

Common Laboratory Equipment

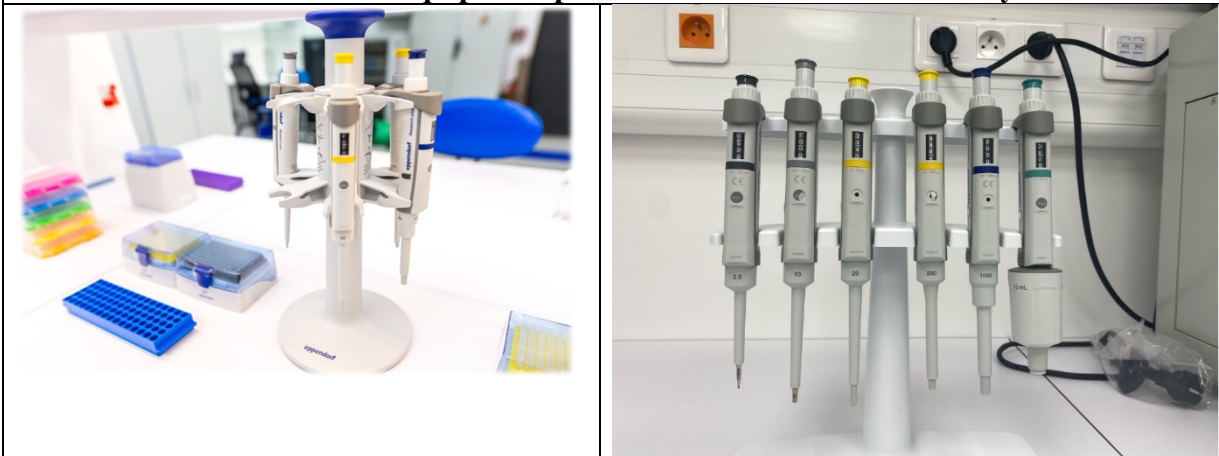
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1 Pipettes

1.1 AIR DISPLACEMENT PIPETTES

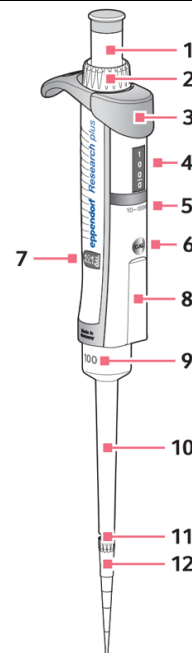
The Eppendorf Research plus pipette utilizes piston-driven action to accurately draw and deliver liquid samples. It's operated on the air cushion principle. Prior to use, a compatible pipette tip must be securely attached. Depending on the pipette model, volumes ranging from 0.1µL to 10 mL can be dispensed with precision.

Photos of the equipment present in the ELIBIO laboratory



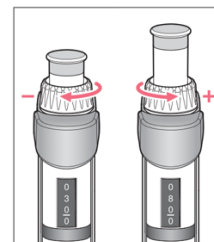
Structure

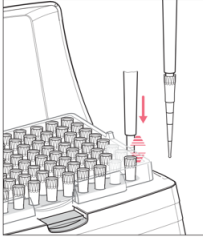



- 1 Dispensing button
- 2 Volume setting ring
- 3 Ejector
- 4 Volume display
- 5 Single-channel upper part with part with nominal volume
- 6 Adjustment opening
- 7 Adjustment display
- 8 Labeling area
- 9 Single-channel lower part with nominal volume
- 10 Ejector sleeve
- 11 Tip cone
- 12 Pipette tip



Operation


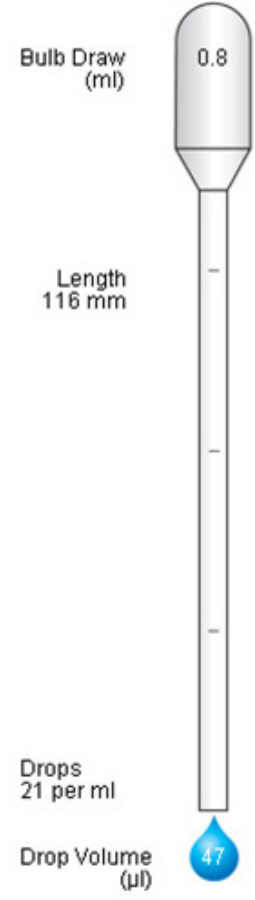
- 1 Set the Volume.



<p>2 Attach the pipette tips.</p>	
<p>3 Press down the dispensing button to the first stop.</p>	
<p>4 Immerse the pipette tip vertically in the liquid.</p>	
<p>5 Maintain the immersion depth and let the dispensing button slide back slowly.</p>	
<p>6 Wait until the liquid has been aspirated.</p>	
<p>7 Remove the pipette tip from the liquid.</p>	
<p>8 If necessary, wipe the pipette tip against the tube inner wall.</p>	
<p>9 Place the pipette tip on the tube inner wall at a steep angle.</p>	
<p>10 Slowly press down the dispensing button to the first stop.</p>	
<p>11 Wait until the flow of liquid stops.</p>	
<p>12 Press down the dispensing button to the second stop.</p>	
<p>13 The pipette tip is completely emptied.</p>	
<p>14 Hold down the dispensing button and wipe the pipette tip on the tube inner wall.</p>	
<p>15 Eject the tip.</p>	
<p>Demonstration video</p>	<p>References</p>
<p>https://www.youtube.com/watch?v=Wx8clzD-CO4&list=PLVE22aVczVeYrZS2bChP1BMHckjwZYtHA&index=1</p>	<ul style="list-style-type: none"> • https://www.eppendorf.com/product-media/doc/en/186591/Eppendorf_Liquid-Handling_Operating-manual_Research-plus_Eppendorf-Research-plus.pdf • https://www.youtube.com/watch?v=Wx8clzD-CO4&list=PLVE22aVczVeYrZS2bChP1BMHckjwZYtHA&index=1


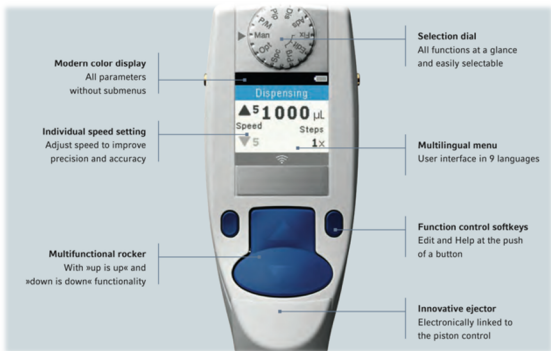
1.2 PASTEUR PIPETTES

Pasteur pipettes, also called droppers or eye droppers, are tools used in labs to transfer small amounts of liquids. Traditionally made from glass, plastic pipettes are now just as common.

Photos of the equipment present in the ELIBIO laboratory	
	
Operation	
<ol style="list-style-type: none"> 1. Hold the pipette upright with your little and ring finger just beneath the rubber ball/bulb. 2. Gently dip the tip of the pipette just below the surface of the liquid you want to transfer. 3. Squeeze the bulb or cap gently, creating a vacuum effect. 4. Once the desired amount of liquid is drawn, completely release pressure on the bulb or cap. 5. Slowly lift the pipette, keeping the tip slightly above the liquid to prevent drips. 6. Release the desired amount of liquid, by counting the number of droplets. 	
Demonstration video	References
<p>https://www.youtube.com/watch?v=FMzAOuvTJQk&t=59s</p>	<ul style="list-style-type: none"> • https://conductscience.com/guide-to-pipettes/#:~:text=Pinch%20the%20rubber%20teat%20of,the%20liquid%20to%20go%20up. • https://www.alphalabs.co.uk/lw4283 • https://pipette.com/pipettes/pasteur-pipettes.html

1.3 ELECTRICAL PIPETTES

The Eppendorf Xplorer is a single-channel pipette, handling liquid transfers with precision and ease. These electronic pipettes handle volumes from 0.1 μL to 10 mL, while minimizing the potential for errors.

