



Centrifuge/Vortex for PCR plates MSC-2P

Operating Manual

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1. About this edition of user instructions

1.1. The current edition of the user instructions applies to the following models:

Model and name	Version
MSC-2P , Centrifuge/Vortex for PCR plates	V.1GW

1.2. Edition 1.01 – November of 2024.

2. Safety precautions



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.

2.1. Icons used on the unit and packaging

	CE marking, manufacturer affirms conformity with European health, safety, and environmental protection standards, see section Compliance
	WEEE directive marking, see section Compliance
	UK Conformity Assessed marking, see section Compliance
	Polarity of the power connector
	Equipment uses direct current
	Emergency opening location, see 5.15

2.2. General safety

- The protection provided can be ineffective if the operation of the appliance does not comply with the manufacturer's requirements.
- Save the unit from shocks and falling.
- Store and transport the unit as described in section **Storage and transportation**.
- Use only original parts and accessories, provided by manufacturer for this product.
- Before using any cleaning or decontamination methods except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment.
- Do not make modifications in design of the unit.

2.3. Electrical safety

- Connect only to the mains with voltage and frequency corresponding to that on the serial number label.
- Use only the external power supply provided with the unit.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that the power plug is easily accessible during use.
- Disconnect the unit from the mains before moving.
- If liquid penetrates the unit, disconnect it from the mains 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 **Specifications**.

2.4. During operation

- 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 operate the unit if it is faulty or has been installed incorrectly.
- Do not use outside laboratory rooms.
- Do not leave the operating unit unattended.
- Do not fill in the tubes after they are inserted in the rotor.
- Do not use rotors with visible signs of corrosion, wear, or mechanical damage.
- Observe the safety area of 300 mm around the unit. Personnel and hazardous materials must not be located in the safety area whilst the unit is operating.
- Do not centrifuge flammable or chemically active substances. If such liquids are spilled on the rotor or rotor chamber, the centrifuge must be cleaned with a moist cloth and a mild soap solution.

2.5. Biological safety

- According to EN 61010-2-20, a centrifuge without a lid gasket is not considered a biologically safe system and therefore cannot be used for centrifuging hazardous materials contaminated with toxic, radioactive, or pathogenic microorganisms.
- The user is responsible to carry out appropriate decontamination if hazardous material spills on or penetrates into the equipment.

3. General information

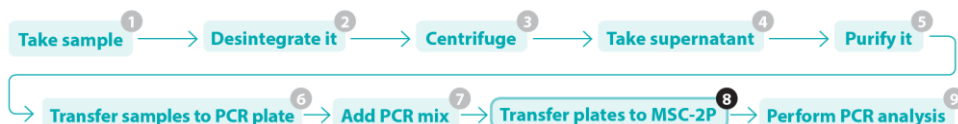
MSC-2P is a compact sized digital centrifuge intended to collect droplets, mix reagents and collect once more for improved PCR yield in subsequent analysis. The combination of spin-mix functions ensures fast operation, thorough mixing and repeatable results. Centrifuge rotor can accommodate 2 PCR plates at the same time, thus saving time considerably.

MSC-2P is possible to operate in 4 independent modes:

- Centrifuge — max. 3500 RPM
- Vortex
- Centrifuge/Vortex — combined two motion types
- Spin-mix-spin algorithm — up to 10 cycles

The spin-mix-spin algorithm (SMS-algorithm) is designed to collect (or reset) micro volumes of reagents to the bottom of the PCR plate tubes (the first centrifugation or spin), then vortexing (mix) and re-collecting reagents (repeated spin) from the walls and cover. This repetitive algorithm of operations, aimed at reducing sample preparation errors, we call the SMS algorithm.

Place of centrifuge/vortex MSC-2P in sample preparation stages for PCR analysis



4. Getting started

4.1. **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. Warranty covers only the units transported in the original package.

4.2. **Complete set.** Package contents:

4.2.1. Standard set:

- Centrifuge/vortex 1 pce.
- External power supply and power cable 1 pce.
- MSC-2P-1, adapters for non-skirted plates..... 2 pcs.
- MSC-2P-2, adapters for non-skirted plates..... 2 pcs.
- Operating Manual..... 1 copy



Note.

The detachable rotor is an integral part of the unit. It has no design modifications and is meant only for MSC-2P model.

4.3. **Setup.**

- Place the unit upon even horizontal stable non-flammable surface 30 cm away from any flammable materials, and clear 20 cm around the device on all sides for ventilation.



Note.

Regularly clean support suction feet for improvement of their adhesion with desk surface.

- Remove the protective film from the display.
- Connect the power cable to the external power supply.
- Connect the power cable to the socket on the rear side of the unit and position it with easy access to the power switch and 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.

5. Operation

5.1. Recommendations during operation

- Check the rotor for any signs of wear and replace if necessary.
- Insert both PCR plates in the rotor. The opposite tubes must be filled equally.
- Do not use unsealed PCR plates.

