

# Instruction manual

VWR<sup>®</sup> VWR Micro Star 12

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Euro Plug: 521-1651

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CE

UK  
CA

## **Legal Address of Manufacturer**

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## EU Declaration of Conformity

**Manufacturer:** VWR International bvba, Haasrode Researchpark 2020, Geldenaaksebaan 464, B-3001 Leuven

The undersigned states that this declaration is issued under the sole responsibility of the manufacturer, VWR International bvba, and that the object(s) of the declaration described in Appendix 1 are in conformity with the relevant Union harmonization legislation.

In the event of unauthorized modification of any of the products listed in the Appendix 1, this declaration becomes invalid.

**Object Name:** VWR Microcentrifuge

**Relevant EC Directives:**

LVD	2014/35/EU as last amended
EMC	2014/30/EU as last amended
RoHS	2011/65/EU as last amended
MD	2006/42/EC as last amended

**Harmonized Standards:**

EN 61010-1:2010
EN 61010-2-020:2017
EN 55011:2016
EN 61000-3-2:2014
EN 61000-3-3:2013
EN 61326-1:2013
IEC 62321:2013
IEC 62321:2015
IEC 62321:2017

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**Signed for and on behalf of VWR International bvba:**

Kris Nijs  
Managing Director

## Appendix 1

Cat. No.	Product
521-1651	Microcentrifuge Micro Star 12



# Table of Contents

Warnings & Notes.....	6
SafetyInformation .....	6
Package Contents.....	8
Installation.....	8
Product Features & Specifications .....	9
Overview.....	11
Operation.....	12
Maintenance and Care .....	13
Troubleshooting .....	15
Ordering Information .....	17
Technical service .....	17
Warranty .....	17
Compliance with local laws and regulations .....	18
Equipment disposal.....	19
APPENDIX .....	20
Local VWR offices in Europe and Asia Pacific.....	21

## Warnings & Notes

Before using, read this operation manual to ensure correct usage and thorough understanding of the instrument. Incorrect handling could possibly result in personal injury or physical damage of the unit or its accessories. The manufacturer accepts no responsibility for any damage caused by mishandling that is beyond normal usage as defined in this manual. The manufacturer is only responsible for the security, reliability and performance of the instrument, if the unit is operated in accordance with the operating instructions. Any adjustments, changes or repairs must be performed by authorized personnel.



This symbol indicates additional warnings to prevent actions that may result in equipment damage, property damage, or personal injury.

### **NOTE**

Notes are intended to provide additional information to clarify specific instructions or highlight information requiring special attention.

## Safety Information

**For your own safety, please review the following precautions:**

- NEVER use a power source other than that designated for the instrument.
- NEVER operate the instrument if it has not been installed or repaired properly. Repairs must be performed only by qualified personnel authorized by VWR
- NEVER use unapproved rotors and associated components. Contact the manufacturer prior to such use to prevent possible damage to the instrument.
- NEVER attempt to open the lid or move the instrument unless the rotor is completely stopped.
- NEVER operate the instrument without a rotor and lid installed correctly and secured to the motor shaft.
- NEVER centrifuge flammable, toxic, radioactive, explosive, or corrosive materials.

**NOTE**

When it is required to handle the Risk Group II materials that are known to be toxic, radioactive materials or pathogenic micro-organisms, as identified in the World Health Organization (WHO): "Laboratory Biosafety Manual," the guidelines recommended by WHO should be followed to ensure the safety.

(<http://www.who.int/csr/resources/publications/biosafety/Labbiosafety.pdf>)

- NEVER exceed the rated speed or specific gravity. Samples whose density is greater than 1.2 g/ml must have reduced maximum rotational speed to avoid rotor failure.
- ALWAYS load the rotor symmetrically with evenly weighted samples to avoid rotor imbalance. If necessary, use the water blank to counterbalance the unpaired sample.
- NEVER use Biosafety rotor without lid
- ALWAYS locate the instrument on a flat, level, rigid, and vibration free surface.
- ALWAYS mark a safety zone of 30 cm around the centrifuge to indicate that neither hazardous materials nor persons should be permitted within the area during operation, as safety regulations required.
- ALWAYS position the instrument with additional free space on each side of instrument to ensure proper ventilation.
- ALWAYS install the instrument within a temperature and humidity-controlled environment. (Permissible ambient temperature: +5 °C – +35 °C, Relative humidity: ≤ 80 %)
- ALWAYS disconnect the power supply prior to maintenance and servicing to avoid electrical shock. Do not immerse.
- ALWAYS use proven disinfection procedures when centrifuging bio-hazardous materials.