Photos of the equipment present in the ELIBIO laboratory	
	
Operation	
<ol style="list-style-type: none"> 1 Set the Volume. 2 Attach the pipette tips. 3 Immerse the pipette tip vertically in the liquid. 4 Maintain the immersion depth and press the up button. 5 Wait until the liquid has been aspirated. 6 Remove the pipette tip from the liquid. 7 If necessary, wipe the pipette tip against the tube inner wall. 8 Place the pipette tip on the tube inner wall at a steep angle. 9 Slowly press the down button. 10 Wait until the flow of liquid stops. 11 Eject the tip. 	
Demonstration video	References
<p>https://www.youtube.com/watch?v=eCuvb6i09io</p>	<ul style="list-style-type: none"> • https://www.eppendorf.com/gb-en/eShop-Products/Liquid-Handling/Manual-Pipettes-Dispensers/Eppendorf-Xplorer-Eppendorf-Xplorer-plus-p-PF-191054 • https://www.eppendorf.com/product-media/doc/en/1497279/Eppendorf_Liquid-Handling_Brochure_Pipettes_Dispensers_Natural-Winners.pdf

1.4 VOLUMETRIC PIPETTES

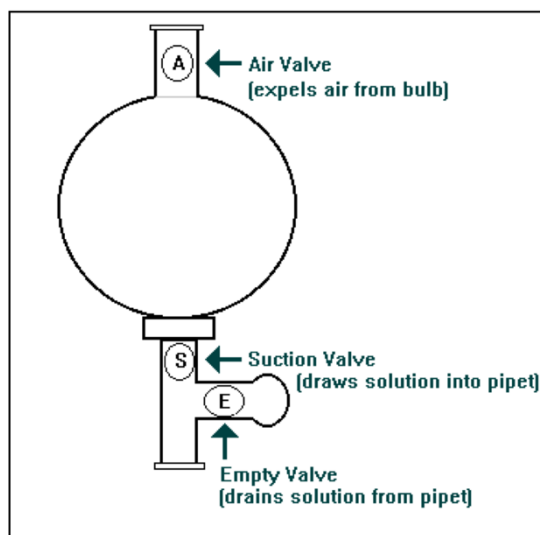
Volumetric pipettes, often called bulb pipettes, are the go-to tools in laboratories for dispensing precise, single-volume samples of liquid. They are typically used with a pipette filler and can handle volumes ranging from 0.5 mL to 100 mL. Their design, featuring a bulb between elongated sections and a single graduation mark.

Photos of the equipment present in the ELIBIO laboratory



Operation

- 1 Squeeze the A-valve and compress the bulb to expel air.
- 2 Place the tip in the water and squeeze the S-valve to fill the pipet (keep the tip submerged).
- 3 Repeat step 2 multiple times to wet down the pipette.
- 4 Place the tip in the water and squeeze the S-valve to fill the pipet (keep the tip submerged). Release the S-valve when the water is 20mm above the calibration mark.
- 5 Gently squeeze the E-valve to drain the water to the mark.
- 6 Dry the lower outside of the pipet after filling to remove excess water at the tip.
- 7 Squeeze the E-valve to completely empty the pipette.



Demonstration video

<https://www.youtube.com/watch?v=SrK1TUh7m5Q>

References

- <https://www.nist.gov/system/files/documents/2017/04/28/D201-031714-use-of-pipets-june2014.pdf>
- <https://www.fishersci.co.uk/gb/en/browse/90140057/volumetric-pipets>

1.5 ELECTRIC PIPETTE CONTROLLER + SEROLOGICAL PIPETTES

Pipette controllers are designed to streamline the precise handling of various liquids by enabling swift and accurate drawing and dispensing. Equipped with different modes and variable speeds to accommodate various viscosity levels and volume requirements, these controllers ensure flexibility in liquid handling tasks. They are mainly used with serological pipettes.

Photos of the equipment present in the ELIBIO laboratory



Structure

- 1 Speed control and precision
- 2 Ergonomics
- 3 Battery status display



Operation

- 1 Choose the right serological pipettes.
- 2 Put the pipette onto the pipette controller.
- 3 Place the tip in the liquid and press the up button until you're close to the desired volume.
- 4 Bring the mark of the desired volume to eye level (for most accuracy) and press up button until the liquid arrived at the desired volume.
- 5 Press down button until the pipette is emptied to the most bottom graduation.



Demonstration video

<https://uk.vwr.com/store/category/pipette-controllers/565751>

References

- <https://uk.vwr.com/store/category/pipette-controllers/565751>

2 FLASKS

2.1 ERLLENMEYER FLASK

Description:

Conical shape with a wide flat bottom and tapered neck.

Common Uses:

Pouring, mixing, storage, cooling, heating, filtrating and incubating

Variants:

Available in sizes from 25 mL to 6000 ml, with wide or narrow mouth designs.

Materials:

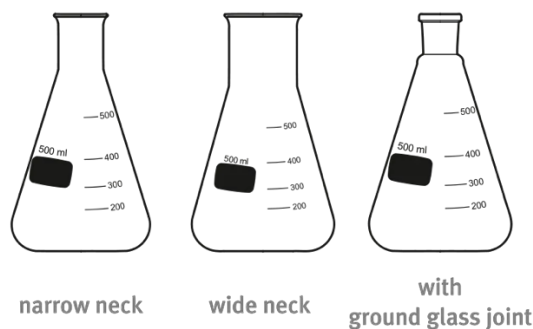
borosilicate glass or plastic.

Closure Options:

Screw caps or stoppers.

Important Note:

Graduations on graduated flasks are approximations, not for precise measurements.

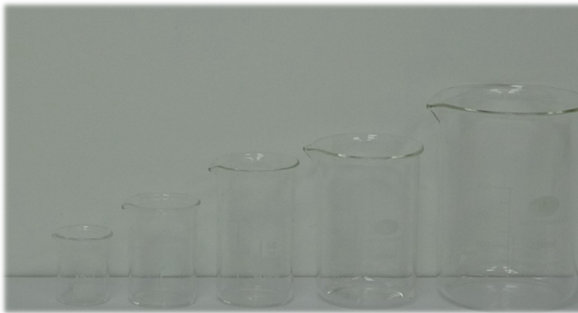
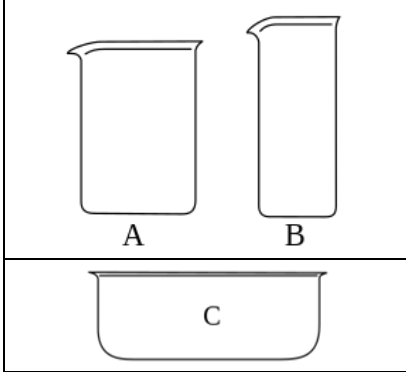
**Demonstration video**

- <https://www.youtube.com/watch?v=I9fa9G-krzo>
- <https://www.youtube.com/watch?v=SaOWaR95YoU>


References


- <https://www.fishersci.co.uk/gb/en/browse/90111066/erlenmyer-flasks>
- <https://microbeonline.com/conical-flask/>
- <https://labproinc.com/blogs/lab-glassware-and-glassware-equipment/ultimate-guide-to-erlenmeyer-flasks>

2.2 BEAKER

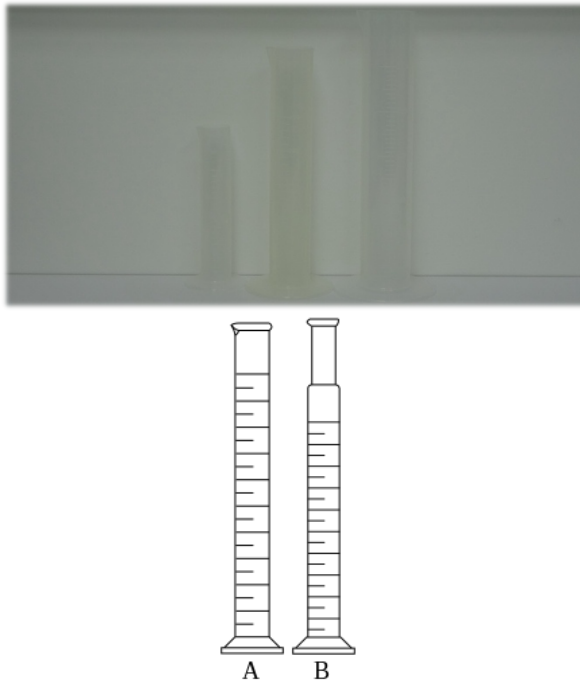
<p>Description: Cylindrical with a flat bottom and a lip for pouring.</p> <p>Common Uses: Mixing, heating, collecting liquid (after titration for example) and holding liquids.</p> <p>Variants: Available in various sizes and shapes: Griffin form (A), Berzelius form (B) and crystallizer form</p> <p>Materials: Glass or plastic.</p> <p>Handle with Care: Not designed for precise measurements, ideal for general-purpose use.</p>	 
Demonstration video	References
<ul style="list-style-type: none">• https://www.youtube.com/watch?v=_kS Q6slApro• https://www.youtube.com/watch?v=aqA YYx8GUzQ	<ul style="list-style-type: none">• https://en.wikipedia.org/wiki/Beaker_(laboratory_equipment)• https://www.fishersci.co.uk/gb/en/browse/90094007/beakers• https://www.vedantu.com/evs/beaker

