

OXFORD

LAB PRODUCTS

Benchmate OTR-24D



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Call us at 800-554-4920 to schedule a product demonstration or to learn about the best consumables for your equipment.

CONTENTS

| | |
|---|-----------|
| 1. INTRODUCTION | 1 |
| 2. INTENDED USE | 1 |
| 3. FEATURES | 1 |
| 4. TECHNICAL SPECIFICATIONS | 3 |
| 5. ACCESSORIES | 3 |
| 6. SAFETY PRECAUTIONS | 4 |
| 7. STANDARD PARTS LISTING | 6 |
| 8. INSTALLATION | 7 |
| 8.1 LOCATION AND MOUNTING | 7 |
| 8.2 CONNECTING THE POWER ADAPTOR | 8 |
| 9. USER INTERFACE AND DISPLAY | 9 |
| 10. REMOVING AND INSTALLING THE DISC PLATE | 10 |
| 10.1 REMOVING THE DISC PLATE | 10 |
| 10.2 INSTALLING THE DISC PLATE | 10 |
| 11. OPERATION | 11 |
| 11.1 SWITCHING ON THE DEVICE | 11 |
| 11.2 SPEED SETTINGS | 11 |
| 11.3 TIME SETTINGS | 11 |
| 11.4 START/STOP OPERATION | 11 |
| 11.5 PULSE MODE | 12 |
| 11.6 PROGRAM MODE | 12 |
| 12. REMOVING TUBES FROM THE DISC PLATE | 15 |
| 13. WARRANTY STATEMENT | 15 |
| 14. PRODUCT DISPOSAL | 17 |

1. INTRODUCTION

This Digital Tube Rotator from Oxford Lab Products (ORT-24D) packs a lot of options and versatility into a small benchtop footprint. It is programmable, with the capacity to save up to 9 personalized and user-defined modes at a time. It has variable speed and run-time settings, an adjustable disc plate angle from 0 through 90 degrees, with a pulse mode option for more thorough mixing. All of which is displayed and set using a digital display. It is equipped with a brushless DC motor for a long operating life and quiet operation. The removable disc plate can be set to suit tubes of different diameter and sizes to suit varying laboratory needs. The disc plate can also be easily removed and replaced for quick and simple cleaning or changing of disc attachments.

2. INTENDED USE

This Oxford Digital Tube Rotator is ideal for a variety of laboratory applications that require the gentle mixing of biological samples, such as the mixing of blood samples in blood collection tubes to prevent coagulation, immuno precipitation, latex agglutination assays, preparation of homogenous dispersions (the mixing of powdered/solid and liquid samples), etc., as well as many more. This unit is ideal for applications where greater control of the mixing parameters is required, or where a higher number of samples are required to be mixed simultaneously.

3. FEATURES

- 3 different disc plate options for different tube diameter, with any chosen one supplied with the instrument.
- Removable disc plates for proper cleaning & better contamination protection.
- Adjustable rotational speed ranging from 10 to 80RPM, increasing in 1 RPM

3. FEATURES

increments and with an accuracy of +/- 1 RPM.

- Adjustable run-time ranging from 1 to 99 mins, or infinite mode.
- Adjustable rotational angle from 0 to 90 degrees.
- Pulse mode function for alternating clockwise and counter-clockwise rotations at 2 sec intervals for the most thorough mixing requirements.
- “Auto Power On” option in case of power failure. This means that mixing will resume automatically once power is restored, and run for the remaining time on the timer.
- Digital display for easy program set-up.
- Maintenance free brushless DC motor for quiet operation and long operational life.
- Small footprint for optimal use of available laboratory space.
- Closed loop operation for exact speed control under varied load conditions.
- Maximum operational weight capacity of 2 kg.

