

USER MANUAL

Rotary evaporator

RV-5A

Distributor

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Product identification

This user manual applies to **the RV-5A** rotary evaporator and is valid for all versions of the instrument, unless otherwise specified.

Warning

The safety information contained in this manual is essential to prevent personal injury, damage to the instrument, malfunction or non-compliant results resulting from failure to follow the instructions. It is essential to read the entire manual carefully and familiarise yourself with the instrument before using it. The manual should be kept near the instrument so that the operator can easily consult it when necessary. Safety warnings are expressed using warning terms or symbols.

Document storage

This manual must be kept for the entire useful life of the instrument and made available to all authorised operators.

Rights and responsibilities

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1. General information

1.1 Purpose of this document

This user manual describes the features, operation, installation and use **of the RV-5A rotary evaporator**.

The manual is intended for operators, laboratory managers and technical personnel responsible for the installation, use and routine maintenance of the instrument.

The manual should be **read carefully before commissioning** the instrument and kept for future reference. It is an integral part of the product.

1.2 Identification of the instrument

The product described in this manual is a **laboratory rotary evaporator**, identified as:

- **Trade name:** RV-5A
- **Type:** Bench-top rotary evaporator
- **Field of use:** Chemical, pharmaceutical, university and research laboratories

The instrument is uniquely identified by the **identification plate** affixed to the body of the instrument, which shows the main data (model, power supply, serial number).

1.3 Model versions

The RV-5A rotary evaporator is available in the following versions:

- **Version with motorised lifting**

The basic operating functions are identical for both versions; the differences concern only the height adjustment system of the motor/glassware unit.
The sections of the manual describing specific functions clearly indicate which version they refer to.

1.4 Intended use

The RV-5A rotary evaporator is designed for the **evaporation, distillation and concentration of solvents** under reduced pressure in a laboratory environment.

The instrument is intended, in particular, for:

- distillation of volatile solvents
- concentration of solutions

- solvent recovery
- preparation of samples for subsequent analysis

It is intended **for indoor** use **only** and by trained and qualified personnel.

1.5 Reasonably foreseeable misuse

Any use other than that described in the 'Intended use' section is considered **improper use**.

In particular, it is not permitted to:

- use the instrument in environments at risk of explosion
- using solvents or substances that are not compatible with glassware or seals
- using the instrument without adequate training
- modify the instrument or its components
- use the instrument for continuous industrial or production purposes

Improper use may cause damage to the instrument, pose a risk to the operator's safety and invalidate the warranty.

1.6 Operator responsibility

The operator is responsible for:

- reading and understanding this manual before use
- using the instrument in compliance with current safety regulations
- checking the integrity of the instrument and glassware before each use
- using appropriate personal protective equipment (PPE)
- ensuring that the instrument is used exclusively for its intended applications

The manufacturer and distributor are not liable for damage to persons or property resulting from improper, non-compliant or unauthorised use of the instrument.

2. Principle of operation

2.1 Principle of rotary evaporation

The RV-5A rotary evaporator operates on the principle of **vacuum distillation with flask rotation**.

Reducing the pressure inside the system **lowers the boiling point of solvents**, allowing evaporation at temperatures lower than atmospheric pressure. This allows for gentle sample treatment, reducing the risk of thermal degradation.

2.2 Role of rotation

During operation, the evaporation flask is set in **continuous rotation**.
Rotation has the following functions:

- increases the exchange surface area of the sample
- promotes the formation of a thin film on the flask wall
- improves heat transfer efficiency
- reduces the risk of violent boiling (bumping)

The rotation speed can be adjusted via the instrument control panel.

2.3 Role of heating

The evaporation flask is partially immersed in a **heating bath**, which provides the energy necessary for solvent evaporation.

The heating bath allows for:

- uniform heating of the sample
- precise temperature control
- stable control of process conditions

The type of fluid used in the bath (water or oil) and the set temperature must be chosen according to the solvent and the application.

2.4 Role of vacuum

Vacuum plays a fundamental role in the evaporation process. By reducing the pressure inside the system:

- the boiling point of the solvent is lowered
- the evaporation process is accelerated
- the sample's exposure to high temperatures is reduced

The vacuum is generated by an external vacuum pump (not included) connected to the condenser or glassware system.

2.5 Condensation and solvent recovery

The solvent vapours generated in the evaporation flask are conveyed to **the condenser**, where they are cooled by circulating refrigerant.

The condensed solvent flows by gravity into **the collection flask**, allowing the evaporated solvent to be recovered and preventing vapours from being dispersed into the working environment.

2.6 Interaction of process parameters

Evaporation efficiency depends on the correct combination of the following parameters:

- heating bath temperature
- rotation speed of the flask
- level of vacuum applied
- condenser cooling capacity

A correct balance of these factors allows for **rapid, efficient and controlled** evaporation, reducing operational risks and improving process reproducibility.

3. Safety

3.1 General safety warnings

The RV-5A rotary evaporator must **only** be used **by qualified and properly trained personnel**.

Before commissioning and using the instrument, the operator must:

- read this manual carefully
- be familiar with the safety regulations applicable to the laboratory
- assess the specific risks associated with the solvents and samples used

The instrument must **only** be used **if it is in perfect working order**. In the event of anomalies, visible damage or malfunctions, the instrument must be taken out of service.

It is forbidden to modify, tamper with or use the instrument in a manner that does not comply with the instructions in this manual.

3.2 Electrical hazards

The RV-5A rotary evaporator is electrically powered and presents **risks related to mains voltage**. To reduce the risk:

- connect the instrument only to **earthed** sockets
- check that the supply voltage and frequency correspond to the values indicated on the rating plate
- use only the power cables supplied or approved
- do not disconnect the power cables during operation
- do not use the instrument in damp environments

Any electrical maintenance must be carried out **only by authorised personnel**.
Before cleaning or maintenance, disconnect the instrument from the mains.

3.3 Thermal risks (heating bath)

During operation, the heating bath can reach **high temperatures**, resulting in **a risk of burns**.

To reduce thermal risks:

- avoid direct contact with the heating bath during and after operation
- do not move the heating bath when the fluid is hot
- use only suitable fluids (water or oil, according to specifications)
- do not use the heating bath without fluid (dry operation)

After switching off, the heating bath and evaporation flask may remain hot for a prolonged period. Wait for them to cool down before performing any work.

3.4 Mechanical risks (moving parts)

During operation, the evaporation flask and the rotation shaft are in motion.

To prevent injury:

- **do not touch moving parts** during operation
- do not wear loose clothing, jewellery or accessories that could get caught
- tie back long hair and wear appropriate laboratory clothing
- **stop rotation completely before working on the glassware**

Access to moving parts is **only** permitted **when the instrument is stopped and switched off**.

3.5 Risks associated with vacuum and glassware

The RV-5A rotary evaporator operates under vacuum and uses glass components, with risks of implosion and breakage.

To reduce these risks:

- use **only** glassware that is intact and free of defects
- **check** the glassware before each use
- do not apply sudden or excessive vacuum
- do not use the instrument under **overpressure**
- ensure that all connections are correctly tightened

In the event of glassware breakage, switch off the instrument immediately, interrupt the vacuum and wait for the system to return to safe conditions before taking any action.

3.6 Safety symbols on the instrument

Safety symbols may be present on the instrument and heating bath to indicate potential risks, including:

- **risk of burns** from hot surfaces
- **electrical hazard**
- general **safety** warnings

These symbols must always be clearly visible and legible. If they are damaged or become illegible, they must be replaced.

DANGER 	
  	**Risk of electric shock and risk of death** Do not wet the instrument's power cable during installation, commissioning or maintenance. Do not connect the instrument to the power supply if the rear panel is dented or damaged. ➢ If the power cord or rear panel of the instrument is damaged, stop using it immediately, unplug it from the power supply and contact your dealer for repairs. ➢ All work on the electrical components of the instrument must be carried out exclusively by qualified personnel.
	**Explosion hazard** ➢ Only install the instrument in areas where there is no risk of explosion. Do not keep air/solvent mixtures or explosive dusts in the vicinity. Never introduce materials into the instrument that are explosive or flammable at the selected operating temperature. Never introduce materials containing flammable or explosive solvents into the instrument. Never introduce materials into the instrument that, due to sublimation or pyrolysis, give rise to the formation of flammable materials at the selected operating temperature.
 	**Risk of poisoning and risk of death** Never introduce materials into the instrument whose disintegration could result in the formation of poisonous gases at the selected operating temperatures.

CAUTION 	
	**Risk of burns** ➢ The edge of the thermostatic bath becomes hot and must not be touched while the instrument is in operation.
	**Risk of injury and risk of breakage** ➢ Always place the instrument on surfaces that can support its weight.
	**Risk of tipping over and risk of injury** Do not use the tool on unsuitable, small or uneven surfaces.
  	**Risk of injury, risk of the tool slipping or tipping over, and risk of damage to the tool** ➢ The tool must be lifted by 2 persons. ➢ The tool must only be transported in its original packaging. The tool must not be lifted directly from below with mechanical tools without a support pallet (e.g. forklift truck). The tool must not be dragged.

