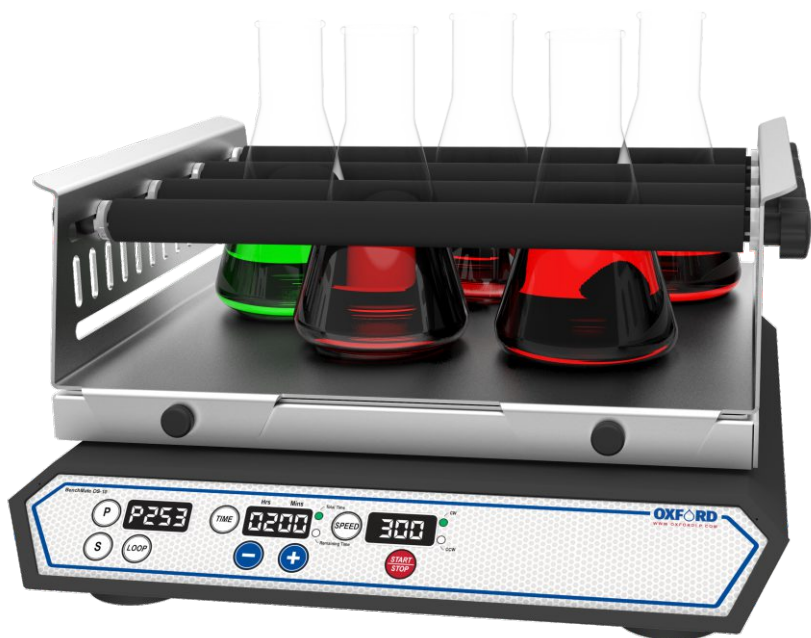


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LAB PRODUCTS

Benchmate OS-10/ 20



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CONTENTS

1.	INTRODUCTION	1
2.	INTENDED USE	1
3.	FEATURES	1
4.	TECHNICAL SPECIFICATION	2
5.	ACCESSORIES	3
5.1	LIST OF OPTIONAL ATTACHMENTS	3
6.	SAFETY PRECAUTIONS	4
7.	INSTALLATION	5
7.1	IDEAL LOCATION	5
7.2	CONNECTING POWER ADAPTOR	6
7.3	MOUNTING	6
8.	STANDARD PARTS LISTING	7
9.	USER INTERFACE AND DISPLAY	8
10.	OPTIONAL ATTACHMENTS	9
11.	ATTACHMENTS INSTALLATION	10
11.1	INSTALLING & REMOVING UNIVERSAL ATTACHMENT	10
12.	SUPPORTING WEIGHT ON ATTACHMENTS	11
13.	OPERATION	12
13.1	SETTING TIME AND SPEED	12
13.2	START AND STOP OPERATION	13
13.3	PROGRAM MODE	13
13.4	PROGRAM MODE FLOW CHART	14
14.	WARRANTY STATEMENT	17
15.	PRODUCT DISPOSAL	19

1. INTRODUCTION

This user manual provides important operational and safety information for this Orbital Shaker (OS-10 or OS-20). It should be kept near the equipment for quick & easy user reference. This platform shaker enables the shaking (orbital/linear motion) of liquids and semi-liquids up to a maximum total weight of 7.5 kg. It supports various attachments for mixing liquids in bottles, flask, test tubes and bowls. It is supplied with a non-slip mat (optional) for holding flasks and beakers. It comes with program and sub-program features for a variety of personalized mixing preferences and purpose.

2. INTENDED USE

This shaker is intended to be used to mix, blend, or agitate liquids and semi-liquids (up to 7.5kg) in tubes or flasks by shaking them. Its primary applications are in the areas of chemical and biological science. The shaker consists of an oscillating platform to which flasks, beakers, test tubes, etc. can be secured. This shaker is an ideal choice when dealing with larger liquid volume, or simultaneously agitating multiple vessels or samples.

3. FEATURES

- True orbital/linear motion, for shaking masses up to 7.5 kg
- Brushless DC motor for long life and maintenance-free operation
- LED display for parameter adjustment and simultaneous viewing of speed, time and mode of operation, at a glance.
- A variety of different attachments are available, making it possible to use almost all shapes and sizes of vessels.
- Mix at speeds ranging from 50 to 500 RPM for orbital & linear motion of the 10 mm system, and 50 to 300 RPM for orbital & linear motion

of the 20 mm system.

- Program mode allows the user to define rotational direction (clockwise, counter-clockwise), speed, time, dwell time and sequence, with loop operation settings available.
- Last run memory feature allows easy repeating of your favorite or most used settings.

