

Grant-bio

Centrifuge/Vortexer Combi-spin PCV-2400

Operating instructions



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1. Safety

1.1 Caution symbol



This symbol means **Caution – risk of danger**

Where this symbol appears on the centrifuge, consult these operating instructions - the relevant passages in the instructions have the symbol marked beside them.

1.2 Safety features

The PCV-2400 is constructed so as to meet the requirements of international safety standard IEC 61010-2-020: Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-020: Particular requirements for laboratory centrifuges, and national standards based on it, including:

EN 61010-2-020;
BS EN 61010-2-020;

A copy of the Declaration of Conformity with CE requirements is included at the back of this manual.

Particular safety features include:

- A microswitch that prevents the centrifuge motor from being started while the lid is open;
- An interlock that prevents the lid from being opened until the rotor has slowed down.

1.3 Before first operating the centrifuge

- ☞ Read the whole of these instructions, paying particular attention to sections marked with the Caution symbol. Safety may be impaired if these instructions are not followed.
- ☞ If the centrifuge has been transported or stored in cold or humid conditions, condensation may form inside it. If that could have happened, allow time for the condensation to evaporate before using the centrifuge. Safety may be impaired if the centrifuge is switched on before the condensation has evaporated.
- ☞ Mount the centrifuge on a surface that is flat, level and firm ensuring that the sucker feet grip the surface.
- ☞ Connect the centrifuge to a power supply with the correct voltage and frequency, as marked on the serial number label, and with an earth (ground) connector.
- ☞ Make sure that the mains switch and power supply plug are easily accessible during use.

1.4 Precautions during and after operation



Always install microtubes into the spin plate so that the load is balanced - an unbalanced load can cause vibration.



Do not open the lid while rotor is still spinning.



Do not use with a load heavier than 0.2 kg.



Do not use the centrifuge in an area where there are aggressive or explosive chemical mixtures.



If liquid is spilt inside the centrifuge, disconnect it from the power supply and have it checked by a competent person.



Clean the centrifuge with a damp cloth, using water only. In particular ensure that the sucker feet are kept clean. Do not use chemical cleaning agents. Standard ethanol (75%) can be used for disinfection. Before using any other cleaning or decontamination method, check with the manufacturer or supplier to make sure that the proposed method will not damage the equipment.



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



If the centrifuge is to be moved, disconnect the plug from the power supply socket.

2. General Information

The Centrifuge/Vortexer PCV-2400 is specially designed for life science research. It can be used in biochemical, microbiological and industrial biotechnology laboratories.

The PCV-2400 makes it possible to centrifuge a batch of samples and at the same time mix other samples using the vortex head, which is driven by the same drive shaft as the centrifuge.

The PCV-2400 is designed for handling small quantities of liquid. Examples include micro quantity enzyme reactions; mixing in microtubes prior to incubation, and in dry block heaters and coolers. It can help to save working space in laminar flow or PCR boxes.

3. Getting started

3.1 Unpacking

Remove packing materials carefully, and retain for future shipment or storage of the centrifuge.

3.2 PCV-2400 standard equipment includes:

- Centrifuge/Vortexer PCV-2400 1 piece
- Spin plate for 12 x 1.5 or 2 ml microtubes 1 piece
- Spin plate for 12 x 0.5 ml + 12 x 0.2 ml microtubes 1 piece
- Vortex module 1 piece
- Fuse 1 piece
- Operating Manual, including CE Certificate 1 copy

3.3 Optional extras:

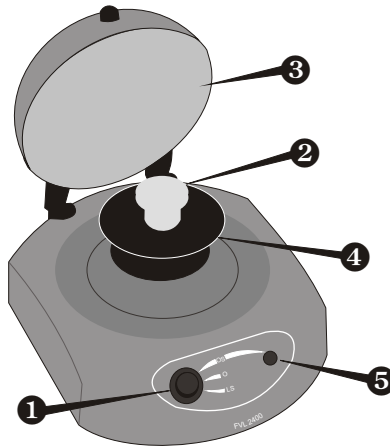
- Spin plate for 8 x 1.5 or 2 ml + 8 x 0.5 ml microtubes
- Spin plate for 6 x 1.5 or 2 ml + 6 x 0.5 ml + 6 x 0.2 ml microtubes
- Spin plate for 2 x 8-well 0.2 ml microtube strips