4. Description of the instrument

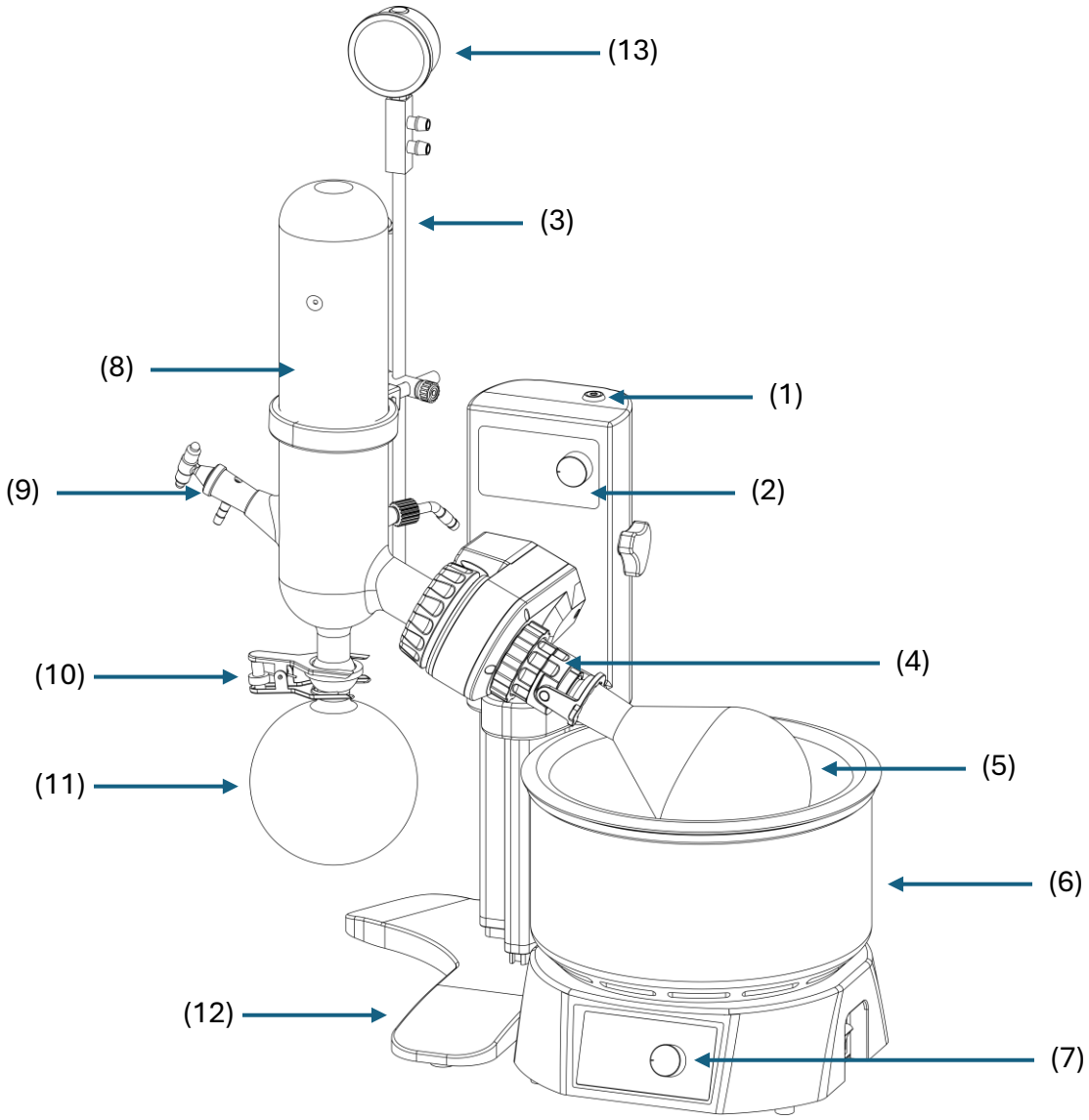
4.1 General view of the instrument

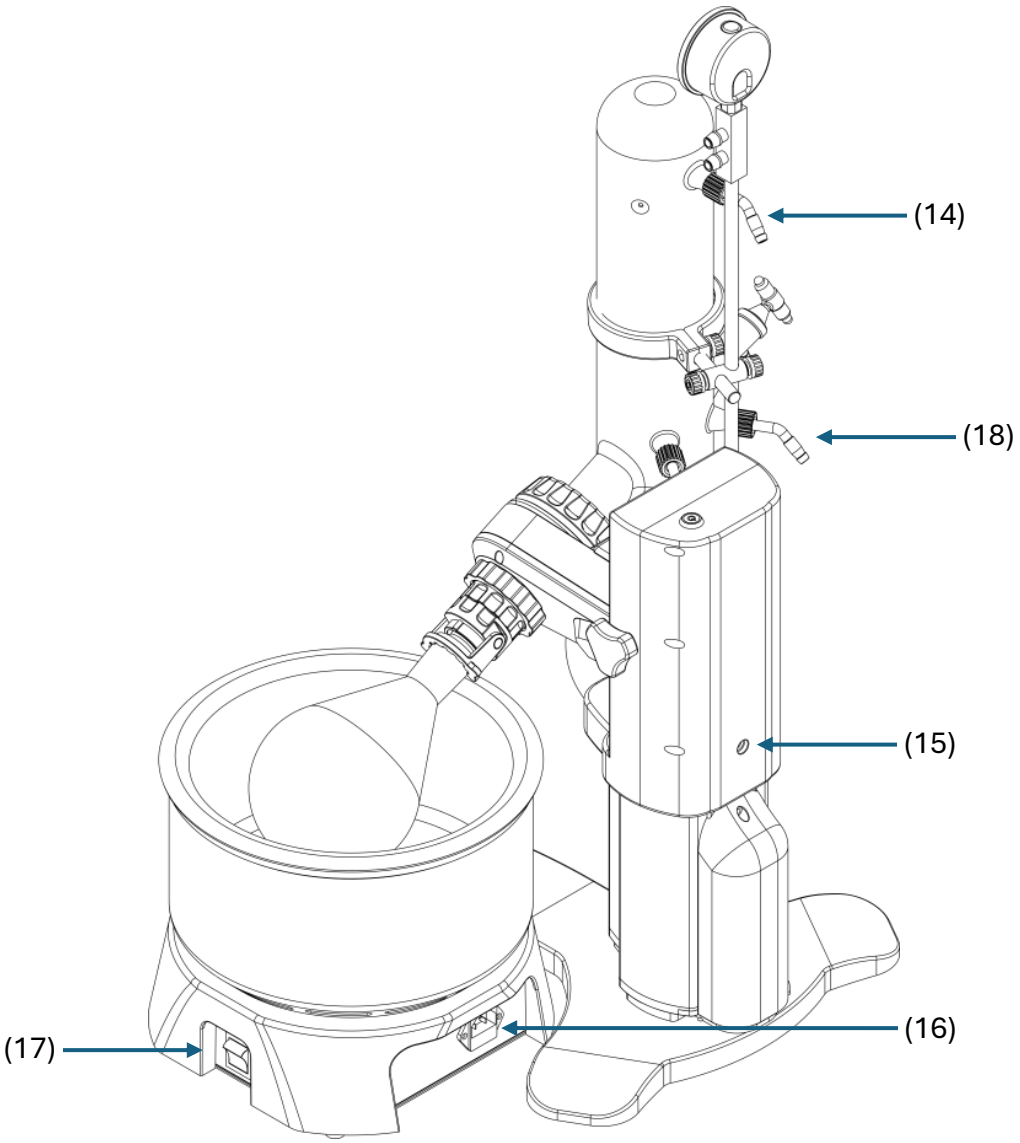
The RV-5A rotary evaporator is a bench-top instrument designed for the evaporation and distillation of solvents under vacuum in a laboratory environment.

The instrument consists of:

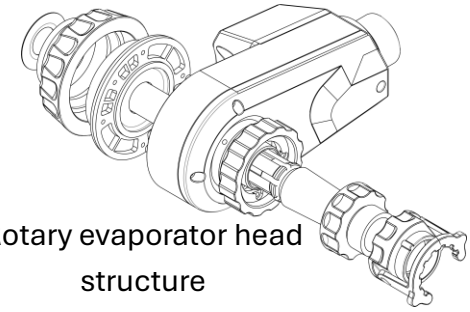
- a main unit with a rotation motor
- a motor unit lifting system
- a separate heating bath
- a glassware system for evaporation and condensation

The compact design allows for easy installation on a laboratory bench or inside a fume hood.