Please follow the guidelines above and read this manual in its entirety to ensure safe operation of the unit.

## Package Contents

Main Body, 1 unit

Rotor: Autoclavable fixed angle rotor with 12 tube holes for 1.5 / 2.0 ml tubes, 1 unit

Rotor Lid: Autoclavable biosafety rotor lid, 1 unit

Adapter: Adapter for 0.2 ml PCR tubes, 12 units

Power Supply: AC Power Cable (1.4m), 1 unit

L-type rotor wrench, 5 mm, 1 unit

Operation Manual, 1 unit

Main Body	Rotor & Lid	Adapter for 0.2 ml tubes
		
		Power Cord
		

## Installation

### WARNING!



- Safety regulations require a safety zone of 30 cm around the centrifuge that needs to be marked to indicate that neither hazardous materials nor persons should be permitted within the area during operation.
- Proper ventilation is necessary to prevent the overheating of samples.

1. Inspect the instrument and the parts for any visible signs of shipping damage.
2. Unpack the unit and verify the contents of the package.
3. Place the instrument on a clean, flat, level, and vibration free surface.
4. Plug the power cord into the appropriate power outlet.

### NOTE

Check that the power supply corresponds with the manufacturer's specified electrical requirements.



5. Turn the power on. The switch is located on the rear side of the unit.
6. Once the power is applied, the door will be opened automatically.
7. Carefully place the rotor onto the motor shaft. Hold the rotor with one hand and securely tighten with the supplied rotor wrench the rotor nut to the shaft by turning clockwise.

**NOTE**

Turn the rotor nut counterclockwise to release the rotor from the shaft.

Place the biosafety lid on the rotor and screw on clockwise to secure, see the photo of

Rotor & Lid in the Package Contents on page 8.

## Product Features & Specifications

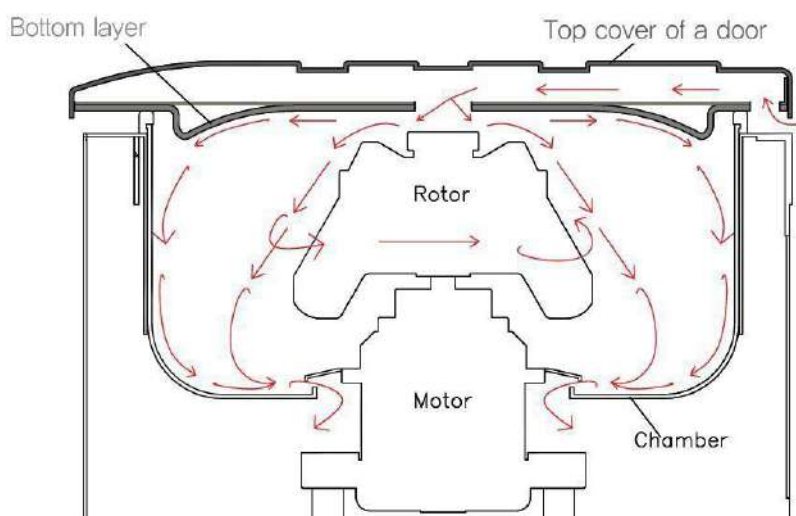
### VWR Micro Star 12

is a benchtop micro-centrifuge designed to be used in all kinds of laboratory work. Its user-friendly control features and compact, space-saving design delivers maximum solid performance for your daily centrifugation needs. VWR Micro Star 12 is supplied with an easily interchangeable rotor to accommodate micro-tubes and (with optional rotor) PCR strips.

#### PRODUCT FEATURES

- Maximum centrifugation speed/force of 13,500 rpm / 12,300 x g
- Compact and space saving design with a small footprint
- Reduce operating time with fast acceleration ( $\leq 12$  sec) / deceleration rates ( $\leq 16$  sec)
- "Pulse" for quick runs
- Highly visible LCD display (blue backlit with white text) and intuitive controls with a soft touch keypad
- Automatic RPM/RCF conversion
- Automatic detection system with audible alarm for over-speed and over-heating.
- Two layered stainless steel door with interlock system for safety and durability
- Maintenance free and environmentally friendly high torque AC induction motor ensures quiet operation
- Unique air flow design prevents overheating of samples
- Supplied with autoclavable fixed angle rotor with screw on biosafety lid.
- Optional PCR rotor

[Schematic diagram of mini's air flow design]