2.3 VOLUMETRIC FLASK


<p>Description: Pear-shaped with a long neck and a precise volume mark.</p> <p>Common Uses: Preparation of standard solutions, Preparation of series dilutions, Filling, measuring, decanting precise volumes of liquid, Calibrating other containers and devices.</p> <p>Variants: Available in capacities from 1 mL to 4 L</p> <p>Materials: glass (borosilicate or soda lime) or autoclavable and chemical-resistant plastics.</p> <p>Closure Options: glass or plastic stopper.</p> <p>Handle with Care: Intended for specific measurement accuracy; read the volume at eye level.</p>	
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Demonstration video	References
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=hrvXuX0Ow3s 	<ul style="list-style-type: none"> • https://www.fishersci.co.uk/gb/en/browse/90111072/volumetric-flasks?page=1 • https://www.foxxlifesciences.com/products/5647029a?variant=13875639550015 • https://brocott.co.uk/volumetric-flask-measuring-flask-graduated-flask-grade-a-25ml/

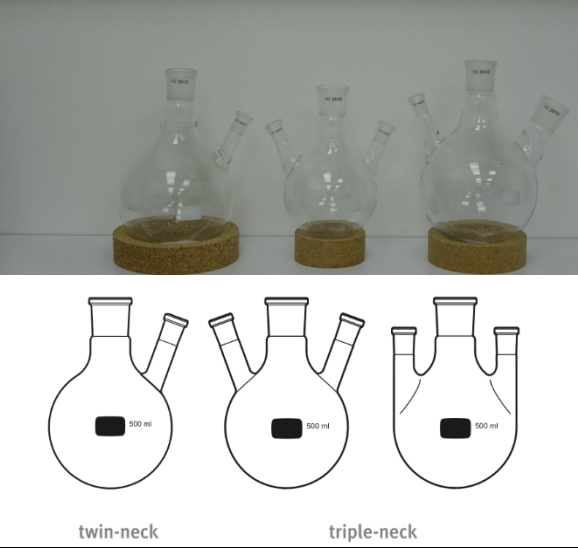
2.4 GRADUATED CYLINDER

<p>Description: Tall, graduated cylinder with a spout for pouring.</p> <p>Common Uses: Accurate volume measurements in milliliters or liters.</p> <p>Variants: commonly range in size from 5 mL to 500 mL, as well as different shapes: traditional graduated cylinder (A) and mixing cylinders (B)</p> <p>Materials: Glass or plastic.</p> <p>Handle with Care: Designed for precise measurements; read the volume at eye level.</p>	
Demonstration video	References
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=ca9BWdm29K8 	<ul style="list-style-type: none"> • https://en.wikipedia.org/wiki/Graduated_cylinder • https://www.rdworldonline.com/what-are-graduated-cylinders/


2.5 ROUND BOTTOM FLASK

<p>Description: Spherical or bulbous shape with a round bottom.</p> <p>Common Uses: Heating and distillation.</p> <p>Variants: Available in different sizes.</p> <p>Materials: Glass.</p> <p>Caution: Avoid sudden temperature changes to prevent breakage.</p>	
<p style="text-align: center;">Demonstration video</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=fHEk2WFgmXQ 	<p style="text-align: center;">References</p> <ul style="list-style-type: none"> • https://uk.vwr.com/store/category/round-bottom-flasks/557255

2.6 TWO NECKED FLASK


<p>Description: Spherical or bulbous shape with a round bottom and multiple necks.</p> <p>Common Uses: Heating and distillation.</p> <p>Variants: Available in different sizes and with different amounts and sizes of necks.</p> <p>Materials: Glass.</p> <p>Caution: Avoid sudden temperature changes to prevent breakage.</p>	
<p style="text-align: center;">Demonstration video</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=k3s2CjRN31s 	<p style="text-align: center;">References</p> <ul style="list-style-type: none"> • http://www.canfortlab.com/Two-Neck-Round-Bottom-Flask-p546.html • https://en.m.wikipedia.org/wiki/File:Round_bottom_flasks_en_2.svg

2.7 FILTERING FLASK (BÜCHNER FLASK)


<p>Description: Flask with a conical shape with a flat bottom, tapered neck, and sidearm for applying vacuum.</p> <p>Common Uses: Filtration processes.</p> <p>Materials: Glass.</p>	
<p style="text-align: center;">Demonstration video</p>	<p style="text-align: center;">References</p>

<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=rTtkcQGyYZ4 	<ul style="list-style-type: none"> • https://www.fishersci.co.uk/gb/en/brows e/90111074/filtering-flasks
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2.8 FLAT BOTTOM FLASK(FLORENCE FLASK)


<p>Description: Flask with a flat bottom and a narrow neck.</p> <p>Common Uses: In distillation, boiling, and other heating applications that require a stable base</p> <p>Variants: Different sizes available.</p> <p>Materials: Glass.</p>	
<p>Demonstration video</p>	<p>References</p>
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=GdNpvDJnjjU 	<ul style="list-style-type: none"> • https://medilabexports.com/product/flask-flat-bottom/#:~:text=Flat%2Dbottom%20flasks%20are%20commonly,a%20condenser%20for%20distillation%20processes.

2.9 SEPARATORY FUNNEL


<p>Description: Funnel-shaped glassware with a stopcock on the bottom and a stopper on top</p> <p>Common Uses: Extractions and separating liquid layers.</p> <p>Variants: Different sizes available.</p> <p>Materials: Glass.</p>	
<p>Demonstration video</p>	<p>References</p>
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=L13QUwqKwIU 	<ul style="list-style-type: none"> • https://www.fishersci.co.uk/gb/en/brows e/90094210/separatory-funnels?page=1

3 LAB BOTTLES

3.1 CLEAR REAGENT BOTTLES


Photos of the equipment present in the ELIBIO laboratory	
	
Description	Common Uses
Transparent bottle for storing liquid and powder reagents	Safe storage of chemicals
Variants	Materials
Different sizes available	Glass or plastic
Demonstration video	References
	<ul style="list-style-type: none"> • https://www.originltd.com/useful-resources/glass-packaging/reagent-bottle/#:~:text=Common%20uses%20for%20reagent%20bottles,du%20to%20anti%2Dcorrosion%20capabilities.

3.2 AMBER REAGENT BOTTLE


Photos of the equipment present in the ELIBIO laboratory	
	
Description	Common Uses
Brown-colored bottle to protect light-sensitive reagents	Storage of light-sensitive chemicals
Variants	Materials
Different sizes available	Glass or plastic
Demonstration video	References
	<ul style="list-style-type: none"> • https://www.originltd.com/useful-resources/glass-packaging/reagent-bottle/#:~:text=Common%20uses%20fo

	r%20reagent%20bottles, due%20to%20a nti%2Dcorrosion%20capabilities.
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3.3 LABORATORY DISPENSING BOTTLE

Photos of the equipment present in the ELIBIO laboratory	
	
Description	Common Uses
Squeeze bottle with a nozzle for dispensing distilled water or other solvents	Rinsing and other washing procedures
Variants	Materials
Different sizes available	Plastic
Demonstration video	References
<ul style="list-style-type: none"> https://www.youtube.com/watch?v=z-2wxQsQCVA 	<ul style="list-style-type: none"> https://en.wikipedia.org/wiki/Wash_bottle#:~:text=A%20wash%20bottle%20is%20a,tubes%20and%20round%20bottom%20flasks.&text=To%20clean%20laboratory%20glassware%20and,that%20needs%20to%20be%20cleaned.