(1)	Power button	(2)	Rotation control panel
(3)	Support rod	(4)	Head
(5)	Evaporation flask	(6)	Water or oil heating bath
(7)	Heating bath control panel	(8)	Condenser
(9)	Supply/vent valve	(10)	Stainless steel clip
(11)	Collection balloon	(12)	Base
(13)	Pressure gauge (*optional, not included*)	(14)	Vacuum connection
(15)	Head power supply	(16)	Heating bath power supply
(17)	Heating bath on/off switch	(18)	Cooling connection



Rotary evaporator head structure

4.2 Main components

The main components of the RV-5A rotary evaporator are illustrated and include:

- motor unit with control panel
- evaporation flask
- glass rotation shaft (glass axis)
- condenser
- collection flask
- heating bath with dedicated control panel
- supply/vent valve
- connections for vacuum and cooling
- support base
- pressure gauge (*not included, optional*)

Each component is designed to ensure stability, safety and ease of use.

4.3 Description of mechanical parts

Motor and transmission unit

The motor unit is responsible for rotating the evaporation flask.
The movement is transmitted to the glass rotation shaft, ensuring uniform and adjustable rotation.

The rotation speed can be set via the control panel and is shown on the display.

Lifting system

The motor unit and glassware can be adjusted in height to allow partial immersion of the flask in the heating bath.

The motorised lifting system allows for precise and safe positioning of the evaporation flask.

Base and supporting structure

The base of the instrument ensures stability during operation and is designed to support the weight of the complete system, including the glassware and heating bath.

4.4 Glassware and connections

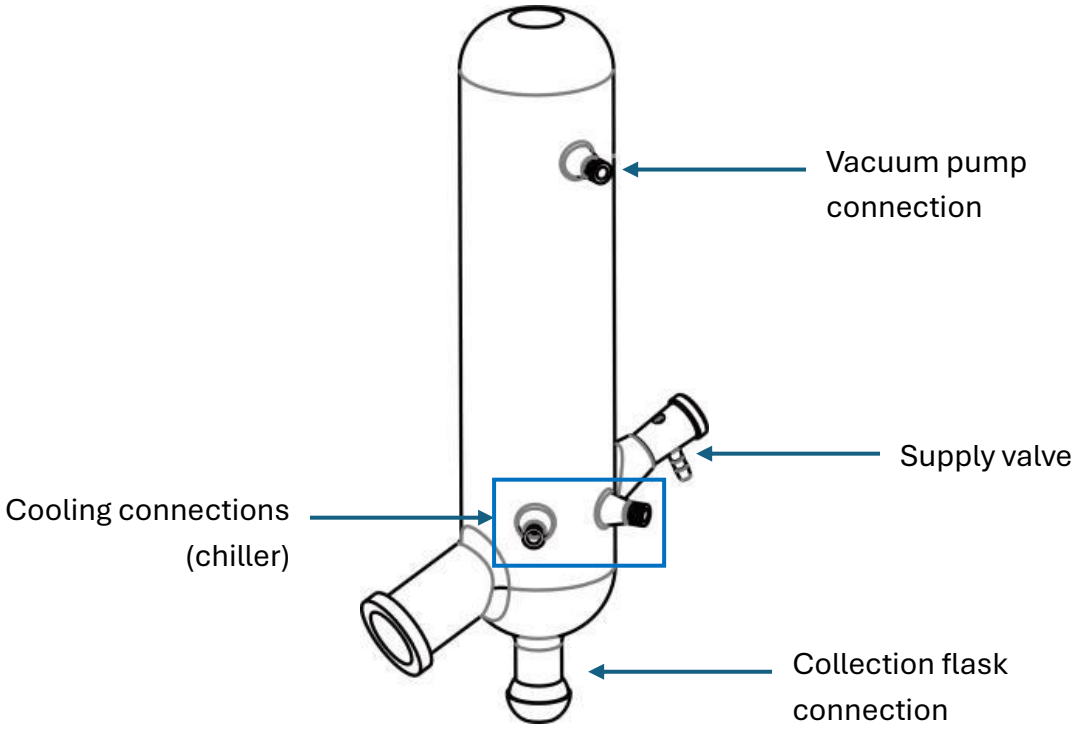
Glassware

The RV-5A rotary evaporator glassware system includes:

- 1000 ml evaporation flask
- rotation shaft (glass axis)
- condenser
- 1000 ml collection flask
- feed valve

All glass components are made of borosilicate glass, suitable for vacuum use and laboratory applications.

Before each use, the glassware must be **checked** for cracks, chips or defects.



Vacuum connection

The vacuum connection is made via the appropriate fitting on the condenser or pressure gauge (**not included, optional**).
The vacuum is provided by an external pump (**not included**).

All connections must be:

- properly tightened

- fitted with seals in good condition
- compatible with the required vacuum level

Cooling connection

The condenser is equipped with connections for **the inlet** and **outlet** of **the refrigerant**. Cooling can be provided by:

- mains water
- recirculating ch**iller**

Correct connection of the cooling system is essential to ensure efficient condensation of vapours.

4.5 Heating bath

The heating bath is a separate unit equipped with:

- container for the heating fluid
- heating element
- dedicated control panel
- protection systems against overheating and dry running

The bath temperature is adjustable and displayed on the control panel.

The bath is available in 2 different versions:

1. Water bath (+5°C Ta … 99°C)
2. Oil bath (+5°C Ta … 180°C)

4.6 Identification plate

The identification plate is affixed to the body of the instrument and allows for the unique identification of the RV-5A rotary evaporator.

The plate generally shows the following information:

- instrument model and serial number
- power supply, frequency and nominal power

This information must always be provided when requesting technical assistance or spare parts.

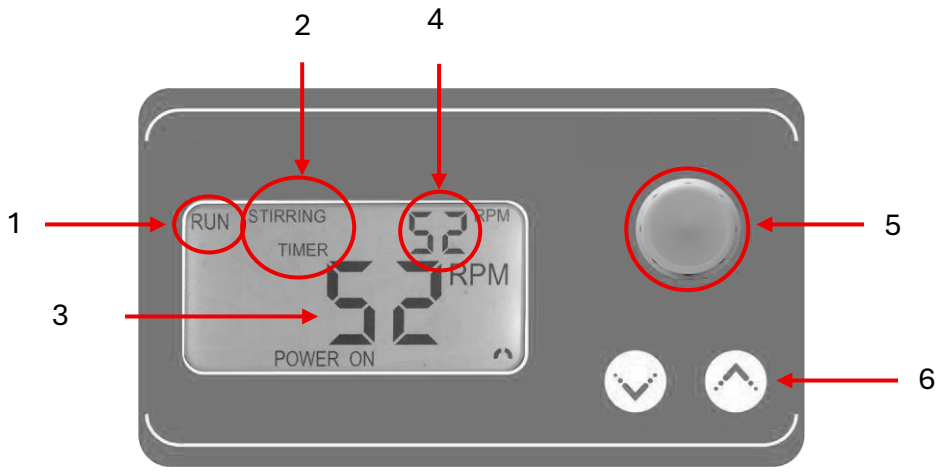
5. Control panels and controls

5.1 Evaporator control panel

The RV-5A rotary evaporator is equipped with a digital control panel that allows you to manage the main operating functions, including:

- starting and stopping rotation using the control knob (5)
- adjustment of rotation speed via control knob (5)
- setting the operating time
- control of the motor unit lift (6)

The control panel is located on the front of the motor unit, in a position that is easily accessible to the operator.



5.2 Display and symbols

The evaporator display clearly shows the operating status of the instrument and the set parameters.

The display can show:

- operating status (**RUN/STOP**) **(1)**
- Active functions ("stirring" and "timer") **(2)**
- current rotation speed **(3)**
- set rotation speed **(4)**

The symbols on the display allow the operator to quickly recognise the active operating mode.

5.3 Setting the rotation speed

The rotation speed of the evaporation flask can be adjusted using the control knob on the control panel.

Procedure:

1. Turn the knob **(5)** to select the desired speed value.
2. When the set value flashes on the display, press the knob to confirm.

The rotation speed must be selected according to the type of sample, solvent and flask volume.

5.4 Setting the timer

After setting the flask rotation (RPM), the control panel allows you to set an operating time for the rotation. (The time 00:00 will correspond to a continuous work cycle, with indefinite time)

Procedure:

1. After setting the flask rotation, turn the knob to select the time setting mode.
2. Set the desired operating time by turning the knob.
3. Press the knob to confirm the setting.
4. Start the work cycle by pressing the knob.

At the end of the set time, rotation will stop automatically and the instrument will emit an acoustic signal.
Operation can be interrupted manually at any time by pressing the knob.

5.5 Motorised lifting

In the motorised lifting version, the height of the motor unit is adjusted using dedicated buttons on the control panel **(6)**.

To adjust the height:

1. Press the up or down button.
2. Release the button once the desired height has been reached.

Lifting must **only** be performed **when rotation has stopped**.