4. TECHNICAL SPECIFICATIONS

| | |
|-------------------------------|--|
| Motor Type | Brushless DC motor |
| Motion Type | Rotating |
| Speed Range | 10 - 80 RPM |
| Speed Accuracy | ±1 RPM |
| Speed steps | 1 RPM Increments |
| Timer range | Timed from 1 to 99 mins, or Continuous |
| Disc Angle | 0° to 90° |
| Max Loading Capacity | 2 kg |
| Removable Disc plate | Yes, 3 Options Available |
| Protection class | IP 21 |
| Permissible Ambient Temp | 5°C to 40 °C |
| Permissible Relative Moisture | <80% |
| Permissible Air Pressure | 80 to 106 kPa |
| Dimensions | 382 x 330 x 320 |
| Input Voltage | 100 - 240 VAC, 50 / 60 Hz |
| Output Voltage | 24VDC |
| Power Consumption | 4.5 W |

5. ACCESSORIES

- 1.Power Supply (adaptor).
- 2.Product user manual and warranty card.

NOTE: Before using the instrument, please read this user manual carefully. This user manual is intended to assist with the operation and care of the unit only and not its repair. For repair please contact the supplier.

6. SAFETY PRECAUTIONS

- Never use the instrument in any manner, or for any purpose, not specified in this manual.
- Equipment used in any manner not specified in this manual, or by the manufacturer, may result in the lapse of warranty.
- Do not try to stop the disc plate rotating by blocking/holding it. Do not attempt to remove disc plate during operation.
- Never move the instrument while the equipment is operating or connected to the mains power supply.
- Repairs must only be performed by an authorized service technician.
- Only use recommended and original spare parts for best result & product safety.
- If liquids are spilled on the disc plate, the instrument should be turned off, disconnected from the power supply and cleaned carefully and properly before being used again.
- Prior to mixing, the tubes should be inspected for material damage. Damaged tubes must not be used as this can result in sample loss and contamination of the instrument.
- The maximum capacity of 2 kg must not be exceeded.
- This product must be used for specified applications only. It must not be operated in a hazardous or flammable environment and it must not be used to mix explosive or highly reactive substances.
- Do not place potentially hazardous material within close proximity of the unit.
- Wear personal protective equipment in accordance with, and appropriate

6. SAFETY PRECAUTIONS

for, the hazardous category of the substance(s) to be processed using this unit. Note, there is a risk of liquid splashing.

- Place the instrument on a flat, level and stable surface. Ensure that the feet of the instrument are clean and undamaged.
- Load the tubes safely in the clamps provided on the disc plate. Always distribute the samples/tubes evenly around the disc plate, so that the disc plate is balanced.
- Do not move the instrument while it is operating or connected to the main power supply.
- Ensure that the disc plate knob is securely tightened before operating the instrument.
- Do not apply any unnecessary pressure to the disc plate knob. It should be used only for locking and unlocking the disc plate.
- Ensure that only closed or tightly sealed tubes are used for mixing with this instrument.
- Do not lean on the equipment. It may cause damage to the unit or harm the operator.
- Do not fill tubes or handle open liquids near the device, as spillages may damage the device.
- In the event of contamination with hazardous, corrosive or harmful agents, the device must be cleaned immediately using warm water and a neutral cleaning agent. If any damage is observed, contact an authorized service technician.
- The power adaptor given with the unit is designed to be used for this unit only. Do not attempt to use any other power adaptor to operate this