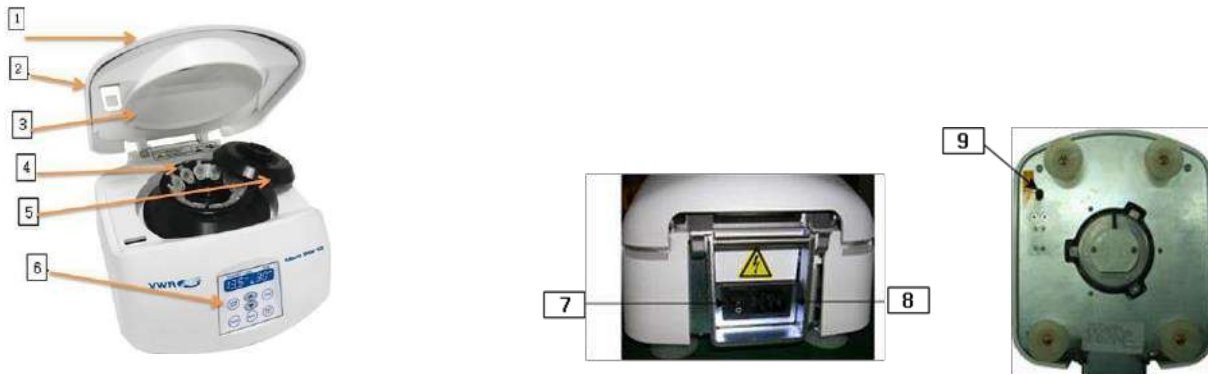
The patented, unique internal design circulates an efficient air inside the instrument, reduces spinning frictions, whilst minimizing both the motor temperature and the noise levels.

## SPECIFICATIONS

	Angle Rotor	PCR Rotor
Maximum RPM	13,500 rpm	6,000 rpm
Maximum RCF	12,300 x g	1,850 x g
Maximum Capacity	12 x 1.5/2.0 ml	4 x (8 x 0.2 ml) PCR strips
Run Time	Timed $\leq$ 30 min	
Acceleration Time	$\leq$ 12 seconds	
Deceleration Time	$\leq$ 16 seconds	
Noise Level	$\leq$ 60 dB(A)	
Motor	High torque AC induction motor	
Power & frequency	230 V, 50/60Hz	
Power requirement	110 VA	
Weight	4.4 kg (for main body only)	
Dimension (W x D x H)	208 x 245 x 145 mm	
RPM/RCF Conversion	Automatic	
Safety lid lock	Automatic	
Certification	CE	

# Overview




## PHYSICAL DESCRIPTION



1. Door
2. Door Lock
3. Center Window
4. Rotor
5. Rotor Lid
6. Control Panel
7. Power Switch
8. Power Socket
9. Emergency Door Open Hole

## FRONT CONTROL PANEL DESCRIPTION



1. Display LCD control panel: Displays set values and actual operating conditions
  - Speed/Force (RPM/RCF): Displays rotor speed/force in RPM/RCF x 1000
  - Centrifugation:  Sign "blinks" whilst spinning.
  - Status of door: Indicates door status as  for open or  for closed.
  - Time: Displays remaining time in min or sec.

2. Speed/force Setting Button: Press to set speed/force value and to switch between RPM and RCF.
3. Door Button: Press to open door.
4. Time Setting Button: Press to set run time between 1 min to 30 min.
5. Pulse Button: Press to use for short spinning.
6. Start & Stop Button: Press to start and stop operation.
7. Up & Down Arrow (▲, ▼) Buttons: Press to change input data.

## Operation



### WARNING!

- Check tubes and rotors for cracks and deformities before each use.
- Do not attempt to open the lid unless the rotor has stopped completely.
- Do not exceed safe rotor speed. (especially, the PCR rotor allows only up to 6,000rpm.)
- The operator should not leave the centrifuge until the full operating speed is attained and the machine appears to be running safely without vibration.
- Stop the centrifuge immediately and unplug the power cord if an unusual condition (noise or vibration) begins.
- If tube breakage occurs, turn centrifuge off immediately. Leave for 30 minutes to reduce the risk of aerosols. The operator should wear suitable gloves, remove debris, clean and disinfect centrifuge interior and rotors.
- If breakage occurs, rotor should be opened in a Biological Safety Cabinet to prevent contamination from any aerosol that has formed.
- Clean all spills immediately and decontaminate the instrument and rotor after use with biological or radioactive materials.