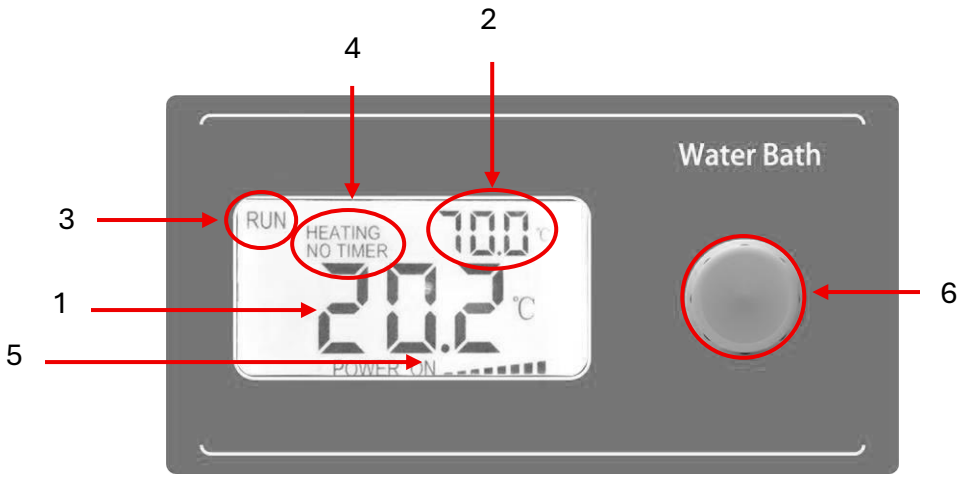
5.6 Heating bath control panel

The heating bath is equipped with an independent control panel that allows you to:

- switching the heating on and off
- setting the temperature
- setting the heating time
- viewing the operating status

The heating bath display shows:

- current fluid temperature **(1)**
- set temperature **(2)**
- operating status (**RUN/STOP**) **(3)**
- operating mode **(4)**
- Heating power **(5)**







5.7 Setting the bath temperature and duty cycle duration

The temperature of the heating bath is set using the knob on the bath control panel **(6)**.

Procedure:

1. Switch on the heating bath.
2. Turn the knob to select the desired temperature.
3. Press the knob to confirm the setting.
4. The display will then ask you to enter the operating time (timer function):
    1. The time 00:00 corresponds to a **continuous operating cycle** with **no time limit**.
    2. Any other value will activate the timer function. Once the set temperature has been reached, the appliance will run for the set time (for example, 01:30 will correspond to a 90-minute cycle). At the end of the cycle, the appliance will stop heating.
5. Press the knob to confirm the setting.
6. Press the knob again to start the work cycle.

The bath will automatically start heating until the set temperature is reached.

⚠ **Warning**
Do not use the heating bath without fluid. Dry operation can cause irreversible damage to the instrument.

5.8 Electronic temperature limiter

The heating bath is equipped with safety systems that protect the instrument from overheating.

There are two levels of protection, one electronic and one electromechanical. If the protection system is activated:

- heating is automatically interrupted
- the instrument must be switched off and left to cool

Before resuming operation, always check the presence and level of fluid in the bath.

It is possible to set a **temperature limit**. To do so, follow these instructions:

1. press and hold the bath adjustment knob for a few seconds.
2. When the **Lk** parameter appears, select the value **3** using the adjustment knob.
3. Press the adjustment knob to enter the parameter submenu.
4. Under **Tm**, corresponding to the first parameter in the submenu, set the temperature limit. To do this, use the adjustment knob.
   When this temperature is reached, the bath will activate the electronic protection and stop heating.
5. Press the adjustment knob to confirm.
6. Scroll through the rest of the parameters by repeatedly pressing the adjustment knob until you exit the submenu.

5.9 Electromechanical temperature limiter

The **water bath** has an electromechanical device (**fixed temperature**) to interrupt heating. The device is activated in case of **overheating** above 100°C. This can happen if **the bath is mistakenly used dry**.

If the electromechanical device is triggered:

- immediately switch off the instrument and disconnect the power cable.
- wait for the bath to cool down
- empty the bath and turn it upside down
- press the reset button **(7)** while returning the bath to its position
- connect the power cable and proceed with use

The **oil bath** has an electromechanical device that can be adjusted by the user using a special **graduated knob (8)**:

- by selecting the temperature using the graduated knob, it is possible to set the temperature limit beyond which the instrument will disconnect the power supply to the heating element, thus preventing overheating.



6. Installation

6.1 Environmental requirements

The RV-5A rotary evaporator must be installed and used in indoor environments suitable for the use of laboratory equipment.

The installation environment must meet the following requirements:

- ambient temperature between **+5 °C and 35 °C**
- low relative humidity, without condensation (80%RH)
- good ventilation
- no corrosive or explosive atmospheres
- absence of strong electromagnetic fields
- no vibrations or shocks

The instrument must be installed away from heat sources and direct sunlight.

6.2 Positioning the instrument

The RV-5A rotary evaporator must be positioned on a surface that is:

- stable
- flat
- that can support the weight of the instrument complete with glassware and heating bath

It is recommended to leave a minimum clearance of **50 cm** on all sides and sufficient space above for mounting and removing the glassware.

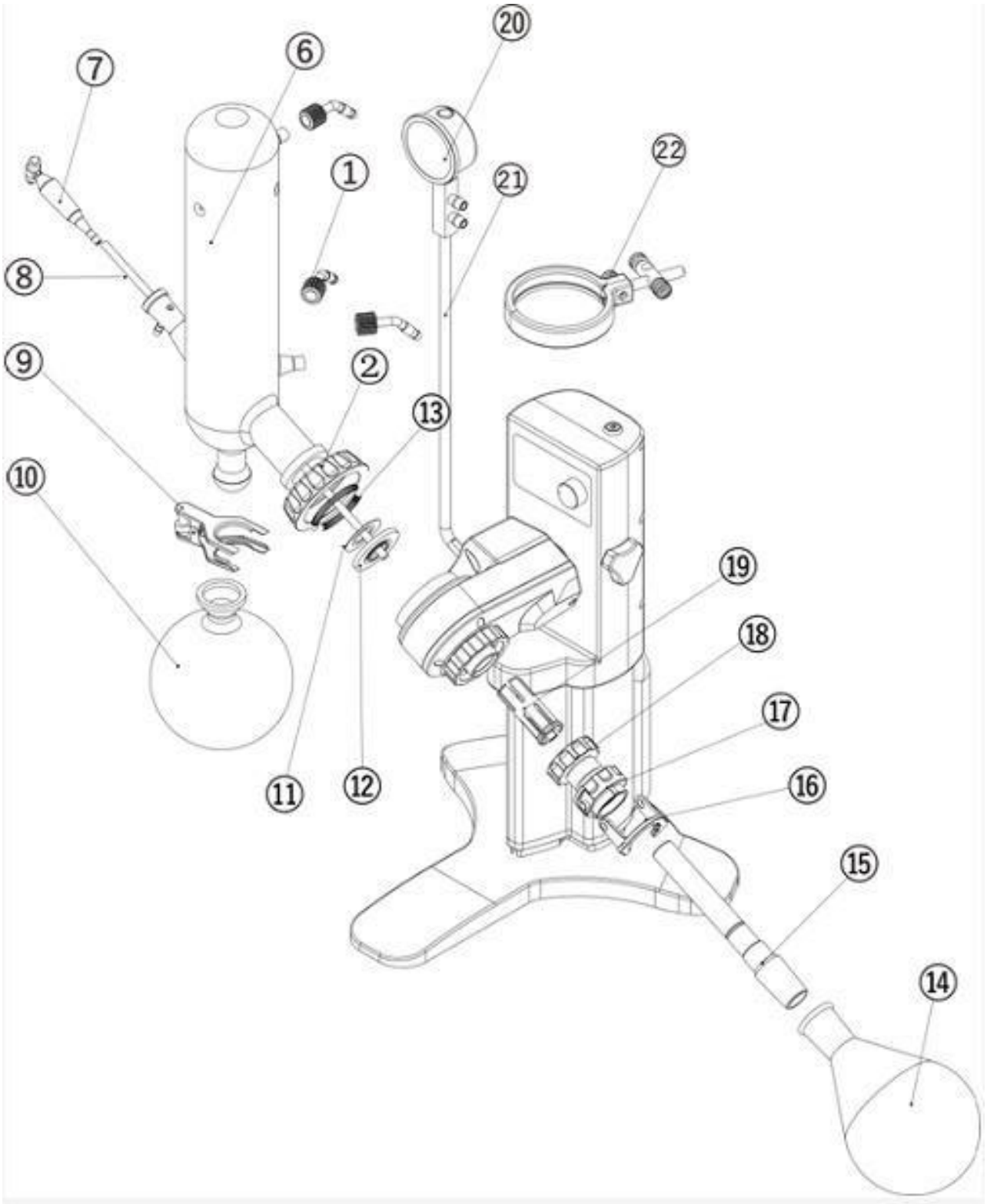
During operation, the instrument must not be able to move or tip over due to vibrations or accidental movements.