4. TECHNICAL SPECIFICATION

Motor Type	BLDC motor
Orbital/Linear Motion	10 mm / 20 mm diameter
Variable Speed	50 to 500 RPM / 50 to 300 RPM
Run Time	1 min to 99.59 hours
Maximum allowable Weight	7.5 Kg (Including Attachment)
Platform size (LxW)	330 x 330 mm
Protection Rating	IP 21
Permissible ambient Temp.	5°C to 40°C
Permissible relative moisture	<80%
Permissible ON time	100%
Air Pressure	80 to 106 kPa
Noise Level	<60 dB
Weight	10 kg
Dimensions (W x D x H)	408 x 350 x 99 mm
Input Voltage	24 VDC 1.5 A
Power Consumption	24 W
RS-232 Interface	Optional

5. ACCESSORIES

1. Power Adaptor
2. Attachments (Optional)
3. Spanner
4. Product User Manual

5.1 LIST OF OPTIONAL ATTACHMENTS

OS-UA	Universal Attachment for Platform Shaker
OS-SBP	Stainless Steel Base Plate with Slip Resistant Tray (Attachment for Platform Shaker)
OS-PBP250	Plastic Base Plate with 9X 250mL Plastic Flask Clamps (Attachment for Platform Shaker)
OS-PBP500	Plastic Base Plate with 9X 500mL Plastic Flask Clamps (Attachment for Platform Shaker)
OS-FA	Funnel Attachment for Platform Shaker
OS-SBP250	Stainless Steel Base Plate with 9X 250mL Stainless Steel Flask Clamps (Attachment for Platform Shaker)
OS-SBP500	Stainless Steel Base Plate with 9X 500mL Stainless Steel Flask Clamps (Attachment for Platform Shaker)
OS-SC100	100mL Stainless Steel Flask Clamp
OS-SC250	250mL Stainless Steel Flask Clamp
OS-SC500	500mL Stainless Steel Flask Clamp
OS-SC1000	1000mL (1 L) Stainless Steel Flask Clamp
OS-VA	VDRL Attachment for Platform Shaker

6. SAFETY PRECAUTIONS

Note: For this unit to be used correctly and safely, each user must read the operational and safety instructions before use.

- Do not load the unit with more than 7.5 kg of mass.
- For user safety, always wear personal protective equipment while working with any laboratory materials.
- To prevent injury, do not touch moving parts while the unit is in operation.
- Only install and operate the unit on a flat, stable, non-slip surface.
- Do not hold or try to lift the unit while it is in operation.
- Ensure to unplug the power adaptor before cleaning.
- Ensure that the product is used for specified applications only. It should not be used for shaking hazardous or reactive substances.
- It must not be operated in a hazardous or flammable environment/ atmosphere or submerged under water, and must not be used to mix explosive or highly reactive material(s).
- If there is any indication of electrical or mechanical damage, do not use the instrument and contact the supplier immediately.
- Ensure to firmly tighten the shaker attachments to prevent them from becoming dislodged and causing injury.
- If the device is not working smoothly, reduce the shaking speed or load on the platform until it operates smoothly again.
- If there is an interruption in power supply during operation, the instrument will not start automatically again when the power supply is restored.
- This shaker must only be used to mix materials that will not react

dangerously to the extra energy produced by the shaking or mixing motion. The user should also be aware of any extra energy supplied by the external environment, such as solar radiation, during shaking.

- Accessories should only be attached once the plug has been disconnected.
- The safety of the user cannot be guaranteed if the appliance is operated with accessories that are not supplied or recommended by the manufacturer, or if the appliance is operated incorrectly, contrary to the manufacturer's specifications.
- Always use the power adaptor recommended or supplied by the manufacturer. Failure to do so will void the warranty.
- Make sure that all the attachments are attached and tightened properly before performing any operation.

7. INSTALLATION

This smart platform shaker is supplied in a box. Open the box, remove the packaging and gently place the device on a firm, level surface. Take care while unpacking and removing all accessories. The user manual should be kept with the device for easy access. Please keep all packaging in safe storage for at least two years for warranty purpose.