3.4 ROUX CULTURE BOTTLE

Photos of the equipment present in the ELIBIO laboratory	
	
Description	Common Uses
Specialized bottle designed for cultivation of microorganisms and tissue cells	Bacterial and cell culture
Variants	Materials
Different sizes available	Glass
Demonstration video	References

	<ul style="list-style-type: none">• https://academic-accelerator.com/encyclopedia/roux-culture-bottle
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4 ELECTRIC EQUIPMENT

4.1 WATER PURIFYING MACHINE

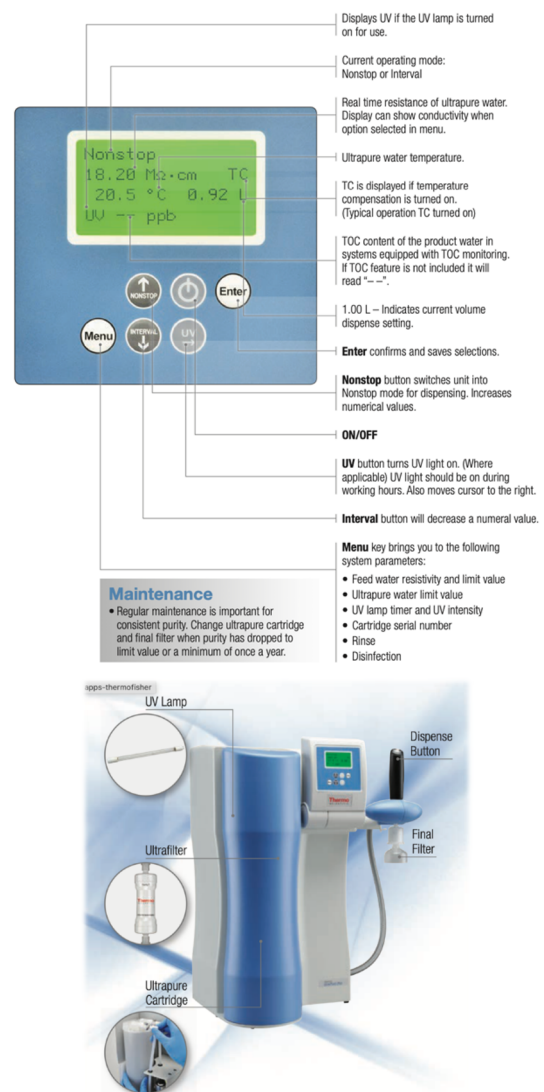
The Barnstead™ GenPure™ Pro Water Purification System can dispense ultra-pure water at 18.2 megohm-cm. It offers dispensable volumes of 0.01-65 liters with an accuracy of <0.5%.

Photos of the equipment present in the ELIBIO laboratory



Operations

1. Nonstop Mode:
 - b) Operates continuously during working hours for high-purity water.
 - c) Pump and UV run continuously.
1. Volumetric Dispense (Nonstop only):
 - d) Press Enter or Dispense button to view/adjust volume.
 - e) Press again to dispense water.
 - f) Press again to stop dispensing.
1. Manual Dispense:
 - g) Press dispense button twice to start and stop.
 - h) Adjust volume for larger dispenses.
1. Interval Mode:
 - i) Standby mode, initiated on start-up and after periods of non-use.
 - j) Pump recirculates water for 5 minutes every 30 minutes.
 - k) Nights and Weekends: System auto-switches to interval mode.
 - l) Manually enter Interval mode by pressing On/Off button twice.
1. Rinse:
 - m) Activate manually after long periods of inactivity.
 - n) Press menu, select "Rinse," then press Enter for a 30-second rinse.
1. Interval Rinse:
 - o) 0.5-second rinse during mode switches or interval recirculation.



Demonstration video

References

	<ul style="list-style-type: none"> • https://www.thermofisher.com/order/catalog/product/50131948 • https://www.thermofisher.com/document-connect/document-connect.html?url=https://assets.thermofisher.com/TFS-Assets%2FLED%2Fbrochures%2FThermo%20Scientific%20Barnstead%20GenPure_Brochure_En.pdf • https://www.thermofisher.com/document-connect/document-connect.html?url=https://assets.thermofisher.com/TFS-Assets%2FLED%2Fbrochures%2FGenPure-Pro-Consumables-BRWPOGGENPRO-EN.pdf
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4.2 CENTRIFUGE

The Hermle centrifuge has been crafted for the purpose of separating materials or mixtures with different densities. It is specifically tailored for the preparation and processing of samples derived from the human body, within the framework of in-vitro diagnostic applications. Its design is intended to facilitate the utilization of in-vitro diagnostics in accordance with its designated purpose.



<ol style="list-style-type: none"> 1 central adjuster: Run Parameters 2 0-I: Power Switch 3 LCD: Control Panel Display 4 rpm/rcf: Speed/ g-force 5 accel/decel: Acceleration / Deceleration Intensity 6 time: Centrifugation Time 7 lid: Lid Release 8 quick: Short Running 9 start: Start Centrifugation 10 stop: Stop Centrifugation 11 prog: Retrieving Stored Programs 12 store: Program Store 13 temp: Temperature Indication 	
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LCD-Display

Display Fields:

A-1 Display Field - "rpm/rf"

A-2 Display Field - "acc/dec"

A-3 Display Field - "time"

A-4 Display Field - "temp"

Messages/Logos of the Display

Fields:

M1 "close" M8 "decel"

M2 "open" M9 "radius"

M3 "rotor" M10 "program"

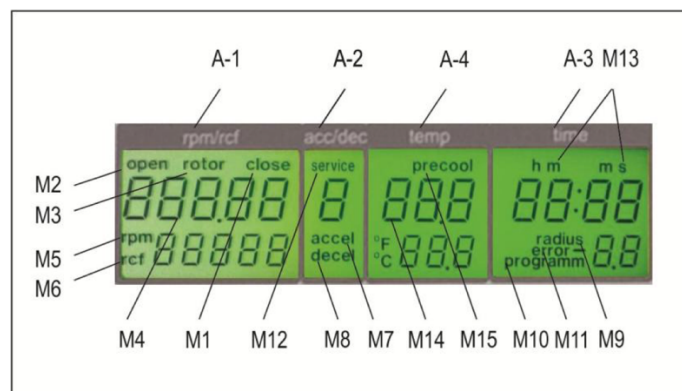
M4 Rotor-No. M11 "error"

M5 "rpm" M12 "service"

M6 "rcf" M13 h m s

M7 "accel" M14 "temperature"

M15 "precool"



Demonstration video



- <https://www.youtube.com/watch?v=NqVaMiTI8Uw>
- <https://www.youtube.com/watch?v=SpauwfMpTLc>

References

- <https://labfriendcoredataprod.blob.core.windows.net/labfriendcore-data-prod/files/Hermle%20Z216MK%20Microlitre%20Centrifuge%20Instruction%20Manual.pdf>



4.3 VORTEX

The Corning® LSE™ Vortex Mixer serves as a versatile laboratory vortex mixer. Its mixing speed can be adjusted up to 3,000 rpm. With a three-position switch, the mixer can be used continuously or activated by "touch." The robust metal base and rubber feet ensure that the unit remains stable on the bench, preventing any movement even at maximum speed.

Photos of the equipment present in the ELIBIO laboratory	
	
Demonstration video	References
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=UjddrMF1myc 	<ul style="list-style-type: none"> • https://www.corning.com/catalog/cls/documents/equipment-manuals/Manual_Vortex_Mixer.pdf



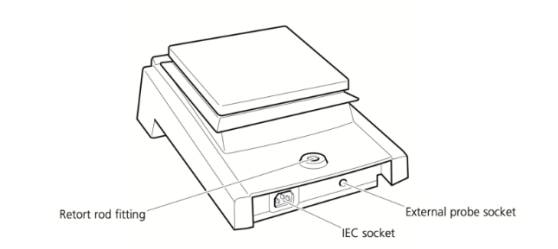
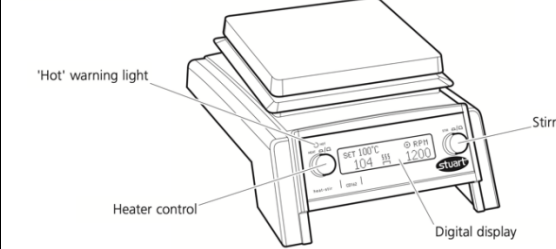
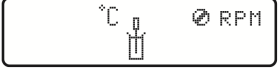
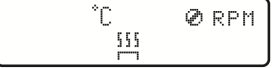
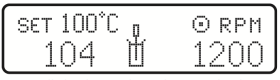
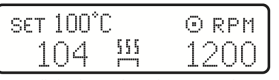
4.4 MAGNETIC STIRRER

The VWR® Magnetic Stirrer Lab Disc is an exceptionally flat and compact magnetic stirrer with no moving parts. It alternates the direction of rotation every 30 seconds to guarantee optimal mixing.