6.3 Mounting the instrument

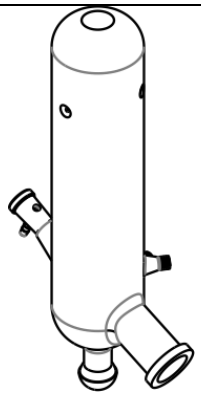
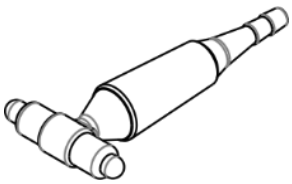
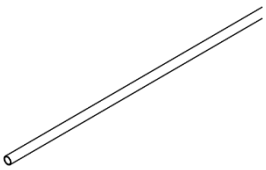
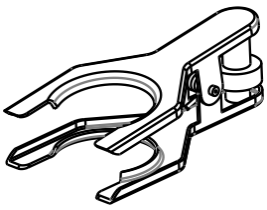
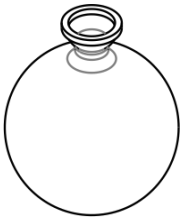
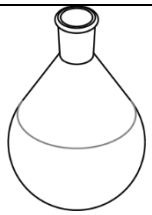
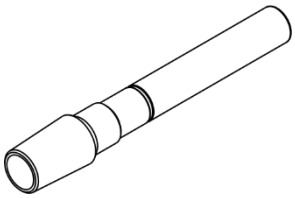
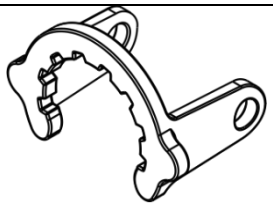
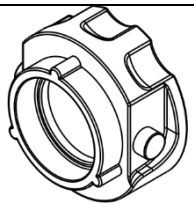
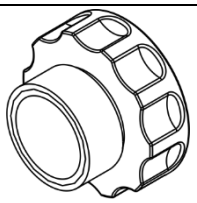
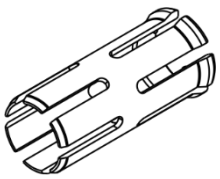
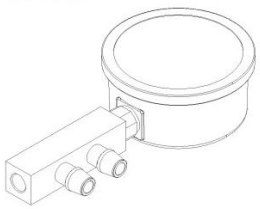
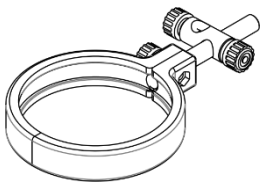
Before starting installation:

- make sure that the instrument body is disconnected from the mains
- check that all glassware is intact and clean and that all components are present; if not, contact your dealer.

RV-5A layout



List of components

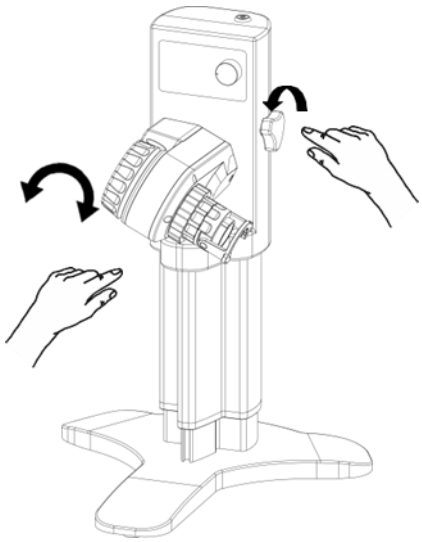
 *1– Connection fitting for refrigerant/water or vacuum.* ***Quantity 3***	 *2– Condenser ring nut*	 *6 – Condenser*	 *7 – Supply/vent valve*
 *8 – PTFE pipe*	 *9 – Stainless steel clip*	 *10 – 1000 ml receiving flask*	 *11 – Secondary seal*
 *12 – Main seal*	 *13 – Condenser clamping spring*	 *14 – 1000ml evaporation flask*	 *15 – Glass axis*
 *16 – Clamping clip*	 *17 – F clamping block*	 *18 – Clamping block M*	 *19 – Glass axis holder*
 *20 - Pressure gauge*	 *21 – Condenser support*	 *22 – Condenser support ring*	 *23 – Kit composed of 2 insulated pipes*

Adjusting the angle of the distillation head

To adjust the angle of the distillation head, proceed as follows:

1. Loosen the locking handle by turning it anticlockwise.
2. Manually rotate the distillation head until the desired angle is reached.
3. Tighten the locking handle again by turning it clockwise to secure the position.

Refer to the figure for component identification.



Installation of components (condenser and glassware)

The instrument is supplied with the components listed below already installed.
The following instructions are provided for reference in case it is necessary to disassemble and subsequently reassemble one or more components.

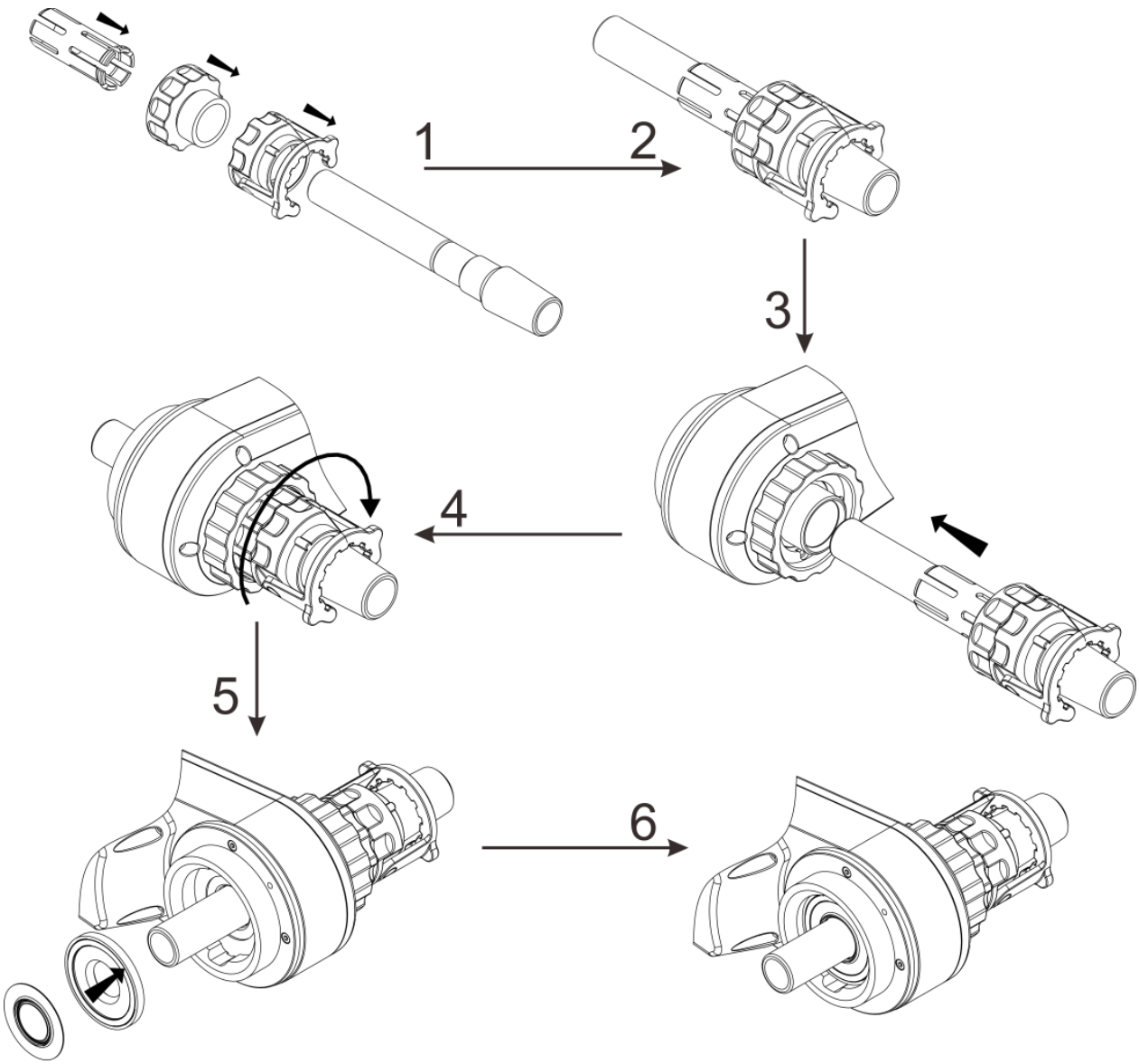
Arrange the following components in the order shown in the figure:

- glass axis (15)
- clamping block F (17) including clamping clip (16)
- clamping block M (18)
- glass axis holder (19)

Insert the glass rotation shaft (15) into the clamping block F (17) including the clamping clip (16). Then insert the clamping block M (18) and screw it to the block and the glass axis holder (19). Insert everything into the distillation head following the direction indicated by the arrow in the figure.

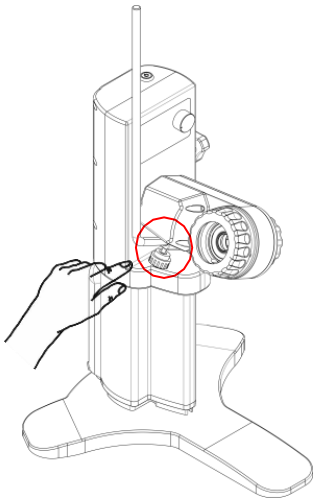
Holding the rear ring of the shaft in place, tighten the clamping block M (18) by turning it clockwise until the shaft is secured in position.