1. Turn the power switch to “ON” position. The switch can be found on the rear of the instrument.
2. Press the “Door” button on the control panel to open the door.
3. Load sample tubes into the rotor symmetrically with evenly weighted samples and securely close the rotor lid by placing the biosafety lid on the rotor and securing by screwing on in clockwise manner.

### NOTE

Do not attempt to exceed the maximum load or speed of the rotor. The maximum allowable speed needs to be reduced to spin solutions with a density greater than 1.2 g/ml, see Appendix for details.

4. To set or change the centrifugation parameters, follow the instruction below.

- Speed/Force: Press the “RPM/RCF” button and press the arrow buttons (▲, ▼) to select or change speed in increments of 100 RPM from 1,200-13,500 RPM.

**NOTE**

Press the “RPM/RCF” button once again to enter or change the force in RCF or convert speed in RPM to RCF.

- Time: Press the “Time” button and press the arrow buttons (▲, ▼) to adjust the desired length of spin time from 1 ~ 30min. The remaining operation time will be displayed.
- Pulse: Press the “Pulse” button on the control panel for quick spin cycle. Press and hold the button for desired length of time and release to deactivate it.

5. Close the centrifuge door by press down firmly until the latch handle is fully retracted.

**NOTE**

The instrument will not operate if the door is not properly latched.

6. Press the “Start/ Stop” button to start the centrifuge, and at any time, press the button again to stop the operation.
7. The door opens automatically at the completion of the run and the rotor stops fully.

**NOTE**

In the event of a power failure or malfunction, the door can be opened manually with Emergency Door Open function. See overview of physical description pos. 9. Do not turn the instrument upside down when using this function but lift the instrument so you can get access to the emergency door open hole. Use a screwdriver to move the latch in the advised direction.

Remove the samples. Clean the instrument and rotor thoroughly.

## Maintenance and Care

**WARNING!**



- Do not immerse the instrument in liquid or pour liquids over it.
- Before cleaning or maintenance, always isolate and disconnect the power supply to eliminate the risk of electric shock.
- Do not use any volatile chemicals such as alcohol, benzene, acetone, and etc.
- Liquids must not come into contact with the motor.
- Always use a lint-free cloth and non-corrosive, neutral cleaning agents with pH value 6-8 to clean all parts. Rinse thoroughly with distilled water and dry completely.

## **ROTOR**

- Preparation for the cleaning
  1. Remove any rotor adapters and tubes from the rotor prior to cleaning.
  2. Remove the rotor securing nut from the motor shaft by turning counterclockwise,
  3. To remove the rotor from the motor shaft, carefully lift the rotor directly upward in a straight vertical motion.
- Keep the rotor clean and dry at the end of each workday, and immediately after any spill.
- Periodically inspect the rotor for dents, dings, scratches, discoloration and cracks. If any of these signs are evident, discontinue use and replace the rotor immediately.
- Always use non-metallic, soft brush to wash rotors to prevent corrosion that can emanate from scratches.
- Remove adapters after use and inspect for corrosion.
- Remove O ring prior to sterilization of the rotor
- Check O ring for signs of wear and tear
- The rotor and the rotor lid can be autoclaved at 121 °C in 20 minutes

## **CENTRIFUGE BODY (External surfaces and the Chamber)**

- All parts should be wiped down periodically to prevent corrosives or contaminants from drying on component surfaces.
- In case of glass tube breakage, all parts must be thoroughly cleaned and all broken particles must be removed completely.
- Abrasions or scratches should not be made on the surfaces, as corrosion may result.

## **TRANSPORT**

- Avoid impacts during transportation and do not drop the unit as damage will result.
- Always remove the rotor and pack the inside of the chamber with protective packaging before transporting the instrument. This prevents damage and minimizes any impact to the shaft.

## **RETURN**

- Before returning the unit and/or associated accessories, for any reason, prior permission must be obtained from the manufacturer.
- All parts **MUST** be shipped along with "Return Authorization Document" (RAN) and "Certificate of Decontamination." Please contact VWR Service to obtain the forms.

### **NOTE**

In order to protect our personnel, Certificate of Decontamination needs to be filled out completely to ensure that all parts are free from pathogens, chemical hazards, and/or radioactivity. Sterilization and decontamination **MUST** be done prior to returning the parts.

- Failure to attach the forms will result in return or disposal of the items without review of the reported problem.

## Troubleshooting

In the event of a malfunction, the error message with code number appears to indicate the probable causes and the instrument will cease to operate. If other malfunctions without error code indication occur, turn off the power immediately, identify the causes and follow the corrective actions as recommended below. For any problems not covered here or you are unable to correct the malfunction, contact VWR Service for assistance.