Photos of the equipment present in the ELIBIO laboratory	
	
Demonstration video	References
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=NeDgBuNoOAg 	<ul style="list-style-type: none"> • https://media.vwr.com/ecatalog/index.html?catalog=EU_HSG_Stirring_Shaking_2018/EN&shop=uk#page_2

4.5 HEATING PLATE/MAGNETIC STIRRER

The advanced stirrer hotplate offers precise temperature and stirring speed regulation for research and lab applications. Key features include a max temperature of 450°C. The stirrer operates at speeds from 200-1300 rpm with a capacity of 15 liters. Safety features include a flashing "Hot" light, independent circuit against overheating, and glass ceramic top plate for chemical resistance and fast heat-up. The device allows unsupervised use with a 20°C safety cutoff.

Photos of the equipment present in the ELIBIO laboratory	
	
Control and buttons	
	
Digital Display	
 °C RPM [Probe Icon]	 °C RPM [Blank Space]
Display at switch on, heater & stirrer off, probe attached.	Display at switch on, heater & stirrer off, probe removed.
 SET 100°C RPM 104 [Probe Icon] 1200	 SET 100°C RPM 104 [Blank Space] 1200
Full display with probe attached.	Full display with probe removed.
Demonstration video	References
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=mittVGSeVIY 	<ul style="list-style-type: none"> • https://www.akribis.co.uk/stuart-hotplate-stirrer-digital-cd162 • http://www.keison.co.uk/products/stuart/SD160CD162SD162Manual.pdf

4.6 AUTOCLAVE

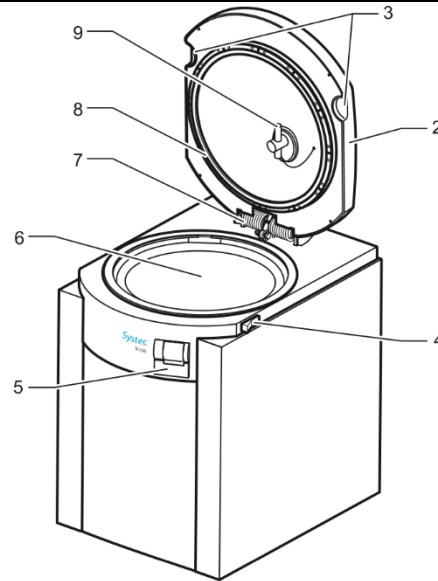
The Systec VX/VE Series autoclaves are designed for laboratory use, specifically for sterilization of Glassware, Liquids and biological waste. It uses either steam or a steam-air mixtures for the sterilization. The VX Series features innovative design characteristics that simplify, enhance safety, and improve precision in process procedures.

Photos of the equipment present in the ELIBIO laboratory



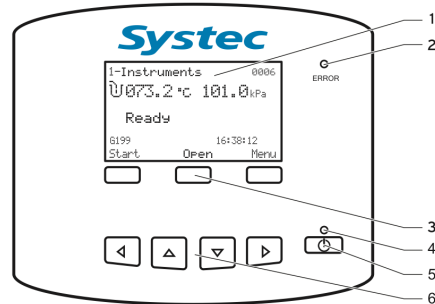
Control elements on the front of the appliance

- 1 Control panel
- 2 Door
- 3 Grip handles
- 4 Main switch
- 5 Printer (optional)
- 6 Autoclave chamber
- 7 Door hinge
- 8 Door seal
- 9 Flexible temperature sensor



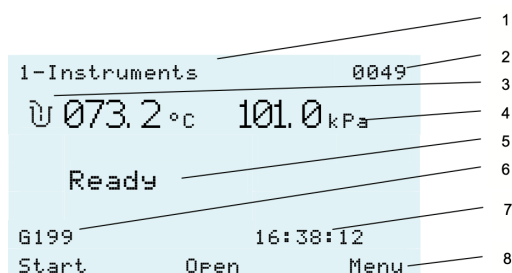
Control panel elements

- 1 Display
- 2 Error LED
- 3 Display keys: select the functions at the top of the display (e.g., Start)
- 4 Standby LED
- 5 "On/Off" key for switching the autoclave on and off.
- 6 Arrow keys: select menu items and set values.



Digital Display



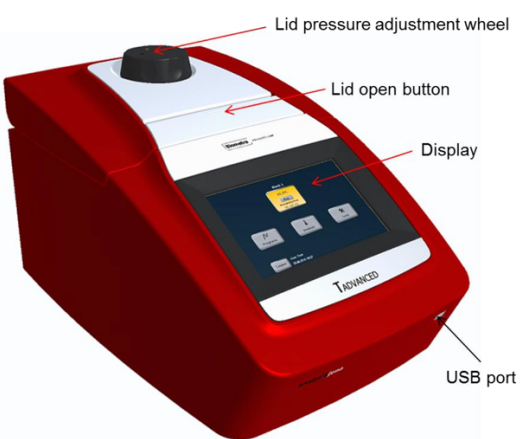
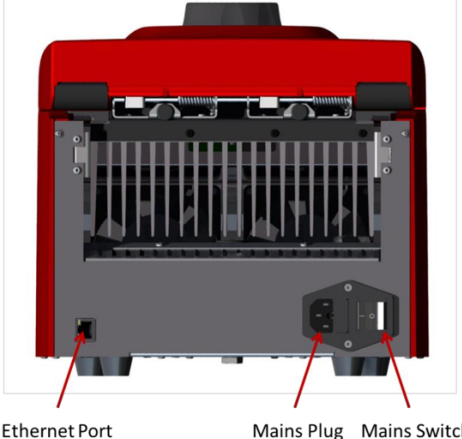
- 1 currently selected cycle number/name.
- 2 The cycle counter, which increases by "1" for every sterilization cycle.
- 3 A symbol representing the control sensor selected for the current cycle.
 - a) Flexible temperature sensor \cup
 - b) Sensor in the steam outlet (Only Ψ X series)
- 4 Current temperature (in °C) and current pressure (in kPa) in the appliance.



















5 Instructions, and possibly error messages and status information.	
Demonstration video	References
	<ul style="list-style-type: none"> • https://www.aria-ocean.com/Products/Autoclave/Files/Autoclave-serV/BA%20VX_VE%20Serie%201_3%20EN%20completely.pdf

4.7 PCR MACHINE

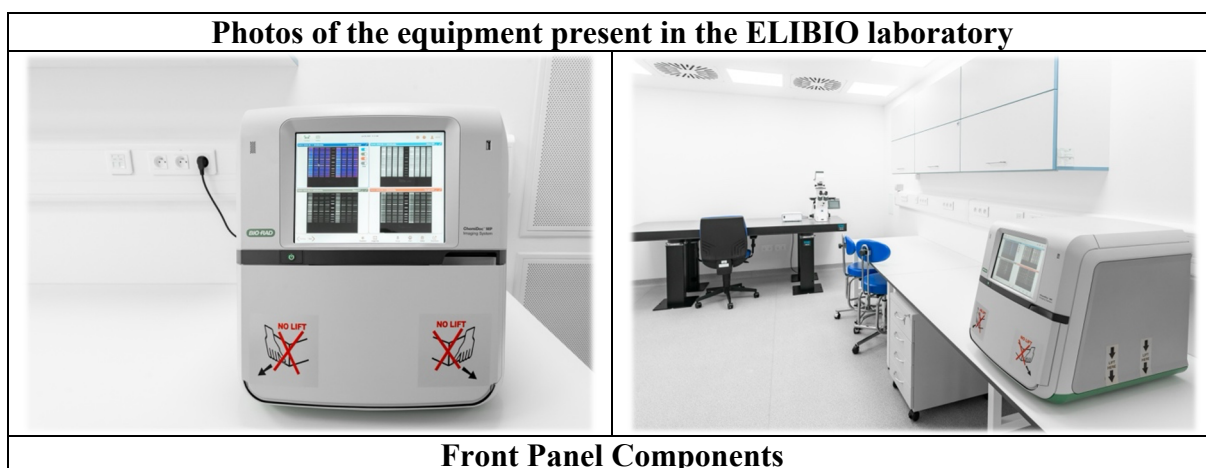
The Biometra TAdvanced Thermal Cycler was designed to amplify DNA by using the Polymerase Chain Reaction (PCR). It boasts a 7-inch color touchscreen, Quick Block Exchange for easy module swapping, and high ramp rates with aluminum blocks. A specialized 96-Well silver block, protected by gold plating, ensures maximum speed and temperature uniformity. The heated lid features High-Performance Smart Lid technology, enhancing temperature uniformity and preventing condensation. The Linear Gradient Tool allows for programmed temperature gradients. The PCR Control App enables network access for live monitoring, program management, and parameter reading via smartphones or tablets.