Place the main gasket and auxiliary gasket on the opposite side of the distillation head as shown in the figure.



For the initial installation, proceed as follows:

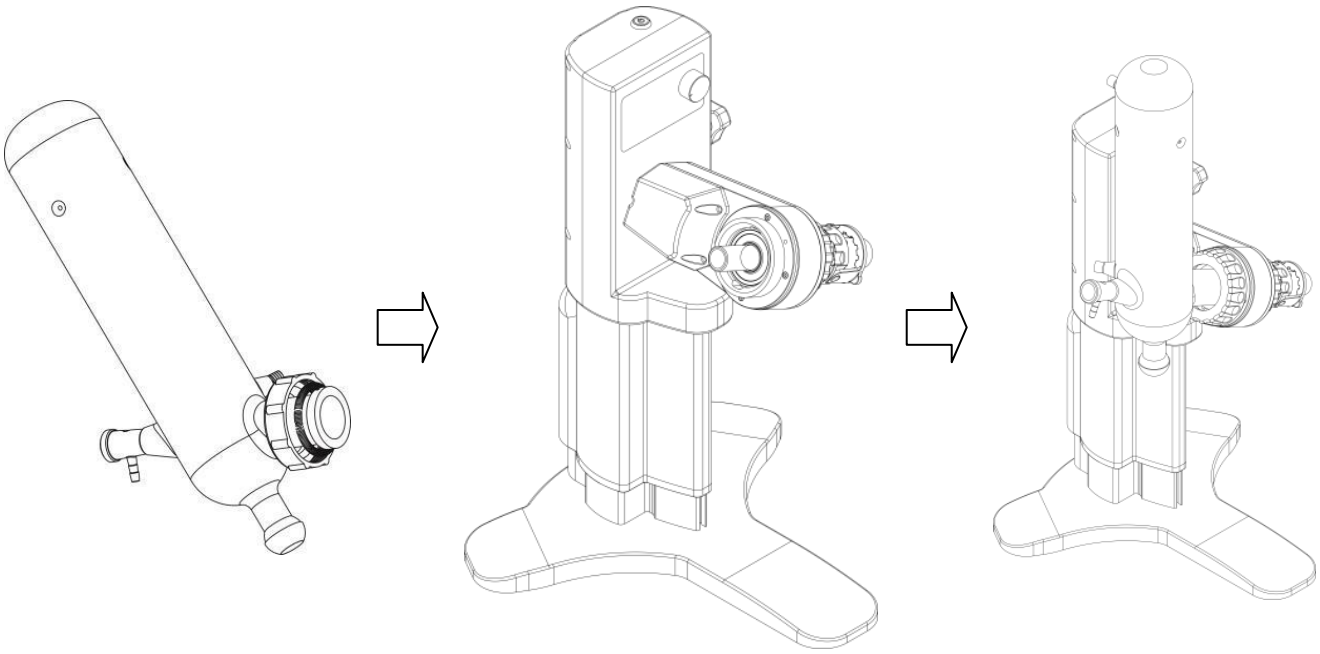
Mount the condenser support rod (21) on the main unit.
Secure the rod by tightening the 2 locking knobs until it is firmly anchored.



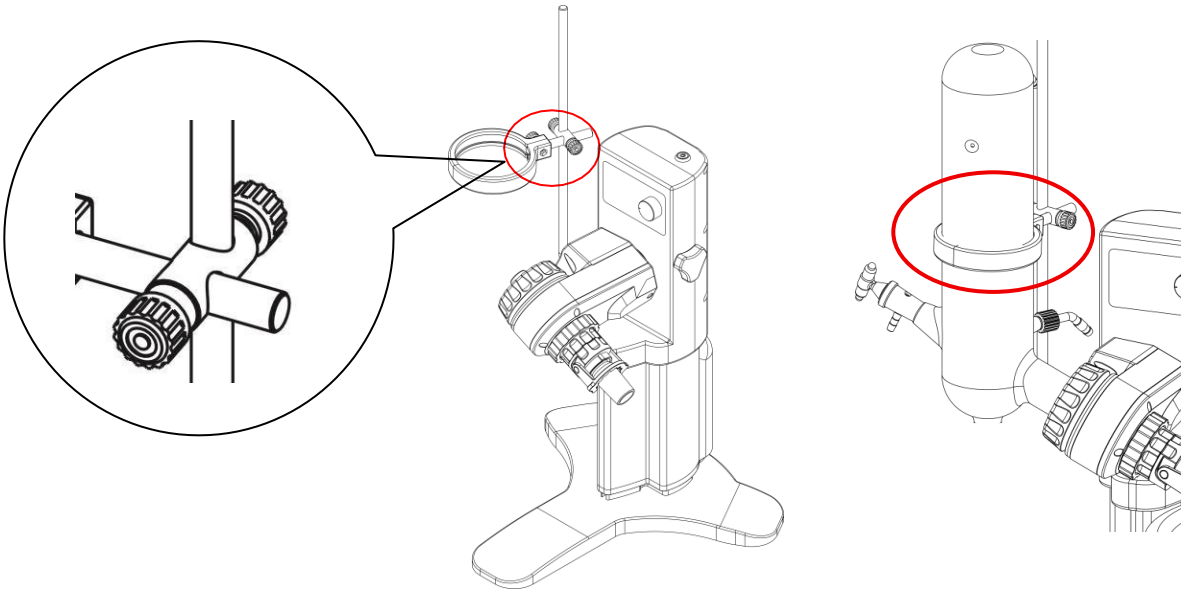
Insert the condenser ring nut (2) and then the condenser clamping spring (13) into the condenser joint.

Align the surface of the condenser joint with the main gasket and auxiliary gasket in the distillation head, then tighten the fastening system evenly by turning the condenser ring nut until a stable seal is achieved. The condenser will then be connected to the rotary evaporator head.

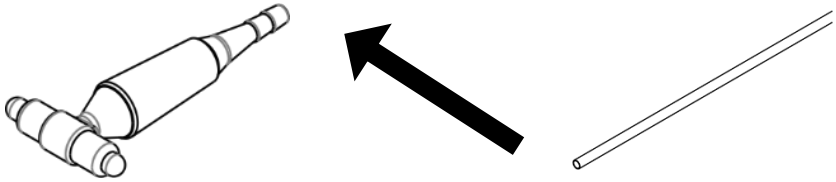
Refer to the figure for the correct positioning of the components.



Insert the support ring (22) into the condenser support rod (21), making sure that the ring embraces the condenser itself. Once the condenser support ring is in place and correctly aligned, secure it by tightening the locking knobs.



Insert the PTFE tube (8) into the lower connection of the supply valve (7).

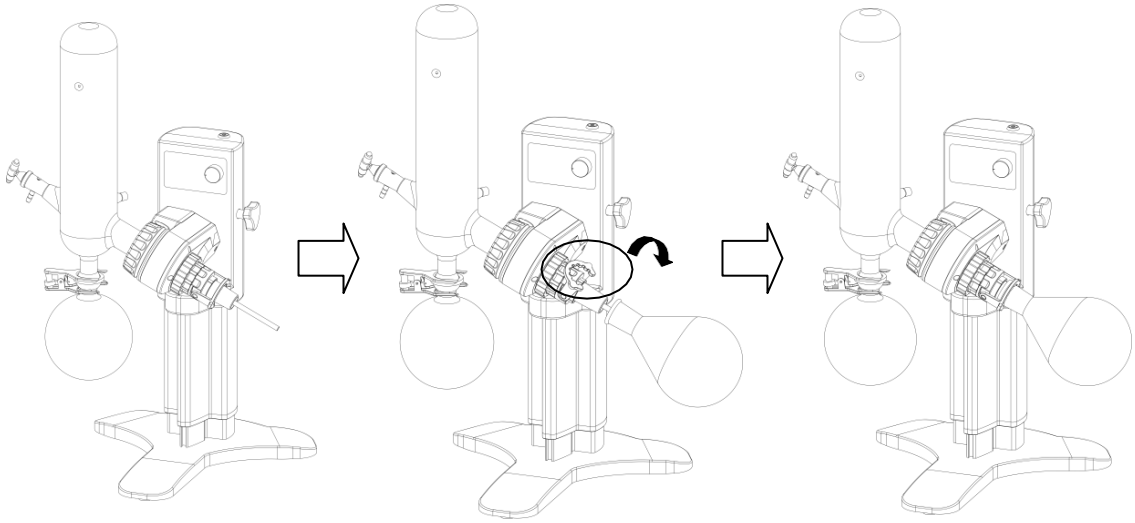


Then insert the whole assembly through the side connection of the condenser and adjust the angle of the supply valve to ensure a proper seal.

Secure the collection flask (10) to the lower connection of the condenser using the stainless steel clip (9).

Then mount the evaporation flask (14) on the lower connection of the glass rotation shaft and secure it with the clamping clip (16).