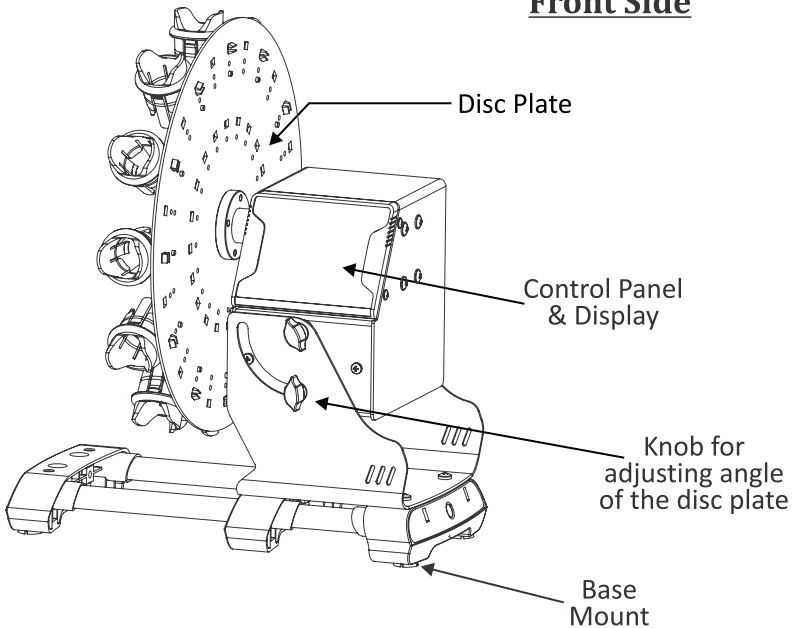
6. SAFETY PRECAUTIONS

unit.

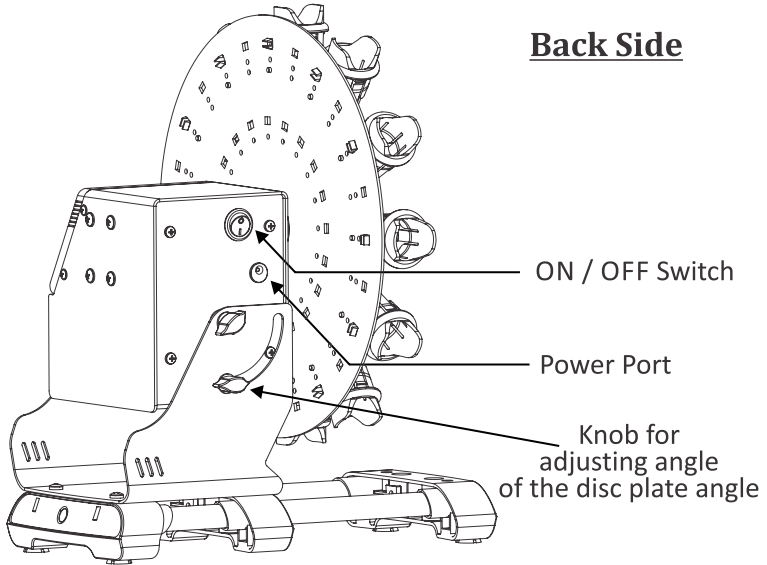
- Only process substances which will not react dangerously to the extra energy produce by mixing them in sealed vessels.
- Do not operate the appliance in an explosive atmosphere, with hazardous substance or submerged under water.

7. STANDARD PARTS LISTING

Front Side



7. STANDARD PARTS LISTING



8. INSTALLATION

Gently remove the upper packaging and take out the Oxford Tube Rotator (ORT-24D) by holding it from the bottom. When this equipment is used for the first time, ensure that all the packaging is removed from the product before it is connected to the mains power supply and switched on. Please keep all the packaging in safe storage for at least 2 years for warranty purposes.

8.1 LOCATION AND MOUNTING

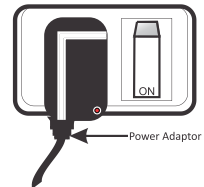
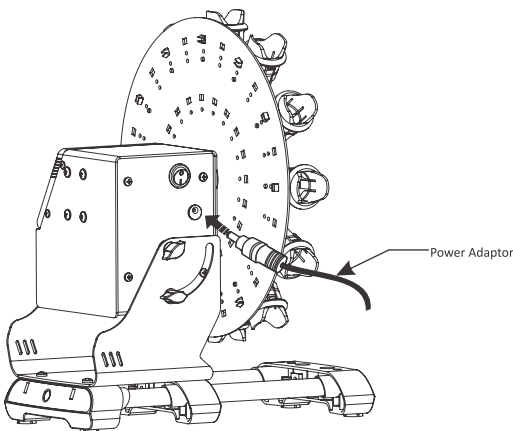
- Place the device on a clean, level and stable surface and ensure that all four feet stand on the surface firmly. Avoid installing the device on a slippery surface or a surface that is prone to vibration.