3.4 The spin plate is held in place by the vortex head.

The operator can easily fit a spin plate in a few seconds, or change a spin plate to use different tubes.

To change a spin plate (④), hold it with one hand and unscrew the vortex head (②) to release it (see picture on the following page). Change the spin plate, replace the vortex head, and screw it up.

4. Operation of PCV-2400

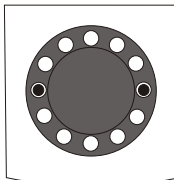


4.1 Operation in the QUICK CENTRIFUGATION MODE:

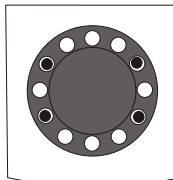
4.1.1 Connect the centrifuge to the power supply.



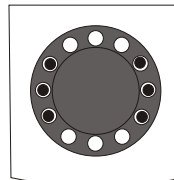
4.1.2 Open the lid (3) and install an EVEN number of tubes in rotor sockets (4), facing one another so as to make a balanced load, as shown below. An unbalanced load may cause vibration.



2 TUBE
ARRANGEMENT



4 TUBE
ARRANGEMENT



6 TUBE
ARRANGEMENT

- 4.1.3 Close the lid. The motor will not start unless the lid is closed.
- 4.1.4 Turn the switch (1) into position I. (QUICK SPIN).
- 4.1.5 Press the Quick Spin button (5) for quick mixing or sedimentation, and hold for the desired time. The motor will stop automatically when the Quick Spin button is released.
- 4.1.6 The safety interlock will prevent the lid from being opened until the rotor has slowed down.

4.2 Operation in the VORTEX MODE:

- 4.2.1 Close the lid. The motor will not start unless the lid is closed.
- 4.2.2 Turn the switch (1) into position I (QUICK SPIN).
- 4.2.3 Gently holding a tube near the top with two fingers, press the lower part of the tube lightly onto the cone shaped recess of the vortex head (2).
- 4.2.4 Press the Quick Spin button (5), and hold the tube against the vortex head until homogenisation is complete. Vortexing power will depend on the angle at which the tube is pressed against the vortex head, and the force, but there is no need to press hard.



Do not open the lid while rotor is still spinning.

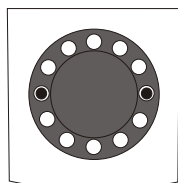
4.3 Operation in the LONG CENTRIFUGATION MODE:

Long Spin operation is used for sedimentation taking more than a minute. Examples include:

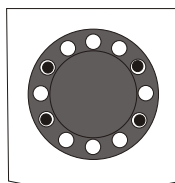
- blood and eucaryotic cells samples, including micro-organism cells;
- dissolving partially-soluble components or salts;
- dense sediments in analytical research.



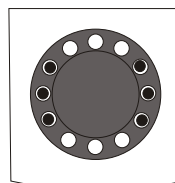
- 4.3.1 Open the lid (3) and install an EVEN number of tubes in rotor sockets (4), facing one another so as to make a balanced load, as shown below. An unbalanced load may cause vibration.



2 TUBE
ARRANGEMENT



4 TUBE
ARRANGEMENT



6 TUBE
ARRANGEMENT

- 4.3.2. Close the lid. The motor will not start unless the lid is closed.
- 4.3.3 Turn the switch (1) into position II (LONG SPIN).
The lid cannot be opened while the switch is in position II.
- 4.3.3 To stop the centrifugation process, turn the switch to the 0 (OFF) position.
- 4.3.4 Do not open the lid while rotor is still spinning.