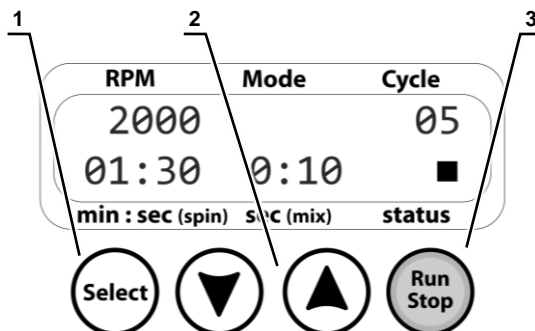


Figure 1. Control panel

5.2. Connect the external power supply to the grounded mains socket. Turn on the power switch (I position) on the rear side of the unit. Display lights up and the lid unlocks automatically.

5.3. Lift the lid and remove the safety bracket by pulling on the knob in the centre.

5.4. Insert sealed PCR plates with the sealed cells towards the centre in both of the rotor sockets.



Note. If the plates move freely inside the rotor, use the included adapters **MSC-2P-1** or **MSC-2P-2** for a better fit. Unsecured plates may cause damage to the samples or the unit during operation!

5.5. Place the safety bracket and press down the centre knob to secure the plates.



Caution! Do not start operations without the safety bracket in place!

5.6. Close the lid.

5.7. **Parameter setting.** Press the **Select** key (fig. 1/1) to enter the parameter setting mode. Each consecutive press of the **Select** key sequentially activates parameters in cycle. The active parameter will be blinking. Use **▲** and **▼** keys (fig. 1/2) to set the necessary value. Pressing the key down longer than 2 s will make the values change quicker.

5.8. **Setting an SMS-algorithm** (figure 2). Enter the parameter setting mode and set the following parameters:

- Centrifugation speed, from 500 to 3500 rpm.
- Centrifugation time, from 1 second to 10 minutes.
- Vortexing time, from 1 second to 5 minutes.
- Cycle count, from 1 to 10. A cycle consists of centrifugation at set speed for set time, then vortexing for set time. Cycle count is the number of cycle repetitions during the operations.

5.9. **Setting only centrifugation** (figure 3). Enter the parameter setting mode and set the following parameters:

- Centrifugation speed, from 500 to 3500 rpm.
- Centrifugation time, from 1 second to 10 minutes.
- Vortexing time must be set below 1s, indication OFF.
- Cycle count (value in grey) can be any value as it is not used in this operation.

5.10. **Setting only mixing** (figure 4). Enter the parameter setting mode and set the following parameters:

- Centrifugation speed (value in grey) can be any value as it is not used in this operation.
- Centrifugation time must be set below 1s, indication OFF.
- Vortexing time , from 1 second to 5 minutes.
- Cycle count (value in grey) can be any value as it is not used in this operation.



Figure 2.



Figure 3.



Figure 4.

5.11. **Running the operations** (figure 5). To start the operations, press the **Run Stop** key (fig. 1/4):




- Lid locks as indicated by the  status icon.
- Status icon changes from  to .
- If used, set centrifugation speed changes to actual values, increasing as the rotor spins up.
- Rotor reaches the set speed, then the corresponding timer starts the countdown.




Figure 5. Display during an SMS-algorithm operation.

5.11.1. For the SMS-algorithm, operations continue until the cycle count reaches 00. The unit then performs a final centrifugation with set parameters before stopping.

5.11.2. For centrifugation or vortexing, operations continue until the corresponding timer counts down to 0:00, then stops.

5.11.3. The program can also be changed during operation. Unit automatically applies the last changes on the new cycle of the program.

5.12. After the operations are finished, the unit stops. Display shows blinking icon , accompanied by a sound signal. Press the **Run Stop** key to stop the signal. Lid unlocks after the rotor stops completely.

5.12.1. If necessary, operation can be stopped at any time by pressing the **Run/Stop** key.

5.13. Unit saves the parameters even in unpowered state. To repeat operation with the set parameters, press the **Run Stop** key.

5.14. At the end of operation set the power switch in position **O** (OFF) on the rear. Disconnect the external power supply from electric circuit.



Note.

The electrical lid lock allows opening the lid only when the unit is connected to the mains and is turned on.

5.15. **Lid emergency opening.** Disconnect the power cord from external power supply unit. Wait until the rotor stops completely. Insert the provided lid unblocking key (found on the rear panel of the unit) into the marked opening on the right side of the unit, push the key with one hand and lift the lid with the other.

6. Specifications

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

6.2. Rotation specifications

Capacity	2 PCR microplates
Centrifugation mode	500–3500 RPM
Relative centrifugal force	Up to 610g
Centrifugation timer	1 s – 10 min, step 1 s
Vortexing mode	Full rotor
Vortexing timer	1 – 5 min, step 1 s
SMS-cycle regulation	1 – 10 cycles
Operation, maximum	150 minutes



Caution! After an extended operation, allow the minicentrifuge to cool down for 1 h before resuming.