8. INSTALLATION

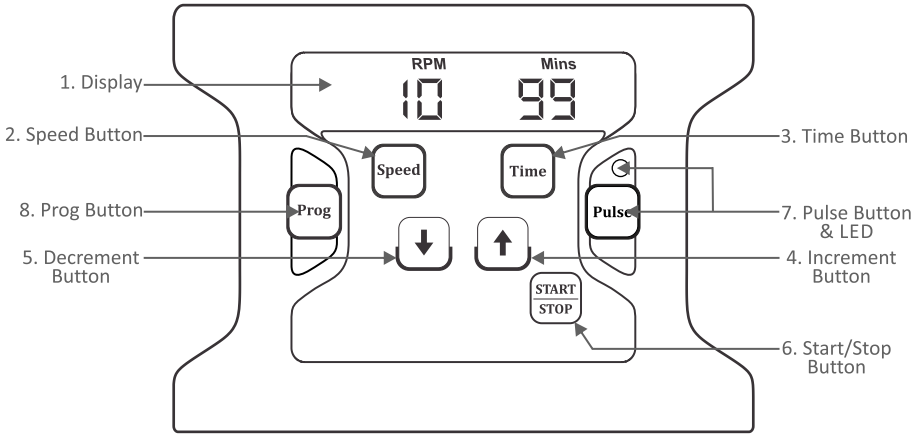
- The ideal ambient temperature is $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$; avoid placing the device in direct sunlight.
- Install the device with a clearance of at least 30 cm on all sides to guarantee cooling efficiency.
- Keep the unit away from heat or water to avoid damage and issues with sample temperature.
- Do not install the device at a location where it may be difficult to reach and operate.

8.2 CONNECTING THE POWER ADAPTOR

- Connect one end of the power adaptor to the back of the unit via the power port and the other end to the power supply, as shown in the diagram below.
- Ensure that the power switch is OFF while connecting the power adaptor to both the unit and the mains power supply.



9. USER INTERFACE AND DISPLAY

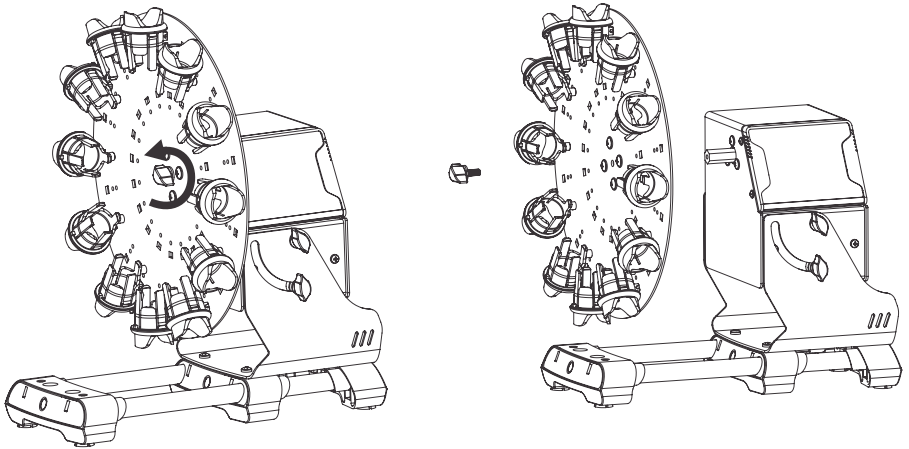


| No. | Description |
|------------------------------------|--|
| 1. Display | The display shows the set speed and time value. It also displays the selected program when in Prog. Mode. |
| 2. Speed | Press "Speed" to set the desired speed value using the increment and decrement buttons. |
| 3. Time | Press "Time" to set the desired time value using the increment and decrement buttons. |
| 4 / 5. Increment / Decrement | Press the "Increment" or "Decrement" button to increase or decrease the value you are setting. |
| 6. Start/Stop | Press "Start/Stop" to start a new operation or stop a running operation. |
| 7. Pulse & LED | Press "Pulse" once to start the pulse function and press it once again to stop pulse. The Pulse LED will glow when Pulse Mode is in operation. |
| 8. Prog | Hold down the "Prog." Button to enter program mode and use the other buttons above to set the desired parameters for the selected program. |

