



Medical–Biological
Research & Technologies

Combispin FVL-2400N

Mini-Centrifuge/Vortex



Operating Manual Certificate

for versions:

V.1AB
V.1A3
V.1A12
V.1AA
V.1AC

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1. Safety Precautions

The following symbol means:



Caution!

Make sure you have fully read and understood the present Manual before using the equipment. Please pay special attention to sections marked by this symbol.

GENERAL SAFETY

- Use only as specified in the Operating Manual provided.
- The unit should be saved from shocks or falling.
- After transportation or storage keep the unit under room temperature for 2-3hrs before connecting it to the electric circuit.
- Use only cleaning and decontamination methods recommended by the manufacturer.
- Do not make modifications to the design of the unit.

ELECTRICAL SAFETY

- Connect only to electric circuit with voltage corresponding to that on the serial number label.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that the plug is easily accessible during use.
- Disconnect the unit from the electric circuit before moving.
- Disconnect the power cord plug from power socket to turn off the unit.
- If liquid penetrates into the unit, disconnect it from the electric circuit and have it checked by a repair and maintenance technician.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in section 5. Specifications.

DURING OPERATION

- Do not open the lid during work, run-up or run-down of the rotor.
- Do not operate the unit in environments with aggressive or explosive chemical mixtures. Please contact manufacturer for possible operation of the unit in specific atmospheres.
- Do not use rotors with visible signs of corrosion, wear or mechanical damage.
- Do not operate the unit if it is faulty or has been installed incorrectly.
- Do not use outside laboratory rooms.

BIOLOGICAL SAFETY

- It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or penetrates into the equipment.

2. General Information

Combispin FVL-2400N, Mini-Centrifuge/Vortex is specially designed for the genetic engineering researches (especially for PCR-diagnostics experiments). It can be used also in biochemical clinical laboratories, microbiological and industrial biotechnology laboratories.

Combi-Spin FVL-2400N ensures possibility for the simultaneous mixing and separation of samples, using centrifuge and mixing modules, located on the common spin module. Combi-Spin (the previous name Micro-Spin) was invented and for the first time described (published) by Biol. Dr. V.Bankovskis in 1989 and after the successful approbation and improvement was patented in 1994 (V.K.Bankovskis et al., Riga, Latvia, Pat. No. P94-74).

Combi-spin FV-2400N is designed for handling small quantities of liquid (micro quantity enzyme reactions mixture assembling/mixing inside the microtest tubes before the thermoincubation in dry block cooler/heater thermostats, thermal cyclers, etc.). It helps to save working space in laminar or PCR boxes.

MIX AND SPIN IN ONE COMBI-SPIN.

3. Getting started

3.1. Unpacking.

Remove packing materials carefully and retain them for future shipment or storage of the unit. Examine the unit carefully for any damage incurred during transit. The warranty does not cover in-transit damage.

3.2. Complete set. Package contents:

Standard set:

- Combispin FVL-2400N, Mini-Centrifuge/Vortex 1 pce
- spare fuse 1 pce
- **R-0.5/0.2 rotor ❶** 1 pce
- **R-1.5 rotor ❷** 1 pce
- vortex head with 2 mm eccentric ❸ 1 pce
- Operating manual, Certificate 1 copy

Optional accessories:

- **R-2/0.5 rotor ❹** on request
- **R-2/0.5/0.2 rotor ❺** on request
- **SR-16 rotor ❻** on request

❶ R-0.5/0.2



❷ R-1.5



❸ R-2/0.5



❹ R-2/0.5/0.2



❺ SR-16



3.3. Set up:

- place the unit on horizontally even working surface;
- position the unit so that there is easy access to the plug;
- according to EN 61010-2-20 people and hazardous materials must not be within a 300 mm area around the device during the centrifuge operation.

3.4. Rotor replacement:

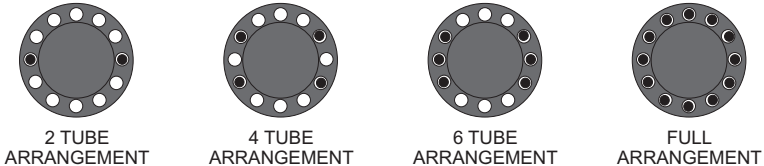
The unit is provided with the fixation mechanism for all the types of the above-mentioned rotors; operator can easily change rotor for the desired type of tubes in 3-5 s. To change a rotor (fig.1/2) hold it with one hand and turn the vortex head (fig.1/1) counterclockwise to set rotor free. Change the rotor and turn in the vortex head back.

4. Operation

Recommendation during operation



Check the rotor for any signs of wear and replace if necessary. Insert **EVEN** number of tubes in rotor one opposite another. The opposite tubes must be filled equally.



- 4.1. Connect unit to a properly grounded power socket.
 - 4.2. Operation in the quick centrifugation mode:
 - 4.2.1. Turn the switch (Fig. 1/4) into position I (**QS**, Quick Spin).
 - 4.2.2. Open the lid and place **EVEN** number of tubes to the rotor sockets (Fig.1/2) opposite one another. Close the lid.
 - 4.2.3. Press the **QS** (Fig. 1/3) button for quick mixing / sedimentation and hold it pressed for the desired time. The unit will automatically when the **QS** button is released.
-  **Note!** Do not open the lid during work, run-up or shutoff of the rotor. The unit stops automatically when the lid is open.
- 4.2.4 Turn the switch (Fig. 1/4) into position O (OFF).
 - 4.3. Operation in the vortex mode:
 - 4.3.1. Turn the switch (Fig. 1/4) into position I (**QS**).