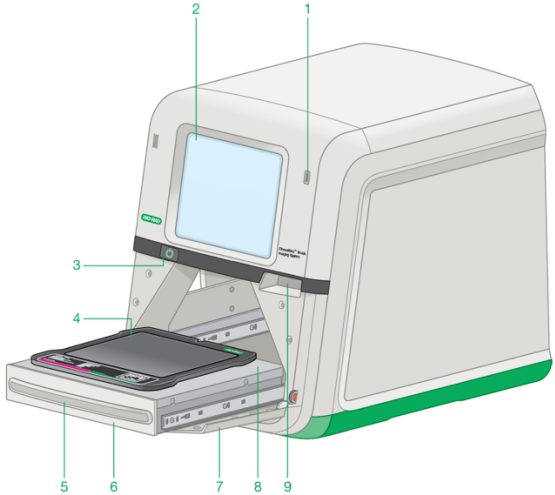
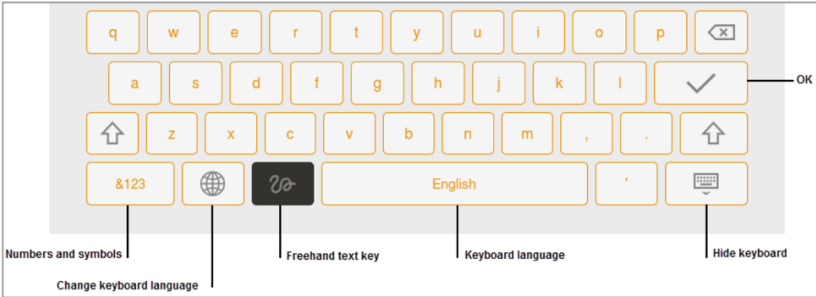
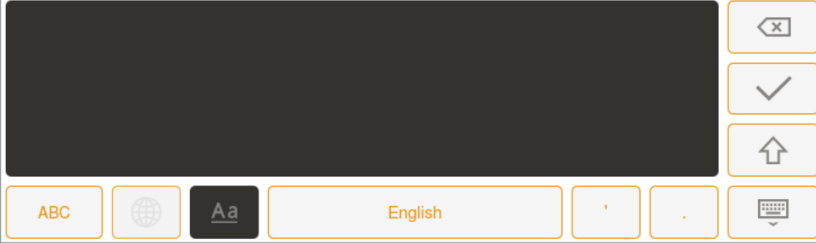
Photos of the equipment present in the ELIBIO laboratory	
	
Operating elements	
	
Keyboard	

Delete single character  Delete all characters  Back  Forward 	Delete single character  Delete all characters  Tab  Infinite 
Scroll up  Scroll down 	Scroll Left  Scroll Right 
Confirm  Cancel 	Home  Back 
Demonstration video	References
<ul style="list-style-type: none"> https://www.youtube.com/watch?v=JENXmDH4Kbg 	<ul style="list-style-type: none"> https://www.fishersci.com/shop/products/biometra-tadvanced-thermal-cylinders-13/p-7159717 https://www.labrepc.com/wp-content/uploads/2018/09/Biometra_TAdvanced_Instruction_Manual_142306598_5.pdf

4.8 IMAGING SYSTEM (GEL)

The ChemiDoc MP Imaging System is a comprehensive instrument designed for imaging and analyzing gels and western blots. It caters to multiplex fluorescent western blotting, chemiluminescence detection, general gel documentation, and stain-free technology imaging requirements.



<ol style="list-style-type: none"> 1 USB port 2 Touch screen 3 System on/off button 4 Sample tray 5 Transilluminator drawer handle 6 Transilluminator drawer 7 Front door (open position) 8 Imaging stage 9 Front door open handle 	
Keyboard	
	
	
Demonstration video	References
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=FT57iYbHqqs 	<ul style="list-style-type: none"> • https://www.bio-rad.com/webroot/web/pdf/lsr/literature/10000062126.pdf • https://www.bio-rad.com/de-de/product/chemidoc-mp-imaging-system?ID=NINJ8ZE8Z

4.9 ULTRASONIC BATH

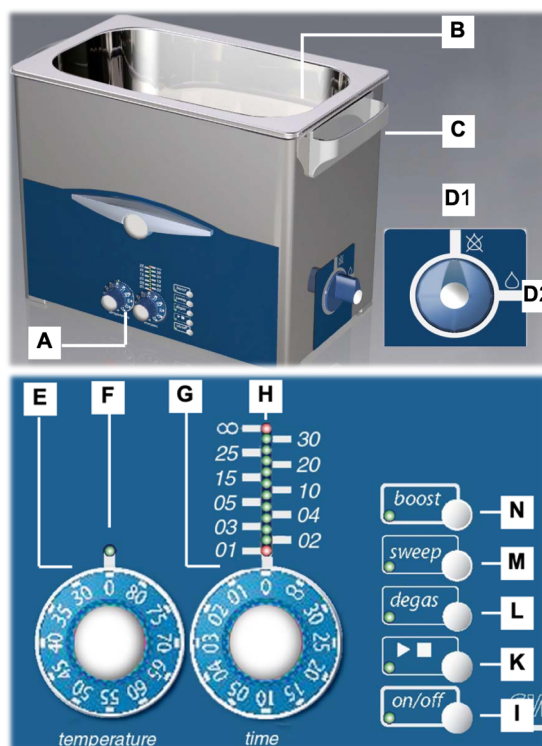
The Clifton SW3H ultrasonic baths are engineered for cleaning delicate or fragile components vulnerable to damage during mechanical cleaning. It is also used for dissolving, digesting, dispensing, emulsifying, homogenizing, deagglomerating and mixing. Its design allows continuous operation and the LED control panel displays both set and actual values. The temperature can be precisely set between 30°C and 80°C (in 5°C increments). The timer offers flexibility, allowing operation between 1-30 minutes or up to 8 hours, with auto switch-off after 12 hours on larger models to prevent unintended operation if no keys have been activated.

Photos of the equipment present in the ELIBIO laboratory



Unit description

- A. Operating panel for controlling the unit functions
- B. Transducer tank
- C. Plastic carrying handles for the safe transportation of the unit
- D. Turning drain dial allows liquid emptying from the tank.
Indicators show position when drain is shut and open
- E. Temperature
- F. LED indicator temperature red during heating up, green when set temperature is reached or exceeded
- G. Time. Settings: 1-30 min.; permanent ∞
- H. LED indicator for remaining time
- I. on/off key for switching the unit on and off
- K. Press "Play and Stop"
- L. Press "Degas" for efficient degassing of the cleaning liquid
- M. Press "Sweep" for perfect sound field distribution
- N. Press "Boost" function for additional 25 % ultrasonic power



Demonstration video

- <https://www.youtube.com/watch?v=ydrCPTU2atU>


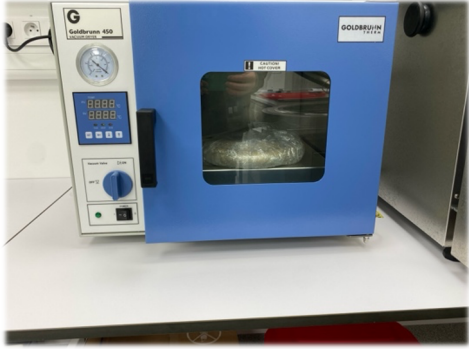


References

- https://www.wolflabs.co.uk/document/Nickel-Electro_water-baths-sonicating_SW_manual.pdf
- <https://www.camlab.co.uk/clifton-sw3h-3-litre-heated-and-timed-ultrasonic-bath-230v>

4.10 VACUUM OVEN



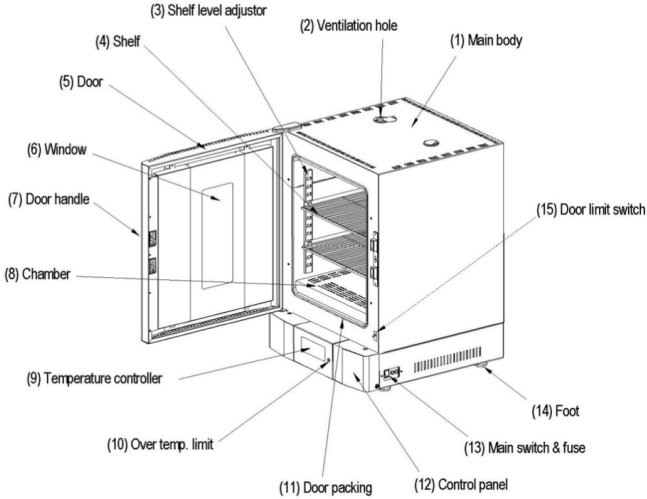
The Goldbrunn 450 Vacuum Dryer achieves a Swift and effective oven condensation-free drying through a 133 Pa pressure system. Operating efficiently with a 50-liter interior volume

and two aluminum inserts. Accurate temperature control (0.9 °C) facilitated by a PID controller and digital LED display with backlighting. Reduced drying times are ensured through optimal temperature distribution on all levels and heating via a resistance oven. Enhanced safety features include overheat protection, while the double-glazed door design safeguards against implosion and heat.