10. REMOVING AND INSTALLING THE DISC PLATE

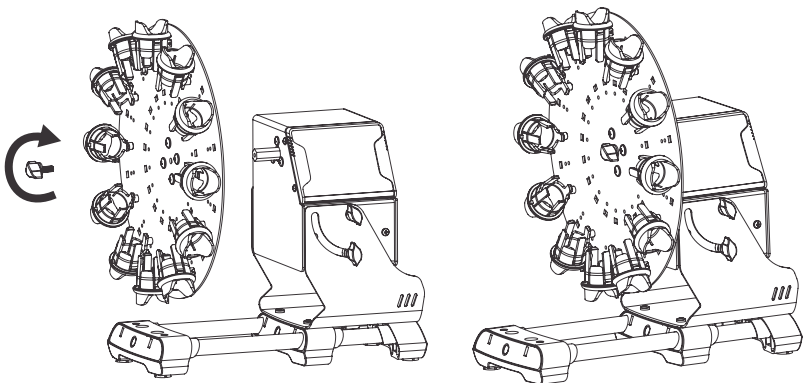
10.1 REMOVING THE DISC PLATE

The disc plate can be removed or changed by simply turning the knob in a counter-clockwise direction, removing the knob, and then removing the disc plate, as shown in the diagram below.



10.2 INSTALLING THE DISC PLATE

To install a disc plate, simply reverse the process described above to mount the disc plate and replace and tighten the knob in a clockwise direction until it is secure, as shown below.



11. OPERATION

11.1 SWITCHING ON THE DEVICE

After connecting the power adaptor to the rear of the device, as described in section 8.2 above, switch ON the main power supply & then switch ON the device using the switch on the rear side. Make sure that the tubes are secure and that they are distributed evenly before use.

11.2 SPEED SETTINGS

Press "Speed" to enter speed setting mode and then set the desired rotational speed using the "Increment" and "Decrement" buttons. The operational speed ranges from 10 RPM to 80 RPM in incremental / decremental steps of 1 RPM. Speed values are saved after blinking 5 times.

11.3 TIME SETTINGS

Press "Time" to enter time setting mode and then set the desired run time using the "Increment" and "Decrement" buttons. The run time for operation can be set for any duration from 1 minute to 99 minutes, in incremental/decremental steps of 1 minute. It can also be set for continuous or infinite mode, indicated by "][" in time display, for indefinite mixing time. The value will be saved after 5 blinks. The countdown timer will get activated as soon as the operation starts. Time cannot be modified when a run is in operation.

11.4 START/STOP OPERATION

Once the required speed and time are set, press "Start/Stop" to START operation. Rotation speed gradually increases to the set RPM and time begins counting down as soon as the operation starts.

Press "Start/ Stop" again to STOP an ongoing operation at any time. Speed gradually decreases from the set RPM to zero (0), and stops, in a few seconds.

11. OPERATION

Note: Speed and time cannot be changed / modified during operation.

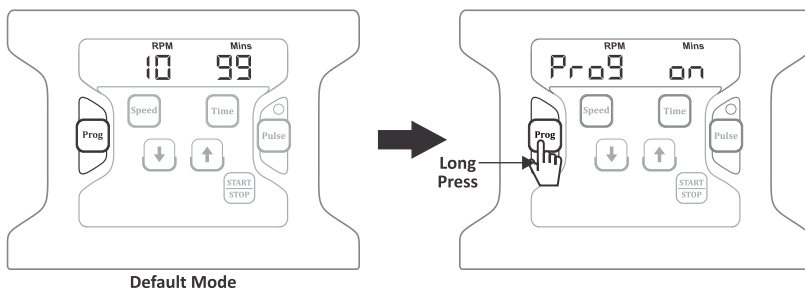
11.5 PULSE MODE

Pulse mode is used when more vigorous mixing of samples is required. When in pulse mode, the rotational direction alternates between clockwise and counter-clockwise every 30 seconds. Default cycle time set for pulse mode is 30 seconds.

Speed and total run time must be set before pulse mode can be activated. Once the speed and total run time are set, press the "Pulse" button to initiate pulse mode for that particular speed and total run time. In pulse mode, the pulse LED will glow indicating pulse mode operation is active.

