left- and right-handed personnel makes the operations easy and fatigue-free with all standard pipettes from 0.1 to 200 ml, and also makes sensitive and exact adjustment of the meniscus possible.

Handling:

Creating a vacuum

Press the suction bellows together.

Filling

Move the pipetting lever upwards. The farther up the lever is pressed, the faster the pipette will fill.

Adjusting the meniscus / Dispensing by "free delivery"

Move the pipetting lever gently downwards. The meniscus decreases. Release the lever, and the meniscus stops. For emptying, move the lever all the way down.
To comply with Class A accuracy, do not blow out the residual liquid.

Blowing out

When pipetting viscous media with "free delivery", the pipette tip frequently does not empty completely. In these cases, empty the remaining residues by pressing on the blow-out button.

VITLAB pipeo®

CE

For all pipettes from 0.1 to 200 ml.
With the VITLAB pipeo® pipette controller, pipette handling is simple and comfortable. The ergonomic handle - **very light weight** at about 190 grams - and excellent balance all contribute to ease of operation. The speed can be adjusted easily, continuously and exactly with one hand using two buttons. A 50 ml pipette can be filled comfortably in less than ten seconds. The liquid release can be done either by gravity delivery when calibrated 'Ex' (to deliver), or in blow out mode using the battery-operated motor.
Pipettes are held securely and tightly in the exchangeable adapter. Liquid vapours are purged directly to protect the instrument.
One full charge of the nickel-metal hydride battery allows 8 hours of non-stop pipetting. The charge level of the recyclable battery is shown by the LED indicator. Defective batteries are easily replaced. To avoid surprises, the LED light changes from green to red two hours before the battery must be recharged. **The VITLAB pipeo® can still be operated while the battery is being recharged**.

Included in delivery:
VITLAB pipeo®, battery charger (100 - 240 V, 50/60 Hz), four plug adapters (EU, UK, US/J, AUS), battery, battery compartment cover, two replacement 0.2 µm membrane filters, instruction manual.

Type	PU	Cat. No.
pipeo®	1	1631500

Charge indicator (LED)

Mode selector
(gravity delivery / blow-out)

Direct discharge of
liquid vapors

Battery compartment cover

Pipetting buttons

Adapter for a secure
attachment of the pipettes,
from 0.1 to 200 ml

Ergonomic formed
design

Single-hand operation

VITLAB maneus®

121°C

The VITLAB maneus® pipette controller enables both left- and right-handers to operate all normal bulb and graduated pipettes easily and fatigue-free. Its safe and easy handling allows even inexperienced users **to adjust the meniscus precisely**.

With the new design, unscrewing the adapter enables easy and fast replacement of the hydrophobic membrane filter, which **protects the instrument against fluid penetration**.

The valve system is optimised so that liquids can be drawn up simply, without exerting pressure. The highly sensitive filling and discharge of liquids are controlled gently by the pipetting knob. Thus, the suction element provides rapid filling of the pipette (capacity: 50 ml in less than 10 seconds). The discharge bellows are used for the emptying (blow-out) of the pipette. The specially moulded intake cone ensures secure seating for all normal bulb and graduated pipettes (0.1 to 200 ml).

The VITLAB maneus® is simple to dismantle, easy to clean, and completely autoclavable at 121 °C (2 bar) according to DIN EN 285.

For all normal bulb and graduated pipettes from 0.1 to 200 ml. With replacement 3 µm membrane filter and instruction manual.

Type	PU	Cat. No.
maneus®	1	1630500

Accessories for VITLAB pipeo® & maneus®

Description	PU	Cat. No.
Membrane filter, 0.2 µm, sterile, VITLAB pipeo®	1	1670647
Membrane filter, 0.2 µm, non-sterile, VITLAB pipeo®	10	1670648
Membrane filter, 3 µm, non-sterile, VITLAB pipeo®, VITLAB maneus®	10	1670650
Wall rack, VITLAB pipeo®	1	1670660


Suction bellows for fast pipette filling (50 ml in less than 10 seconds)
Button for emptying blow-out pipettes
The pipetting knob allows sensitive intake and delivery of fluids
VITLAB
maneus®
The perfectly harmonized valve unit ensures effortless liquid intake
A replaceable hydrophobic membrane filter protects the interior from penetrating liquids
Unscrewing the adapter enables easy cleaning and replacement of the hydrophobic membrane filter
An especially designed intake cone allows the use of pipettes from 0.1 ml to 200 ml
PP

CE mark / CE-IVD Guidelines

IVD Guidelines of the EU

On 7 December, 1998, the EU "Guidelines for In Vitro Diagnostic Devices" (IVD Guidelines) were published in the Official Journal of the European Communities, and thus came into force. The Guidelines were transposed into German National Law on 1 January, 2002, as a corresponding modification of the German Medical Devices Act (MPG). Consequently, in vitro diagnostic devices are considered medical devices.