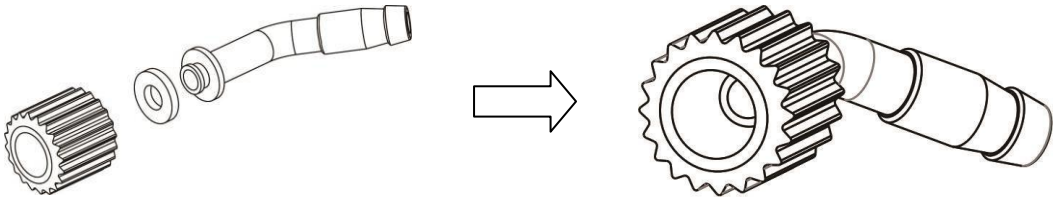
Finally, tighten the locking mechanism (17+18) by turning it clockwise to secure the balloon firmly in place. Refer to the figure for the correct assembly of the components.



Install the two cooling fluid connection fittings (1) and one vacuum fitting (1) on the respective threads of the condenser.

Before installation, check that the gasket is correctly inserted in the seat of each fitting.

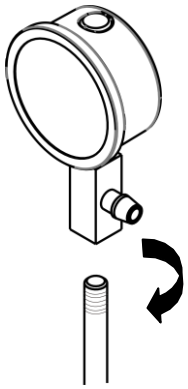
Screw the fittings on by hand and tighten the nut until a secure seal is achieved, without applying excessive force. Refer to the figure for the assembly diagram of the fittings.



Once the components have been installed, check that the condenser is positioned perpendicular to the work surface. If necessary, adjust the angle of the distillation head.

Pressure gauge installation (*optional*)

Wrap sealing tape (PTFE) around the upper thread of the condenser support rod (21), then screw the pressure gauge (20) clockwise until it is securely tightened.



Adjusting the height of the main unit

In the motorised lift version, the height of the main unit is adjusted using the dedicated buttons on the control panel.

Press the up or down button and release it once the desired height has been reached.

If necessary, adjust the angle of the distillation head to achieve the correct alignment of the condenser.

6.5 Connecting the cooling water

The condenser is equipped with connections for the inlet and outlet of the coolant.

Procedure:

1. connect the coolant inlet pipe to one of the two lower connections on the condenser
2. connect the coolant outlet pipe to the remaining lower connection
3. Secure the pipes with appropriate clamps

Cooling can be provided by:

- mains water
- a recirculating chiller

Check for leaks before starting the instrument.



Use of reducer adapters for cooling fluid

When the condenser connection for the cooling fluid is threaded and the recirculating chiller connection pipe has an internal diameter of 10 mm, two reducer adapters must be used.



If the connecting pipe has a diameter of 8 mm, no reducer adapters are required. In this case, the pipe can be connected directly to the condenser connection for the cooling water.

6.6 Vacuum connection

The vacuum connection is made via the appropriate connection on the condenser or via the pressure gauge (*optional*).

Procedure:

1. connect the vacuum pipe to the dedicated connection
2. check that the seals are present and intact
3. connect the other end of the tube to a suitable vacuum pump

The vacuum pump must be compatible with:

- the type of solvent used
- the level of vacuum required by the application

Apply the vacuum gradually to avoid boiling shocks and mechanical stress on the glassware.

6.7 Electrical connection

Before connecting the instrument to the mains, check that:

- the supply voltage and frequency correspond to the values indicated on the rating plate
- the power socket is effectively earthed

Procedure:

1. Connect the power cable to the motor unit
2. Connect the power cable of the heating bath
3. Ensure that the cables are positioned so as not to create any obstacles or hazards

The instrument must be connected to a **dedicated**, easily accessible **socket** so that it can be quickly disconnected in an emergency.

7. Commissioning

7.1 Preliminary checks

Before starting the RV-5A rotary evaporator, check that:

- the instrument is correctly installed on a stable, flat surface
- the glassware is correctly assembled and free from defects
- all connections (vacuum, cooling, power supply) are correct
- the heating bath is filled with suitable fluid
- the vacuum pump and cooling system are ready for use

⚠ **Warning**
Do not start the instrument if there is damaged glassware or unsafe connections.

7.2 Filling the heating bath

Before switching on the heating bath, fill it.

Procedure:

1. Ensure that the heating bath is switched off and disconnected from the mains.
2. Fill the bath with the appropriate fluid (water or oil, depending on the application).
3. The fluid level must be sufficient to cover the heating element.
4. Do not exceed the maximum level indicated.

⚠ **Warning**
It is forbidden to switch on the heating bath without fluid.

7.3 Starting the system

To start the system:

1. Switch on the condenser cooling system.
2. Switch on the vacuum pump, initially keeping the vent valve open.
3. Switch on the evaporator motor unit.
4. Switch on the heating bath.

Check that all devices are operational before proceeding with evaporation.

7.4 Setting the operating parameters

Set the working parameters according to the sample and solvent used.

Main parameters:

- **rotation speed** of the flask
- **heating bath temperature**
- **vacuum level** applied
- **coolant flow rate**

Adjust the parameters gradually to avoid boiling shocks and ensure controlled distillation.

7.5 Start of evaporation

To start evaporation:

1. Place the sample in the evaporation flask.
2. Secure the flask correctly with the appropriate clip.
3. Start the flask rotation.
4. Lower the motor unit until the flask is partially immersed in the heating bath.
5. Gradually apply the vacuum until the desired operating conditions are reached.

During evaporation:

- constantly monitor the process
- check for solvent condensation
- intervene in case of anomalies

⚠ **Note**
Do not leave the instrument unattended during operation.

8. Operational use

8.1 Adjusting the angle of the flask

The angle of the evaporation flask can be adjusted to optimise immersion in the heating bath and improve the efficiency of the evaporation process.

Procedure:

1. Ensure that rotation has stopped.
2. Loosen the angle locking device on the distillation head.
3. Manually adjust the angle to the desired position.
4. Tighten the locking device again.

⚠ **Warning**
Do not adjust the angle of the flask during rotation or when the system is under vacuum.

8.2 Height adjustment

The height of the motor unit and glassware must be adjusted so that the evaporation flask is partially immersed in the heating bath.

Motorised lift version

1. Use the up or down buttons on the control panel.
2. Release the button once the desired height has been reached.

⚠ **Note**
Height adjustments should preferably be carried out with the motor stopped or running at low speed.

8.3 End of process

At the end of evaporation, proceed as follows:

1. Gradually reduce the vacuum by opening the vent valve.
2. Stop the rotation of the flask.
3. Lift the motor unit until the flask is removed from the heating bath.
4. Switch off the bath heating.

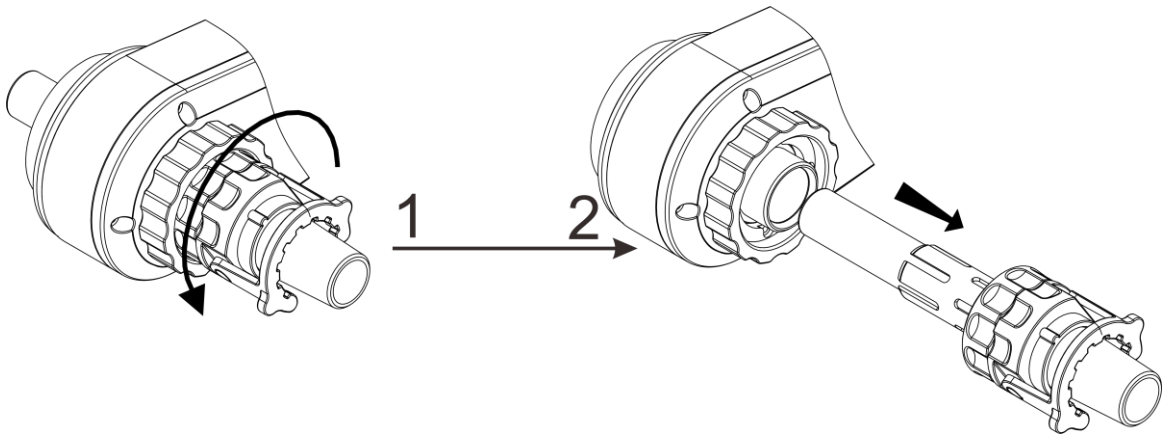
⚠ **Warning**
The evaporation flask and heating bath may still be hot. Avoid direct contact.

8.4 End of evaporation

1. At the end of the evaporation process, switch off the rotary evaporator and stop the rotation of the evaporation flask.
   Then lift the main unit using the lifting system until the flask is removed from the heating bath.
2. Open the feed/vent valve by turning it to **gradually restore the internal pressure**, then switch off the vacuum pump.
3. If no further sample additions are planned, switch off the condenser cooling system and the heating bath.

Note
At the end of distillation, the heating bath and evaporation flask may remain hot for a prolonged period of time. Take care to avoid the risk of burns.

