

Instruction Manual

Digital Centrifuges 2650

Models 2650-D (code GBF011) and 2650-D+ (code GBF012)



Thank you for choosing this equipment. We highly recommend looking after this equipment according to what is stated in this manual.

Nahita Blue develops its products according to the CE marking regulations as well as emphasizing the ergonomics and security for its user.

The correct using of the equipment and its good quality will permit you to enjoy this equipment for years.

The improper use of the equipment can cause accidents and electric discharges, circuit breakers, fires, damages, etc. Please read the point of *Maintenance*, where we expose the security notes.

TO GET THE BEST RESULTS AND A HIGHER DURATION OF THE EQUIPMENT IT IS ADVISABLE TO READ THOROUGHLY THIS MANUAL BEFORE OPERATING WITH THE EQUIPMENT.

Please bear in mind the following:

- This manual is inseparable from the digital centrifuges Nahita Blue, so it should be available for all the users of this equipment.
- Follow all required **applicable laws about safety and health** (electrical security devices, inflammable, toxic and/or pathological products, etc.).
- You should carefully handle the digital centrifuges avoiding sudden movements, knocks, free fall of heavy / sharp objects on it. Avoid spilling liquids inside the equipment.
- Never dismantle the different pieces of the digital centrifuges to repair it yourself, since it could produce a defective use of the whole equipment and a loss of the product warranty, as well as injuries on people that handle the centrifuges.
- To prevent fire or electric discharges avoid dry or dusty environments. In case it may happen unplug the equipment immediately.
- If you have any doubt about setting up, installation or functioning do not hesitate in contacting your wholesaler. You can also tell us any doubts or suggestions you have by contacting Technical Assistance Department by email to (asistencia@auxilab.es).
- This equipment is protected under the warranties and consumer goods regulation (10/2003).
- Overhaul is not covered by the centrifuges warranty.
- Operations made by non-qualified staff will automatically produce a loss of the centrifuges warranty.
- Neither fuses nor accessories (including their loss), are covered by the product's warranty. The warranty neither covers piece's deterioration due to the course of time.
- Please make sure you keep the invoice, either for having the right to claim or asking for warranty coverage. In case you have to send the equipment to Technical Assistance Department you should enclose the original invoice or a copy as guarantee.
- Manufacturer reserves the right to modify or improve the manual or equipment.

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1. USES OF THE APPARATUS

Compact and sturdy design centrifuges that can be used in different types of laboratories. Two digital models: one that uses a motor with brushes (2650-D) and the other with induction (brushless) motor, maintenance free (2650-D+).

There are some examples of different activities in which these centrifuges are used as a technique of separation:

- a) Separation of serum or plasma.
- b) Cell concentration.
- c) Separation of suspensions.
- d) Biochemical research.

2. BASIC THEORY

The centrifuge is an apparatus that provides a technique of separation that is based on the movement of the particles. In this way the particles are moved towards the end of the rotating axis depending on their different masses and shapes.

The Relative Centrifuge Force (RCF) is the required force so that the separation can be carried out. The units of this force are expressed in number of times higher than the gravity (g).

The RCF is calculated by means of the following formula:

$$RCF = 1,118 * 10^{-5} * r * n^2$$

Being $1,118 * 10^{-5}$ a constant.

r = twisting radius, horizontal distance in centimeters from rotation axis up to the bottom of the tube (see figure 1).

n = rotation speed expressed in revolutions per minute (rpm).

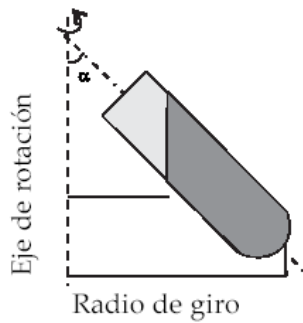
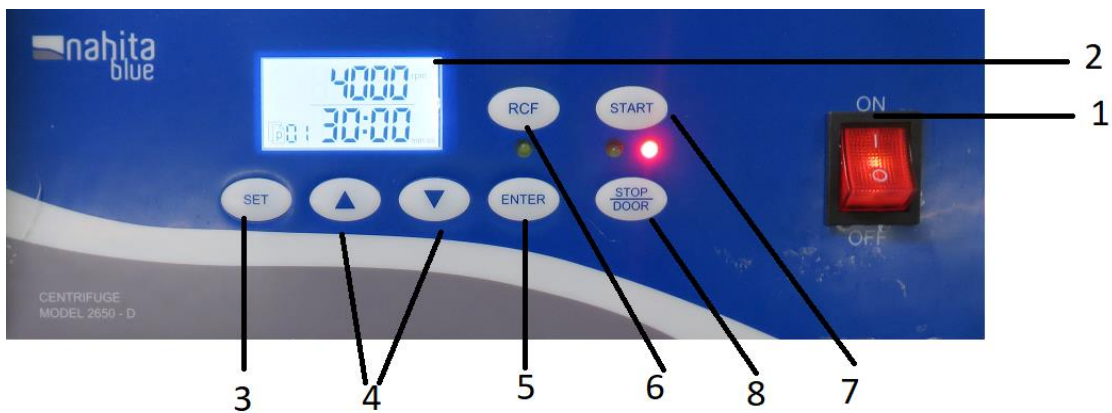


Figure 1

3. CONTROL PANEL



1. ON/OFF switch
2. Backlit LCD display
3. SET key for speed and time adjustment
4. Keys to increase (\blacktriangle) and decrease (\blacktriangledown) the parameter value
5. ENTER key to confirm the set value of the parameter
6. RCF key to display the relative centrifugal force
7. START key to initiate centrifugation
8. STOP/DOOR key to stop centrifugation and open the lid