Photos of the equipment present in the ELIBIO laboratory	
	
DEVICE DESCRIPTIONS	
<ol style="list-style-type: none"> 1. door handle 2. inspection window 3. vacuum gauge 4. control panel 5. inlet valve 6. vacuum valve / 7. ON/OFF switch 8. indicator light 9. vacuum pump connection 10. temperature safety switch 	
Control panel	
<ol style="list-style-type: none"> 1. measured value display 2. preset value display 3. indicators: <ol style="list-style-type: none"> a. RUN – operation indicator b. HEAT – heating indicator c. ALM – alarm indicator 4. SET function key 5. SHIFT key 6. setting down button („-“) 7. setting up button („+“) 	
Demonstration video	References
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=y661hEL0x1k 	<ul style="list-style-type: none"> • https://www.expondo.co.uk/goldbrunn-vacuum-drying-oven-1-450-watts-10070013 • https://www.manualslib.com/manual/2105941/Goldbrunn-Therm-Goldbrunn-450.html?page=19#manual

4.11 OVEN



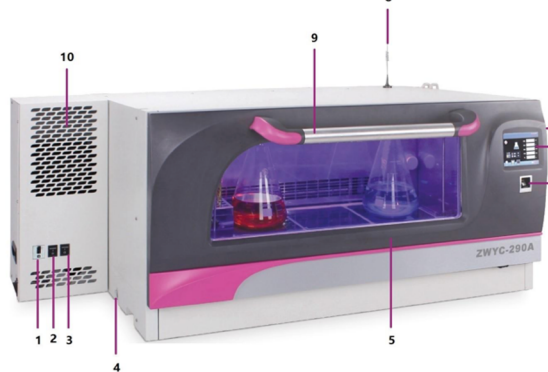
The Jeio Tech ON-02G, 52 Litre General Natural Convection Oven is specifically crafted for laboratory applications that demand a gentle airflow. Ideal for sterilization, drying, and high-temperature storage tasks in the laboratory, it is well-suited for applications where strong airflow is not suitable, such as with powders and foils, and where high drying performance or specific time requirements are not essential.

Photos of the equipment present in the ELIBIO laboratory	
	
Name of each Part	
<p>(1) Main body: Constructed from iron plate and painted.</p> <p>(2) Ventilating hole: Adjusts air volume for ventilation.</p> <p>(3) Shelf level adjustor: Easily adjusts shelf level based on sample size.</p> <p>(4) Shelf: Made of stainless-steel wire.</p> <p>(5) Door: Includes an air barrier and</p> <p>(6) Window: observing glass with triple glass layers.</p> <p>(7) Door Handle: Used for door opening.</p> <p>(8) Chamber: Made of stainless steel, houses blower, heater, temp. sensor, and temp. regulator.</p> <p>(9) Temperature Controller: Equipped with a microprocessor (CPU).</p> <p>(10) Over temp. Limit: Cuts off power if heater temperature exceeds the set temperature.</p> <p>(11) Door sealing: Siliconerubber for high temperature, ensuring high air sealing.</p> <p>(12) Control panel: Houses controller and electric components.</p>	

<p>(13) Main switch & Fuse: Main power switch, fuse protects from electric shock.</p> <p>(14) Foot: Adjusts the level of the instrument.</p> <p>(15) Door limit switch: Cuts off power and activates an alarm if the door is open for an extended period, ensuring safety.</p>	
<p>Demonstration video</p>	<p>References</p>
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=YzJUjI92moU 	<ul style="list-style-type: none"> • https://www.medlinescientific.co.uk/product/jeio-tech-on-02g-52-litre-general-natural-convection-oven/ • https://www.nist.gov/system/files/documents/nr/Oven_JeioTech_ON-02G.pdf

4.12 INCUBATOR

The ZWYC-290A is designed for efficient use of space, allowing stacking of 2-3 units for multiplied incubation capacity on a single footprint. The stacking feature is easily managed even after setup. Each compartment operates independently with cooling, a TFT touch screen control panel, intelligent temperature and shaking speed control with "ramp and soak" programs, and standard safety features. It can be upgraded with modular options, including active humidity control and CO2 concentration controls. This equipment is specifically tailored for research experiments in microbiology, pharmacy, and agriculture, widely applied in activities such as cell culturing, hybridization, cell aeration, and solubility studies.

<p>Photos of the equipment present in the ELIBIO laboratory</p>	
	
<p>Structure</p>	
<ol style="list-style-type: none"> 1 Main Trip Switch 2 Illumination Light Switch 3 UV Light Switch 4 Drain Outlet 5 Door 6 Finger Printer Sensor (Option) 7 Control Panel 8 WiseKonec Plus™ Antenna (Option) 9 Door Handle 10 Ventilation Holes 11 USB Interface 	
<p>Display</p>	



"Stop" button:

Press this to stop the operation.

"Run" button:

Press this button to start the operation.

"Set" Button:

Press it to enter the Set Menu.

"Clock Time" Display:

It displays the actual clock time.

"Alarm" Status:

Once the conditions of alarms are fulfilled, the alarm is declared.

"Door" Status:

This indicator will be lighted if door is opened or closed improperly.

"Address" Status:

This indicates the current serial address when the incubator is connected to any communication protocols.

"Door Lock" Button:

Press it to enter the password and unlock the front door.

"Shaking Flask" Status:

The illustration of "flask" indicates the status of the unit.

Photosynthetic Lighting Switch:

Press it to enable or disable the photosynthetic LED lighting function.

Red Light Indicator:

The indicator lit when the red light is on.

Blue Light Indicator:

The indicator lit when the blue light is on.

"Control Mode" Status:

This box indicates the status of the current control mode.

"Speed" Display:

It displays the current operating speed in rpm.

"Temperature" Display:

It displays the current operating temperature in °C.


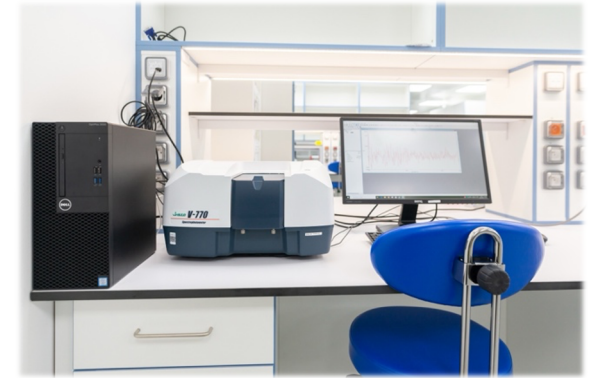
"Humidity" Display:



<p>It displays the current operating relative humidity in RH%.</p> <p>"Time" Display: It displays current accumulative running time in minutes.</p> <p>"CO2" Display: It displays the current operating CO₂ concentration in %.</p>	<p>SPEED</p> <p>TEMP</p> <p>HUMI</p> <p>TIME</p> <p>CO₂</p>
Demonstration video	References
https://www.youtube.com/watch?v=6s0PEkMD644	<ul style="list-style-type: none"> https://www.laboratorium-apparatuur.nl/amfile/file/download/file/59565/product/3986/

4.13 V-770 UV/VIS/NIR SPECTROPHOTOMETER


UV/VIS/NIR spectrophotometers is a machine that uses light to investigate properties of (liquid) materials. Using a cuvette (plastic or glass) filled with the liquid of interest, it can be placed in the compartment, and light will pass through. The light that is absorbed by the liquid obeys the Lambert-Beer law: $A = \epsilon \ell c$, where A is the absorbance, ϵ is the molar attenuation coefficient (or extinction coefficient), ℓ is the optical path length (the thickness of the cuvette) and c is the concentration of the liquid of interest. Libraries in the scientific literature can help connecting the peaks and the valley of the output spectrum with the material properties.