4. **Removing the evaporation flask**
   Support the evaporation flask with one hand, remove the fixing clip and carefully slide the flask off the rotating shaft.
5. **Removing the collection flask**
   Support the collection flask with one hand, then remove the fixing clip and separate the flask from the condenser.
6. **Removing the rotation shaft**
   Disassemble the rotation shaft following the procedure shown in the figure, working carefully to avoid damaging the glassware.



9. Maintenance and cleaning

9.1 General warnings

Maintenance and cleaning operations must **only** be carried out **when the instrument is switched off**, disconnected from the mains and completely cooled down.

It is forbidden to:

- disassembling internal electrical or mechanical components
- using aggressive or abrasive detergents
- pouring liquids directly onto the instrument

Any extraordinary maintenance must be performed by authorised technical personnel.

9.2 Cleaning the instrument

Regular cleaning of the instrument helps to ensure safety, reliability and long service life.

Procedure:

- clean the external surfaces with a soft, slightly damp cloth
- for stubborn dirt, use a neutral detergent
- Dry all surfaces thoroughly after cleaning

⚠ **Warning**
Do not use solvents, alcohol, acetone, thinners or corrosive products to clean the instrument.

9.3 Cleaning and lubricating the seals

The seals of the rotation system and glass connections are critical elements for proper vacuum operation. Procedure:

1. Carefully disassemble the parts concerned.
2. Clean the contact surfaces with a soft cloth or lint-free paper.
3. Apply a **thin amount of** compatible **vacuum grease**.
4. Reassemble the seals, checking that they are correctly positioned.

⚠ **Note**
Excessive grease can compromise the seal and attract contaminants.

9.4 Routine maintenance

Routine maintenance includes the following activities:

- periodic inspection of the integrity of the glassware
- checking the condition of the seals
- checking the vacuum and cooling tubes
- checking the correct functioning of the controls

It is recommended that these checks be performed **before each use** and at regular intervals during intensive use.

9.5 Parts subject to wear

Some components of the RV-5A rotary evaporator are subject to normal wear over time, including:

- gaskets and seals
- vacuum and cooling pipes
- fastening clips
- glassware components

These components must be replaced periodically or in the event of damage, using only suitable spare parts.

10. Troubleshooting

10.1 Troubleshooting guide

In the event of a malfunction, follow this procedure:

1. shut down the instrument safely
2. disconnect the power supply
3. identify the symptom observed
4. check the possible causes listed
5. apply the suggested corrective actions

If the problem persists, **do not use the instrument** and contact technical support.

10.2 Rotation problems

Symptom	Possible cause	Corrective action
Rotation does not start	No power supply	Check the electrical connection
	Speed not set	Set a rotation speed
	Motor faulty	Contact customer service
Irregular rotation	Rotation shaft dirty	Clean and lubricate the seals
	Worn seals	Replace the seals
Abnormal noises	Wear on mechanical components	Contact customer service

10.3 Heating problems

Symptom	Possible cause	Corrective action
The bathroom does not heat up	Bathroom switched off	Switch on the heating
	Temperature not set	Set the temperature
	Thermal protection active	Allow to cool and reset
	No fluid	Fill the bath
Unstable heating	Insufficient fluid level	Adjust fluid level

10.4 Vacuum problems

Symptom	Possible cause	Corrective action
Insufficient vacuum	Leaks in connections	Check pipes and fittings
	Worn seals	Replace seals
	Unsuitable pump	Check pump specifications
Sudden loss of vacuum	Damaged glassware	Replace glassware
	Vent valve open	Close the valve properly

10.5 When to contact support

Contact technical support in the following cases:

- electrical or electronic faults
- persistent abnormal noises
- repeated activation of safety devices
- structural damage or damage to glass
- problems that cannot be resolved using the procedures described

When contacting customer service, always provide:

- instrument model
- serial number
- detailed description of the problem

11. Technical data

11.1 Technical specifications

Feature	Value
Model	RV-5A
Type	Rotary evaporator for laboratory use
Lifting system	Manual or motorised (depending on version)
Rotation speed	20 – 300 rpm
Speed adjustment	Digital
Motor	Brushless DC motor
Evaporation flask capacity	up to 1 L
Evaporation capacity	Approximately 22 mL/min*
Condenser	Coil condenser
Condensation surface area	approx. 0.15 m²
Sealing system	PTFE
Heating bath	External electric heating
Bath temperature range (water)	ambient +5 °C to 99.9 °C
Bath temperature range (oil)**	ambient +5 °C to 180 °C
Heating power	1000 W

* indicative value, depending on the solvent and operating conditions
** only if provided for and permitted by the bath configuration

11.2 Environmental conditions

The RV-5A rotary evaporator is designed for **indoor** use **only**.

Parameter	Value
Ambient temperature	5 – 35 °C
Relative humidity	low, non-condensing
Maximum altitude	up to 4000 m above sea level
Operating environment	laboratory
Ventilation	adequate
Presence of corrosive substances	Not permitted

The instrument must not be used in environments:

- at risk of explosion
- with high humidity
- subject to vibrations or shocks

11.3 Power supply

Characteristic	Value
Nominal voltage	220 V AC
Frequency	50/60 Hz
Connection	single-phase with earthing
Protection	Mandatory earthing
Class of use	laboratory

⚠ **Warning**
Only connect the instrument to sockets with effective earthing.
The use of unsuitable extension cords or adapters is not recommended.

12. Transport, storage and disposal

12.1 Transport

When transporting the RV-5A rotary evaporator, take all necessary precautions to avoid damage to the instrument and glassware.

Before transport:

- switch off the instrument and disconnect it from the mains
- disconnect all connections (vacuum, cooling, power supply)
- completely remove the glassware
- empty the heating bath

The instrument must be transported:

- in an upright position
- using the original packaging, if available
- avoiding shocks, vibrations and excessive tilting

⚠ **Warning**
Do not lift or transport the instrument by grasping the glassware or motor unit.

12.2 Storage

When storing the instrument, observe the following conditions:

- dry and clean environment
- temperature between 5 °C and 40 °C
- no condensation
- protection from dust and corrosive agents

During periods of prolonged inactivity:

- disconnect the instrument from the mains
- Remove glassware and store it separately.
- Loosen any clamping systems

Before putting the instrument back into operation after a long period of storage, carry out a complete visual inspection and check that it is working properly.

12.3 Disposal

Before disposal:

- disconnect the instrument from the mains
- remove any solvent residues
- dispose of glassware and consumables separately



This equipment is classified as an electronic device and is subject to specific regulations for the disposal of such devices. For disposal, strictly comply with the laws and regulations in your jurisdiction regarding electronic waste. It is recommended that you consult your local authorities or the equipment supplier for detailed information on disposal procedures that comply with current environmental regulations.

13. Scope of delivery

13.1 Included components

Upon delivery, the standard supply of the RV-5A rotary evaporator includes the following components:

- RV-5A rotary evaporator main unit
- heating bath (water or oil)
- Kit of 2 tubes, each 2 metres long, including insulating material for connection to the chiller and/or vacuum pump
- power cable for main unit
- power cable for heating bath
- glass rotation shaft (glass axis)
- condenser, 1000 ml evaporation flask and 1000 ml collection flask
- supply/vent valve
- fixing and support system for glassware
- gaskets and seals
- fixing clips
- 3 fittings with hose connectors for vacuum and cooling
- user manual

The exact composition of the supply may vary depending on the configuration ordered.

13.2 Checking the supply

Upon receipt of the instrument:

- check that all components are present
- check the integrity of the instrument and glassware
- immediately report any damage or missing items to the supplier

⚠ **Note**
Do not use the instrument if any components are missing or damaged.

13.3 Optional accessories

The following optional accessories are available, depending on the configuration:

- vacuum pump – **VP-20**
- recirculating chiller – **C3-20**
- vacuum regulator – **VC-50**
- additional glassware or glassware of different volumes
- vacuum and cooling pipes
- protective cover

For information on compatible accessories, refer to the sales documentation or contact your distributor.

14. Shipping for technical assistance

If the instrument needs to be sent **for technical assistance**, it must be properly cleaned and, if necessary, decontaminated from pathogens.

We recommend using the original packaging for shipping. If this is not available, it is important to use **sturdy packaging that is suitable** for ensuring protection during transport.
We recommend removing the shelves and their supports.

Please note that any damage caused by incorrect shipping will not be covered by the warranty. For detailed instructions on cleaning and decontamination, please refer to the "Cleaning and Maintenance" section of the manual or contact technical support directly.

15. Warranty

Under normal conditions of use, this instrument is covered by a warranty for a period of 24 months from the date of purchase.

The warranty is valid only for the product in its original configuration.

It does not apply to products or components that have been damaged as a result of: installation not in accordance with specifications, improper electrical or mechanical connections, inappropriate use or use not in accordance with the operating manual, accidents or fortuitous events, operating conditions outside the specified parameters.

The manufacturer declines all responsibility for damage resulting from use not in accordance with the instructions provided in the operating manual, failure to perform the prescribed maintenance procedures, and unauthorised modifications and alterations to the product.

Please refer to the user manual for detailed instructions on the correct use and maintenance of the instrument.