If the instrument stops due to an error indication, the run cannot be restarted until the error is cleared. After the problem is corrected, reset the instrument to check if the error occurs again.

Error code	Description	Causes	Actions
Error 1	Faulty motor	If the speed does not reach 200 rpm within 2 seconds after motor starts to operate, this message may appear.	<p>Check whether the motor is normally working or not by listening the sound or touching the instrument. Try to turn off and on the power supply if it comes to normal.</p> <p>If the error message does not disappear, please contact VWR service department.</p>
Error 2	Opened door	If the door opens while spinning or has any trouble in the door sensor, this message may come up.	<p>Remove the dirt at the door latch and close the door completely. Check the status of door closure on the display window.</p> <p>If the error message does not disappear, please contact VWR service department.</p>
Error 3	Overheated motor	If the motor is overheated, this message may come up.	<p>Keep off the power supply for an hour and turn on the power to check up the instrument.</p> <p>If the error message does not disappear, please contact VWR service department.</p>

Error 4	Low voltage input	If the power input (V/Hz) is over 10% lower than the recommended power, this message may come up.	<p>Turn off the power supply and check the voltage of the Power supply (V/Hz). Use AVR to provide proper power.</p> <p>If the error message does not disappear, please contact VWR service department.</p>
Error 5	High voltage input	If the power input (V/Hz) is over 10% higher than the recommended, this message may come up.	<p>Turn off the power supply and check the voltage of the Power supply (V/Hz). Use AVR to provide proper power.</p> <p>If the error message does not disappear, please contact VWR service department.</p>
Error 6	Over speed	If the instrument spins faster than the set speed; over 1,000 rpm, this message may come up.	<p>Turn off and on the power supply to check the instrument. And check the speed by Tachometer if possible.</p> <p>If the error message does not disappear, please contact VWR service department.</p>
Error 7	System error	If the installed software gets any bugs or damaged, this message may come up.	Contact VWR service department.



## Ordering Information

Cat No.	Product	Capacity	Max. Speed (rpm)	Max RCF (x g)
521-1651	VWR Micro Star 12, Microcentrifuge (220V, 50/60Hz)		13,500	12,300
	includes a Fixed Angle Rotor & 12 adaptors for 0.2 ml tubes			
Rotors for VWR Micro Star 12				
	Fixed Angle Rotor with biosafety lid	12 x 1.5/2.0 ml	13,500	12,300
521-1652	PCR Rotor, for 4 x (8 x 0,2 ml) PCR strips 	32 x 0.2 ml	6,000	1,850
Adaptors for VWR Micro Star 12				
521-1653	0.2 ml Adaptor	0.2 ml/ea		
521-1654	0.5 ml Adaptor	0.5 ml/ea		

## Technical service

### Web Resources

Visit the VWR's website at [www.vwr.com](http://www.vwr.com) for:

- Complete technical service contact information
- Access to VWR's Online Catalogue, and information about accessories and related products
- Additional product information and special offers

**Contact us** For information or technical assistance contact your local VWR representative or visit.

[www.vwr.com](http://www.vwr.com)

## Warranty

VWR International warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid,

except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies.

IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

## Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorizations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorization, unless any refusal is due to a defect of the product.

## Equipment disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.

Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handing it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

## APPENDIX

### Allowable Maximum Speed

The maximum allowable speed needs to be reduced when centrifuging a solution with a density greater than 1.2 g/mL. **Failure to reduce the speed may result in damage to the rotor and centrifuge.** The revised maximum speed can be calculated with the following formula.

$$\text{Reduced speed (n}_{\text{red}}) = \sqrt{\frac{1.2}{\text{higher density value}}} \times \text{max speed (n}_{\text{max}})$$

Example:

Where the density of the liquid is 1.9, the new allowable maximum speed would be calculated as follows:

$$\text{Reduced Speed} = \sqrt{(1.2/1.9)} \times 13,500 = 10,729 \text{ rpm}$$

### RPM to RCF conversion

RPM can be converted in RCF with the following calculation.

$$\text{RCF} = 11.2 \times r (\text{RPM}/1000)^2 \text{ or } \text{RCF} = 1.12 \times 10^{-5} \times r (\text{RPM})^2$$

Example:

Where the RPM is 12,000 RPM and radius of rotor is 6 cm, Rcf would be calculated as follows:

$$\text{RCF} = 1.12 \times 10^{-5} (6)(12,000)^2 = 9.651 \times g$$

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