Photos of the equipment present in the ELIBIO laboratory	
	
Information on the model	
<p>Wavelength range: 190 nm to 2700 nm</p> <p>Wavelength accuracy at 656.1 nm: +/-0.3 nm</p> <p>Wavelength accuracy 1312.2 nm: +/-1.5 nm</p> <p>Wavelength repeatability: +/-0.1 nm</p> <p>Spectral bandwidth (SBW): refer to manual</p> <p>Photometric range UV-VIS: -4~4 Abs</p> <p>Photometric range NIR: -3~3 Abs</p> <p>Scanning speed: 10-8000 nm/min</p> <p>Baseline flatness: +/-0.0005 Abs (200 - 1000 nm)</p> <p>Gratings switch over: 800 nm to 900 nm</p> <p>Light source: Halogen lamp and Deuterim lamp</p> <p>Detector: Silicon photodiode</p>	

Demonstration video	References
<ul style="list-style-type: none"> https://jascoinc.com/training-video/video-category/spectra-manager-for-uv-visible/ 	<ul style="list-style-type: none"> https://jascoinc.com/products/spectroscopy/molecular-spectroscopy-software/

4.14 FLUORESCENCE AND ABSORBANCE SPECTROMETER

A fluorescence and absorbance spectrometer combines the spectrophotometer of the previous section with fluorescence measurements. In this way, the information on the material includes also the emission (fluorescence) light from the material itself. Duetta™ is a 3-in-1 spectrofluorometer that combines the functions of fluorescence, transmission and absorbance spectrometers simultaneously.

Photos of the equipment present in the ELIBIO laboratory	
	
Information on the model	
<p>Fluorescence Sensitivity: Water Raman SNR >6,000:1 RMS, 350 nm excitation, 5 nm slits Spectral Acquisition Rate: 510,000 nm/min EEM Acquisition Rate: 1 s + A-TEEM Acquisition Rate: As fast as 30 seconds (sample and wavelength dependent) Fluorescence Detector: CCD/Spectrograph Fluorescence Detector Range: 250 to 1,100 nm Fluorescence Bandwidth: 1, 2, 3, 5,10, 20 nm (excitation and emission) Light Source: 75 W Xenon arc lamp. Dedicated cartridge for snap-in replacement Excitation/Absorbance Wavelength Range: 250 to 1,000 nm Absorbance Detector: Silicon Photodiode Absorbance Detector Range: 250 to 1,000 nm Absorbance Range: 0 to 2 A Absorbance Accuracy: +/- 0.02 A Wavelength Accuracy: +/- 1 nm</p>	
Demonstration video	References
https://www.horiba.com/int/scientific/products/fluorescence-spectrometers/duetta-education-labs/	<ul style="list-style-type: none"> https://www.horiba.com/int/scientific/products/detail/action/show/Product/duetta-1621/

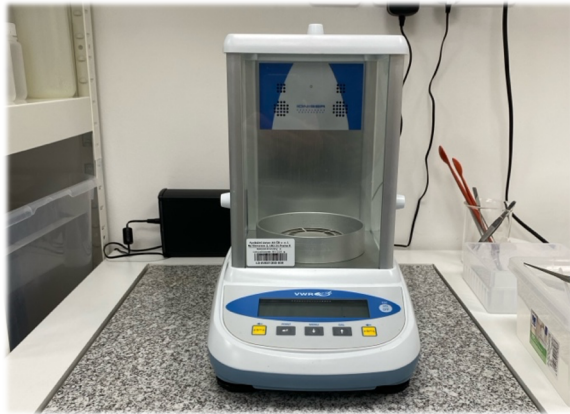
- https://static.horiba.com/fileadmin/Horiba/Products/Scientific/Molecular_and_Microanalysis/Duetta/Duetta_brochure.pdf

4.15 SCALES

A selection of eight high-level balances, incorporating cutting-edge weighing technology, ensures highly accurate results with fast stabilization times. These balances feature a wear-resistant LED touch screen for basic applications in laboratory, industrial, and educational settings.

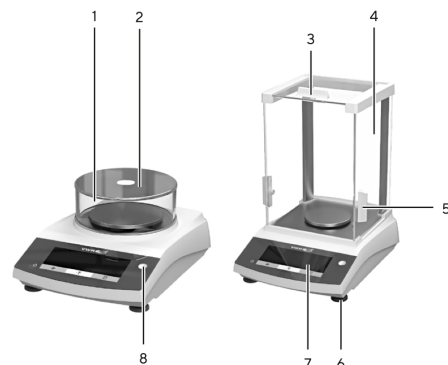
Moreover, they offer easy cleaning with high chemical resistance and include a control panel with high resolution, touch screen functionality, and eight language options. The balances provide overload protection, ensuring the durability of the equipment.

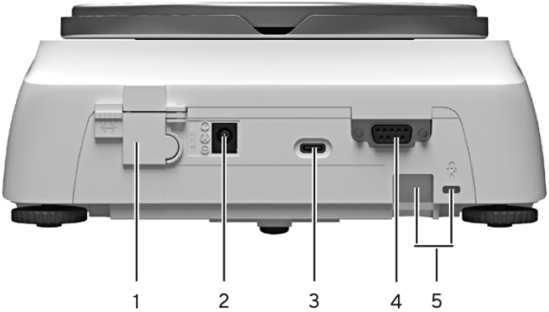
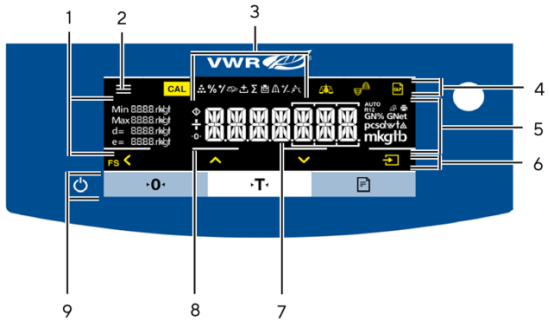
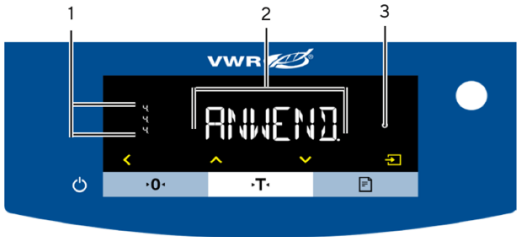
Photos of the equipment present in the ELIBIO laboratory



Device Overview

- 1 Round draft shield
- 2 Cover of the round draft shield
- 3 Upper draft shield:
Used to manually open the panel upper panel
- 4 Analytical draft shield
- 5 Side draft shield:
Used to manually open the panel side panel
- 6 Leveling foot:
Used to level the balance, manually adjustable.
- 7 Control module
- 8 Level



Device Connections	
<ol style="list-style-type: none"> 1 Access switch: Protects the device from changes to the device settings. Is 2 Power supply: Connection for power supply to the device 3 USB-C: For connection to a printer or PC 4 RS232 9-pin: for connection to a printer or PC 5 Slot For attaching an anti-theft device or a Kensington lock 	
Operating Display in Weighing mode	
<ol style="list-style-type: none"> 1 Metrological data 2 Menu 3 Application overview: Displays the selected application program during operation. 4 Toolbar 5 Weighing unit: Displays the selected unit, e.g. grams 6 Navigation bar: For navigation in the menu and system settings 7 Measurement display 8 Visual touch feedback 9 Toolbar 	
Menu System Setting Display	
<ol style="list-style-type: none"> 1 Menu or parameter entry 2 [Selection] display 3 Menu level: Shows the position of the displayed menu or parameter in up to 4 levels 	
Video demonstration	References
<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=Iw4dqBu9XeE 	<ul style="list-style-type: none"> • https://uk.vwr.com/store/product/33771486/vwr-premium-analytical-balances • https://uk.vwr.com/assetsvc/asset/en_GB/id/36474769/contents/vwr-premium-balance-analytic-pba-and-precision-pbp.pdf