5. Specifications

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- **Rotation speed (constant)**.....2 800 r.p.m. (50 Hz)
3 500 r.p.m. (60 Hz)
 - **Centrifugal force**
 - for 0.5, 1.5 and 2 ml tubes 350 g (50 Hz)
550 g (60 Hz)
 - for 0.2 ml tubes 320 g (50 Hz)
500 g (60 Hz)
 - **Maximum continuous operation time**60 min
 - **Number of sockets standard spin plates**
 - for 1.5 or 2 ml tubes12
 - for 0.5 & 0.2 ml tubes12 of each size
 - for 1.5 or 2 ml & 0.5 ml tubes8 of each size
 - **Number of sockets in special spin plates**
 - for 1.5 or 2 ml, 0.5 ml & 0.2 ml tubes6 of each size
 - for 8-well 0.2 ml microtube strips2
 - **Voltage**230V, 50-60 Hz
(Centrifuges are for one voltage only)110V, 50-60 Hz
 - **Power**.....30 W
 - **Dimensions**190x235x125 mm
 - **Weight**.....2.1 kg
 - The product is designed for operation in closed laboratory rooms at ambient temperature from +5°C to +40°C and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

6. Maintenance

6.1 Cleaning and Disinfection

Clean the centrifuge with a damp cloth, using water only. In particular ensure that the sucker feet are kept clean. Do not use chemical cleaning agents. Standard ethanol (75%) can be used for disinfection. Before using any other cleaning or decontamination method, check with the manufacturer or supplier to make sure that the proposed method will not damage the equipment.

6.2 Routine maintenance and inspections

There are no user-serviceable parts inside the unit. For all maintenance and repairs (except as defined below) return to our service department in the UK or in other countries, our distributor.

6.1.2 Maintenance

Inspect the spin plate and vortex head for mechanical damage/wear. Worn or damaged parts should not be used and must be replaced. Replacement spin plates and vortex heads can be obtained from Grant, but wear/damage to the centrifuge drive shaft will necessitate its return to Grant, or its agent, for repair.

6.1.3 Routine Safety checks

If routine tests are to be made, we recommend a test of the integrity of the protective earth conductor and an insulation test at 500 Vdc. Routine flash tests are not recommended for any electrical equipment, because repeated high voltage tests degrade insulation materials.

Values for tests:

Earth continuity 0.1 Ohm max.

Insulation resistance 10 M Ohm min.

6.1.4 Fuse replacement

The fuse holder is located at the rear of the centrifuge. To replace the fuse, unscrew the holder and replace the fuse.

Fuse ratings

240V centrifuge.....20mm x 5mm, F250mA (250V~)

110V centrifuge.....20mm x 5mm, F500mA (250V~)

7. Guarantee and Service

7.1 **Guarantee**

When used in laboratory conditions and in accordance with these working instructions, this centrifuge is guaranteed for TWO YEARS against faulty materials or workmanship.

7.2 **Service**

Equipment requiring repair should be sent to our Service Department in the UK or in other countries to our distributor.

Declaration of Conformity

Manufacturer:-	GRANT INSTRUMENTS (CAMBRIDGE) LTD, Shepreth, Cambridgeshire SG86GB
Equipment name/type number:-	PCV-2400
Description of Equipment:-	Centrifuge/Vortexer Combi-spin
Directives:-	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC

I confirm that this apparatus conforms to the requirements of the above Directive(s)

Applied Standards:-	
Harmonized Standards:-	<u>EN 61326:</u> Electrical equipment for measurement, Control and laboratory use - EMC requirements <u>Part 1:</u> General requirements <u>EN 61010:</u> Safety requirements for electrical equipment for measurement, control and laboratory use. <u>Part 1:</u> General requirements <u>Part 2-020:</u> Particular requirements for laboratory centrifuges.

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