11.6 PROGRAM MODE

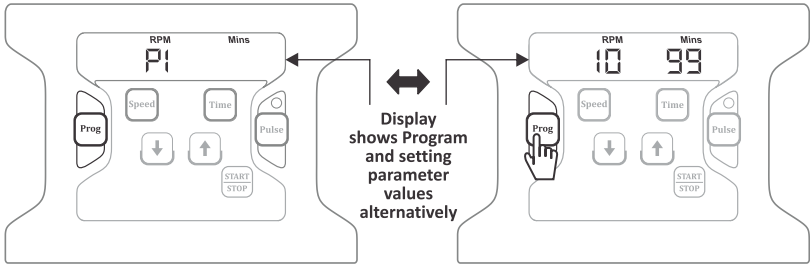
The program mode operation feature allows the user to save 9 programs which can have different speed and time parameters. The user can then use any of these pre-made programs by simply entering program mode and selecting the desired program. To turn on program mode, hold down "Prog" until "Prog on" appears on the display, indicating that program mode is activated.



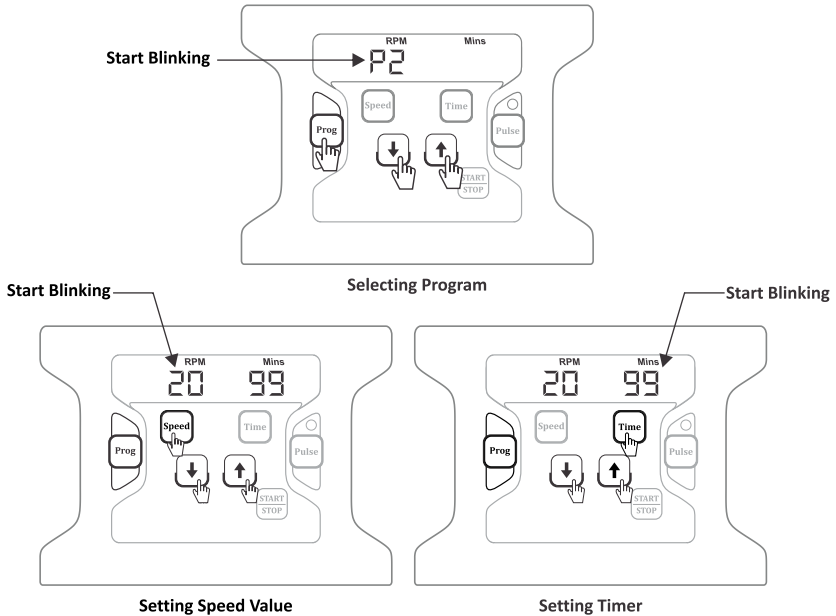
After a few seconds, the display will show "P1" and "speed & time values" alternatively. This shows that the current program is P1 with the set

11. OPERATION

speed (RPM) and time (mins) value.



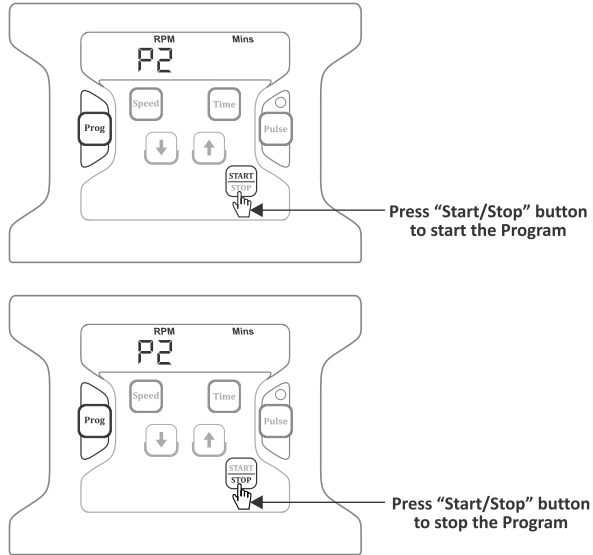
Press the "Program" button to select any program from P1 to P9. Programs can also be selected by pressing "Increment" or "Decrement" buttons. Once the desired program is selected, press the "Speed" button to select and set the speed value. Press "Time" to select and set the time value.