6.3. General specifications

Tube protection	Lid lock
Display	LCD, 2x16 symbols
Dimensions, mm (WxDxH)	165x220x230
Weight, accurate within $\pm 10\%$	2.7 kg
Power consumption, W	18
Input voltage	100–240 V~, 50–60 Hz
External power supply	12 V=, 2 A

6.4. Workroom requirements

Workroom description	Cold rooms, incubators (except CO ₂ incubators) and closed laboratory rooms
Temperature range	+4 °C ... +40 °C
Humidity requirements	Maximum of 80% RH at 31 °C, decreasing linearly to 50% RH at 40 °C. Non-condensing atmosphere.
Operating height, maximum	2000 m ASL
Overvoltage category	II
Pollution degree	2

7. Ordering information

7.1. Models and versions available:

Model	Version	Description
MSC-2P	V.1GW	100–240 V, 50–60 Hz

7.2. To inquire about or order the optional accessories or the replacement parts, contact Grant or your local Grant representative.

8. Guarantee and service

8.1. When used in laboratory conditions and according to this working manual, this product is guaranteed for TWO YEARS against faulty materials or workmanship. For full details of the Grant Bio Warranty policy, please contact Grant Instruments.

8.2. Service.

8.2.1. If the unit is disabled (e.g., no centrifugation or vortexing, no reaction to key presses, etc) or requires maintenance, disconnect the unit from the mains and contact Grant or your local Grant representative.

8.2.2. All maintenance and repair operations (except listed below) must be performed only by qualified and specially trained personnel.

8.2.3. Operating integrity check. If the unit follows the procedure described in section **Operation**, then no additional checks are required.

8.3. Cleaning and disinfection.

8.3.1. Use mild soap and water with a soft cloth or sponge for cleaning the exterior. Rinse remaining washing solution with distilled water. Wipe dry the excess water with clean, soft cloth or sponge.

8.3.2. Regularly clean support suction feet for improvement of their adhesion with desk surface.

8.3.3. To disinfect the plastic parts, use 75% ethanol or DNA/RNA removing solution (e.g., Grant PDS-250). After disinfecting it is necessary to wipe the surfaces dry.

8.3.4. The rotors and adapters are autoclavable, at 120°C, for 20 min. The unit itself is not autoclavable.

8.4. **Disposal.** Disposal of the appliance requires special precautions and must be carried out at an appropriate disposal site, separate from normal household waste. To prevent pollution of the environment, all waste resulting from the disposal of the product must be collected and disposed of in the country of use, in accordance with the applicable requirements for the handling of electronic waste.

9. Storage and transportation

9.1. Store and transport the unit in a horizontal position (see package label) at ambient temperatures between -20°C and +60°C and maximum relative humidity of 80%.

9.2. After transportation or storage and before connecting it to the electric circuit, keep the unit under room temperature for 2-3 hrs.

9.3. For extended storage, the unit does not require special procedures.

EU Declaration of Conformity

All the products covered by this Manual comply with the requirements of the EU harmonised legislation verified using the following standards

Low Voltage Directive (2014/35/EC) for Electrical safety.	LVS EN 61010 Part 1 LVS EN 61010 Part 2-020
EMC directive (2014/30/EC) for Electromagnetic compatibility	LVS EN 61326-1
RoHS Directive (Directive 2011/65/EC including 2015/863) for Hazardous substances	LVS EN 50581

UK Declaration of Conformity

All the products covered by this Manual comply with the requirements of UK statutory requirements verified using the following standards.

Electrical Equipment (Safety) Regulations 2016	BS EN 61010 Part 1 BS EN 61010 Part 2-020
Electromagnetic Compatibility Regulations 2016	BS EN 61326-1
The Restriction of the Use of Certain Substances in Electrical and Electronic equipment Regulations 2012	BS EN 50581

Waste Electrical and Electronic Equipment (WEEE)



All the products covered by this Manual are marked with the crossed-out wheelie bin symbol indicating they must not be disposed of with unsorted waste. Safe recycling of WEEE helps conserve natural resources and protect human health.

Grant Instruments complies fully with the UK Waste Electrical & Electronic Equipment (WEEE) regulations 2013. We are a member of the B2B compliance scheme (Scheme Approval Number WEE/MP3338PT/SCH), which handle our WEEE obligations on our behalf. Grant Instruments have been issued with a unique registration number by the Environmental Agency, this reference number is WEE/GA0048TZ.

For information regarding WEEE collections in the UK please contact our B2B Compliance Scheme directly on 01691 676 124 or www.b2bcompliance.org.uk

In the EU, Grant Instruments complies with WEEE Directive 2012/19/EU.

Contact your local equipment supplier for WEEE collections.

REACH Regulations

This product does not contain any Substances of Very High Concern (SVHCs) at greater than 0.1% that have to be identified in accordance with Regulation (EC) No 1907/2006 and therefore does not have an entry in the SCIP database.

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