Definition: Medical devices*

Medical devices are all instruments, apparatus, devices, materials, or other objects including software that are intended by the manufacturer for use in humans:

- for the purpose of detection, prevention, monitoring, treatment, alleviation or compensation of diseases, injuries or disabilities;
- for the purpose of investigation, replacement or modification of the anatomy or of a physiological process;
- for the purpose of control of conception. Pharmacologically or immunologically active agents are excluded, as these are regulated by the German Pharmaceuticals Law.

Definition: In vitro Diagnostic Devices (IVD)*

"In vitro diagnostic devices" are medical devices that are used for in vitro investigations of samples derived from the human body, including donated blood and tissue. Included are reagents, calibration substances or devices, control substances or devices, equipment, instruments, apparatus, systems ,or also sample containers, if they are specifically intended by the manufacturer for use in medical tests. "In vitro diagnostic devices" serve mainly to provide information on:

- physiological or pathological conditions;
- congenital anomalies;
- monitoring of therapeutic measures.

CE Mark

With the CE mark on a product, the manufacturer affirms that the product complies with the requirements for products of that type established by the EU Guidelines and, as necessary, has undergone the required testing. The manufacturer applies this mark to the product and additionally produces a Conformity Declaration that certifies the conformity of the product with the cited guidelines and standards.

The medical products supplied by VITLAB are all included in the class of in vitro diagnostic (IVD) devices.

This includes, for example:

- VITLAB® micropipettes
- Pipette tips
- Urine bottles
- Microtubes

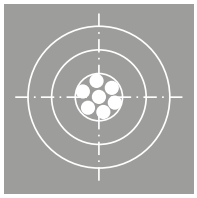
* See the definitions according to MPG § 3 (Definition of Terms)

Accuracy

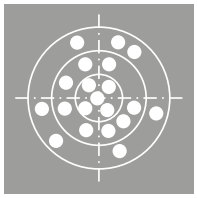
What do "tolerance, accuracy, coefficient of variation, and precision" mean in volumetric measurements?

Graphic illustration of precision and accuracy

The dart board simulates the volume range around the centred nominal value, the white dots simulate the different measured values of a specified volume.

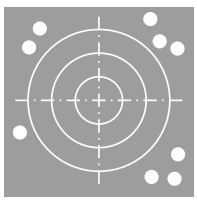


Good accuracy: All hits are near the centre, i.e., the nominal value.
Good precision: All hits are close together.
Result: The manufacturing process is well controlled by an accompanying quality assurance program. Minimal systematic deviations and a narrow variance in products. The permissible limits are not exceeded. There are no rejects.



Good accuracy: On average, the hits are evenly distributed around the centre.
Poor precision: No substantial errors, but hits widely scattered.
Result: All deviations are "equally probable". Instruments exceeding the permissible tolerance should be rejected.

Poor accuracy: Although all hits are close together, the centre (nominal value) is still missed.
Good precision: All hits are close together.
Result: Improperly controlled production, with systematic deviation. Instruments exceeding the permissible tolerance should be rejected.



Poor accuracy: The hits are far removed from the centre.
Poor precision: The hits are widely scattered.
Result: These volumetric instruments are of inferior quality.

Calculation formulae

The accuracy of glass volumetric instruments is commonly defined by "Tolerance Limits", whereas for liquid handling instruments the statistical terms "Accuracy [%]" and "Coefficient of Variation [%]" have been established.

Tolerance

$$Tol. \geq | V_{meas.} - V_{nom.} |$$

The term "tolerance" (tol.) in the corresponding standards defines the maximum permissible deviation from the nominal value.

Accuracy

$$A[\%] = \frac{\overline{V} - V_{nom.}}{V_{nom.}} \cdot 100$$

Accuracy (A) indicates the closeness of measured mean volume to the nominal value, i.e., systematic measurement deviation. Accuracy is defined as the difference between the measured mean volume ($\overline{V}$) and the nominal value ($V_{nom.}$), related to the nominal value in percent.

Coefficient of Variation

$$CV[\%] = \frac{s \cdot 100}{\overline{V}}$$

The coefficient of variation (CV) indicates the closeness of values from repeated measurements, i.e., random measurement deviation. The coefficient of variation is defined as standard deviation in percent, related to the mean volume.

Partial volumes

$$A_{part.}[\%] = \frac{V_{nom.}}{V_{part.}} \cdot A_{nom.}\,\%$$

(analogous to $CV_{part.}$ %)
Generally, A and CV are based on the nominal volume ($V_{nom.}$). These data in percent must be converted to partial volumes ($V_{part.}$). By contrast, there is no conversion for partial volumes if A and CV are stated in volume units (e.g. ml).

Tolerance from A and CV

$$Tol. \geq \frac{| A\% | + 2CV\%}{100\ \%} \cdot V_{nom.}$$

To a good approximation, the tolerance, e.g. for the nominal volume ($V_{nom.}$), can be calculated from the accuracy and coefficient of variation.

Precision

If the variance in the individual measurement results about the mean volume $\overline{V}$ is given in units of volume, this relates to precision.

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