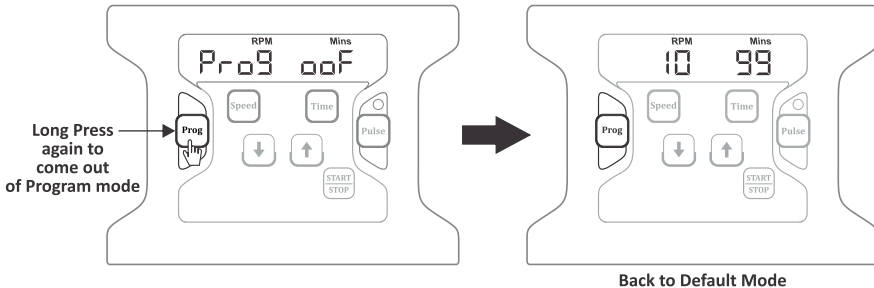
Speed and time values for that program are now saved. Press the "Start" button to start that program mode. Once the set RPM is reached, the

11. OPERATION

program "Px" (x = 1 to 9, depending on the program selected) and its "Speed" & "Time" value will display alternatively.



To leave program mode, hold down the "Program" button again, turning OFF program mode. The display shows "Prog off", indicating program mode is off.



Note: On every restart, the device automatically comes out of program mode. It shows the last run default speed and time values.

12. REMOVING TUBES FROM THE DISC PLATE

- To remove tubes from the disc plate, do not try to rotate the disc plate by hand.
- Simply begin pulling the tubes which are at the top of the disc plate from their clamps, one by one.
- When you get to the tubes that are further down, toward the bottom of the disc, simply single press the “Pulse” button to rotate the disc plate so that the tubes at the bottom of the disc plate become more accessible.
- Now, pull out the remaining tubes from the clamps on the disc plate, one by one.
- Follow this process to avoid damage to the disc plate and tubes.

13. WARRANTY STATEMENT

This product is warranted to be free from defects in material and workmanship for a period of two (2) years from the date of purchase. Your product will be duly repaired upon prompt notification of defect, in compliance with the following conditions:

- This warranty is valid only if the product is used for its intended purpose and within the guidelines specified in this instruction manual. This warranty does not cover damage caused by accident, neglect, misuse, improper service, natural forces or other causes not arising from defects in original material or workmanship. This warranty does not cover any incidental or consequential damages, commercial loss or any other damages from the use of this product.

13. WARRANTY STATEMENT

- The warranty is invalidated by any non-factory modification, which will immediately terminate all liabilities on us for the products or damages caused by its use. The customer shall be responsible for the product(s), or use of product(s), as well as any supervision required for safety. If requested, the product(s) must be returned to the distributor in a well packed and secure manner and all shipping charges must be paid.

***Note:** Some states do not allow limitation on the length of implied warranties or the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights. This warranty is given expressly in lieu of all other warranties, expressed or implied.*

- The purchaser agrees that there is no warranty of merchantability or of fitness for any intended purpose and that there are no other remedies or warranties, expressed or implied, which extend beyond the description on the face of the agreement. This warranty is only applicable to the original purchaser.

- Products received without proper authorization will not be processed for warranty or service. All items returned for service should be sent with postage prepaid in the original packaging or other suitable packaging, padded to avoid damage. We will not be responsible for damage incurred by improper packaging.

***Note:** This warranty is valid only if the warranty is registered with the supplier within 30 days of the date of purchase.*

13. WARRANTY STATEMENT

For your reference, make a note of the serial number, date of purchase and supplier here.

Serial No.:

Purchase Date:

Supplier:

14. PRODUCT DISPOSAL

By observing proper disposal of the equipment, you will help conserve natural and environmental resources along with protecting human health. This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste. The user is responsible for correctly disposing of the equipment by handing it over to an authorized facility for separate collection and recycling. It is also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, to protect the person(s) involved in the disposal and recycling of the equipment from health hazards.



Please contact your local dealer from whom you originally purchased this equipment to get more information about where you can drop off your waste equipment.

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Send warranty card information to:

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Thank You for choosing Oxford Lab Products for your research.