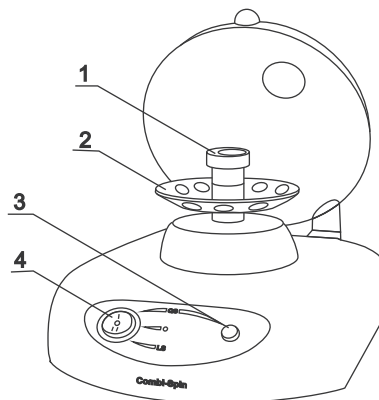


Fig.1 General view

4.3.2. Gently holding a tube with fingers at its upper part press the tube's lower part to the vortex head cavity bottom (Fig. 1/1).

4.3.3. Press **QS** button for mixing and hold it pressed till full sediment dissolution.



Caution! Remember that the angle of hydrodynamic shift as well as the force of tubes pressing to the vortex head are decisive factors of sediment dissolution effectiveness.

To avoid fast erase of vortex head and plastic tube's surfaces don't press tubes to the vortex head too strong.

4.3.4. Turn the switch (Fig. 1/4) into position O (OFF).

4.4. Operation in the long centrifugation mode:

Operation in the long centrifugation mode (for more than 1 min) is used for blood and eucariotics cells sedimentation (including micro-organism cells), dissolving of hardly soluble components or salts dense sediments in analytical research, etc.

4.4.1. Open the lid and place EVEN number of tubes to rotor sockets (Fig. 1/2) opposite one another. Close the lid.

4.4.2. Turn the switch (Fig. 1/4) into position II (**LS**, Lon Spin) to start centrifugation.

4.4.3. Turn the switch into position O (OFF) to stop centrifugation.

4.5. Disconnect unit from electric circuit.

5. Specifications

The unit is designed for operation in cold rooms, incubators and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

- 5.1. Fixed rotation speed 2800 rpm (50 Hz); 3500 rpm (60 Hz)
5.2. Acceleration time to max. speed 5 s
5.3. Maximum continuous operation time. 60 min
5.4. Dimensions 190x235x125 mm
5.5. Operating voltage / power consumption 230 V; 50 Hz; 30 W (0.13 A),
230 V; 60 Hz; 25 W (0.1 A) or 120 V; 50/60 Hz; 30 W (0.27 A)
5.6. Weight* 1.7 kg

* Accurate within $\pm 10\%$.

Optional accessories	Description	Catalogue number
R-2/0.5 rotor	for 8x2 ml and 8x0.5 ml microtest tubes	BS-010205-CK
R-2/0.5/0.2 rotor	for 6x2 ml, 6x0.5 ml and 6x0.2 ml microtest tubes	BS-010205-DK
SR-16 rotor	for 2 strips of 8x0.2 ml microtest tubes	BS-010202-AK

Replacement parts	Description	Catalogue number
R-1.5 rotor	for 12x1.5 ml microtest tubes	BS-010205-AK
R-0.5/0.2 rotor	for 12x0.2 ml and 12x0.5 ml microtest tubes	BS-010205-BK
Vortex head	Vortex head with 2 mm eccentric	BS-010202-S13

Biosan is committed to a continuous programme of improvement and reserves the right to alter design and specifications of the equipment without additional notice.

6. Maintenance

- 6.1. If the unit requires maintenance, disconnect the unit from the electric circuit and contact Biosan or your local Biosan representative.
- 6.2. All maintenance and repair operations must be performed only by qualified and specially trained personnel.
- 6.3. Standard ethanol (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and disinfection of the unit.
- 6.4. Fuse replacement. Disconnect the unit from electric circuit. Open the fuse holder located on rear side of the device by turning its cover counter-clockwise. Replace with the correct fuse (250 mA for 230 V or 500 mA for 120 V).

7. Warranty and Claims

- 7.1. The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 7.2. The warranted service life of the unit from the date of its delivery to the Customer is 24 months. Contact your local distributor to check availability of extended warranty.
- 7.3. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment claim shall be compiled, certified and sent to the local distributor address. Please visit www.biosan.lv, Technical support section to obtain the claim form.
- 7.4. The following information will be required in the event that warranty or post-warranty service comes necessary. Complete the table below and retain for your records.

Model	Combispin FVL-2400N Mini-Centrifuge/Vortex
Serial number	
Date of sale	

8. Declaration of Conformity

Declaration of Conformity

Equipment name:	FVL-2400N Combispin
Type of equipment:	Mini-Centrifuge/Vortex
Directive:	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC RoHS 2011/65/EC WEEE 2002/96/EC & 2012/19/EU
Manufacturer:	SIA BIOSAN Ratsupites 7, build.2, Riga, LV-1067, Latvia
Applied Standards:	EN 61326-1: Electrical equipment for measurement, control and laboratory use EMC requirements. General requirements EN 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements EN 61010-2-20: Particular requirements for laboratory centrifuges

We declare that this product conforms to the requirements of the above Directive(s)



Signature
Svetlana Bankovska
Managing director



Signature
Aleksandr Shevchik
Engineer of R&D

12.06.2013

Date

12.06.2013

Date

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