4. TECHNICAL SPECIFICATIONS

Model	2650-D	2650-D+
Code	GBF011	GBF012
Control	Digital	
Rotor	Angular, 45° inclined, painted aluminum	
Speed range	500 - 4000 rpm (50 rpm increment)	
Max. FCR	2300xg (10xg increment)	
Capacity	12 x 15 mL (Falcon type tubes) Using the tube adapter code GBK003 Vacutainer tubes of 13x75 mm and 13x100 mm can be centrifugated (removing the cushion for 13x100 mm tubes)	
Timer	10 sec – 99 min 59 sec	
Display	Backlit LCD	
Motor	With brushes	Brushless, maintenance free
Power supply	220V/50Hz	
Weight	9.75 kg	
Dimensions	330 x 285 x 270 mm	

5. INSTALLATION / OPERATION

Preliminary inspection

- Unwrap the centrifuge, take off the involving plastic and take off the poliespan protection in which it comes fitted.
- Please make sure that it does not present any damage because of the shipment. If it does please communicate to your distributor immediately, so that they can make the claims in the correct time limit.

We will only accept any equipment return within 15 days after delivery and provided it comes in its original package and with all accessories and documents supplied

Please check that all the accessories are enclosed with the equipment:

- Tube holders
- Schuko standard wire
- Instruction manual

Installation

Before using this equipment, it is convenient for you to familiarize with its components and basic essentials.

- Put the centrifuge on top of a horizontal and stable table, making a free space of at least 30 cm per side.
- Do not put the centrifuge near any warm supply (burners, blowlamps...), nor expose it directly to the sun, etc.
- FORBIDDEN the presence of flammable (gas and liquid) and toxic products in the workplace.
- The apparatus is supplied with a Schuko standard wire. Please insert the wire that feeds the AC electric current in the power outlet 220V/50Hz provided with grounding and the other end to the centrifuge connector.

Neither the manufacturer nor the distributor will assume any responsibility for the damages produced to the equipment during its installation or damages to persons suffered by the improper use of the electric connection. The voltage should be 220V/50Hz.

Operation

- Place the tubes in the tube holders and close the lid.

IMPORTANT: Make sure that the sample tubes are placed in symmetrical positions and that tubes are of equal weight to avoid serious shaking.



- Turning ON the centrifuge:

Turn on the ON/OFF switch; the light is lit to indicate that the power is connected. Adjust the speed and working time with the keys SET, ▲, ▼ and ENTER.

- Functioning:

Once selected speed and time press START key to initiate centrifugation; the lid automatically locks until the end of process.

- Stop:

Once the working time is spent the motor shuts down; when rotor stops the electromagnetic lock unlocks to open the lid and a sound signal is heard. If you need to interrupt the run press the STOP/DOOR key.

Security

- The centrifuge must be operated by previously trained persons.
- Don't centrifuge flammable liquids, explosive samples or substances capable of forming explosive mixtures.
- Avoid vibrations, dust and very dry environments.
- When you are not using the centrifuge for a long period of time please make sure it is unplugged in order to avoid possible accidents.
- **It is essential to have the equipment switched off and unplugged from the net** before cleaning, checking components or replacing any piece (e.g. replacement of a fuse).
- Made under the European regulations for electrical security, electromagnetic compatibility and security on machines.

6. MAINTENANCE AND CLEANING

To get best results and a higher duration of this equipment it is essential to follow some recommendations.

- Please follow the instructions given in this manual.
- This manual should be available for all users of the equipment.
- Always use original components and supplies. Other devices can be similar, but they can damage the equipment.
- The centrifuge is supplied with a Schuko standard cable; it should be connected to power outlet provided with grounding and be accessible to be disconnected in case of emergency.
- Use tubes that are resistant to the RCF.
- Balance the centrifuge placing tubes that are equal in weight, shape and size in symmetrical positions. If it is necessary, use tubes filled with water when one of the holes is empty. In a centrifuge it is very important the concept of weight, then it is advisable to have a balance to adjust the weights of the different tubes.
- This is absolutely necessary since if the rotor is not well balanced it can produce shakings, if these shakings are small it is difficult to notice them, then little by little

the centrifuge wears away and then the breaking of the tube holders increases and it produces a worse sedimentation. It is advisable to change all the tube holders at the same time.

- Do not stop the centrifuge by the application of any external force, in this way you will avoid the possible mixture of the separate parts and the risk of accident and wear.
- The motor with brushes has a useful life of approximately 2000 hours. Do not replace the brushes yourself, contact your distributor.
- In the event of breakdown please contact your distributor to overhaul through the Technical Assistance Service.

Cleaning

- For cleaning metallic parts never use scourers or substances that can grate, as they damage the centrifuges and produce an early ageing of the equipment.
- Use a fluff-free cloth dampened with soaped water that does not contain abrasives.
- With high g-values, there is a possibility that tube breakage will occur. Should this happen, the centrifuge rotor, adapters and the rotor chamber must be thoroughly cleaned, and all broken particles removed immediately.

ATTENTION!! IF EQUIPMENTS ARE NOT PROPERLY CLEAN AND DISINFECTED THEY WOULD NOT BE ALLOWED TO REPAIR BY THE TECHNICAL SERVICE.

Instructions on environment protection:

- At the end of its life cycle, please do not dispose of this equipment by throwing it in the usual garbage; hand it over a collection point for the recycling of electrical and electronic appliances.
- It does not contain dangerous or toxic products for humans, but a non-adequate disposal would damage the environment.
- The materials are recyclable as mentioned in its marking.
- By recycling material or by other forms of re-utilization of old appliances, you are making an important contribution to protect our environment.
- Please inquire at the community administration for the authorized disposal locations.