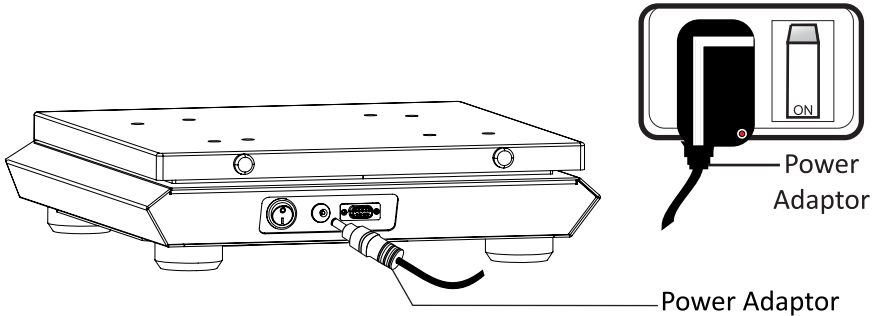
7.1 IDEAL LOCATION

1. Ideal ambient temperature is $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$; avoid placing the shaker in direct sunlight.
2. Keep a clearance of at least 30 cm in all direction to guarantee easy and safe operation.
3. Keep away from heat and water to avoid temperature issues or shaker failures.

4. Do not place the shaker in a difficult to operate location.

7.2 CONNECTING POWER ADAPTOR

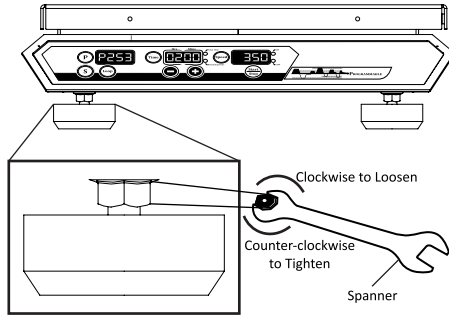
Connect one end of the power adaptor to the rear side of the instrument and other end to the power supply, as shown in the figure below.



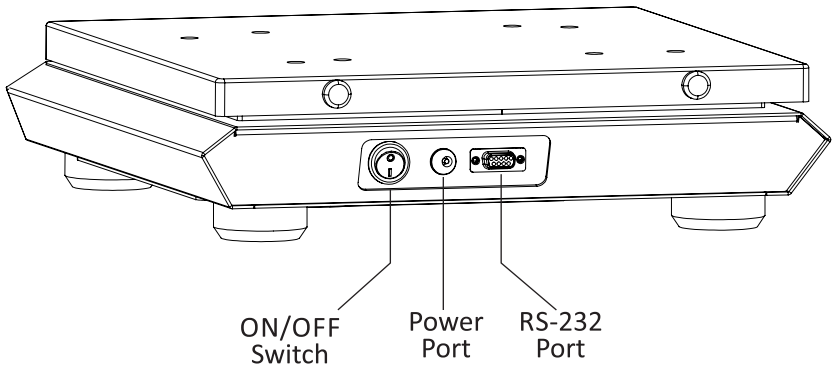
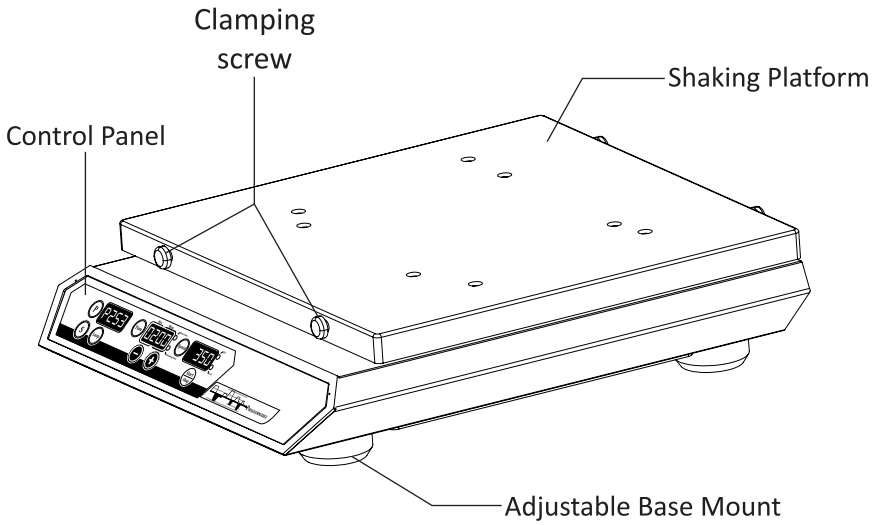
7.3 MOUNTING

Place the instrument on a flat and level surface; ensure that the four feet of the shaker stand on the surface firmly and securely. Avoid installing on a slippery surface or a surface prone to vibrations or movement. If the mounting surface is uneven, adjust the appropriate base-mount of the instrument downward or upward. Turn the base-mount in the clockwise direction to move the base mount upward and turn the base-mount in the counter-clockwise direction to move the base mount downward, until the optimal position is achieved.

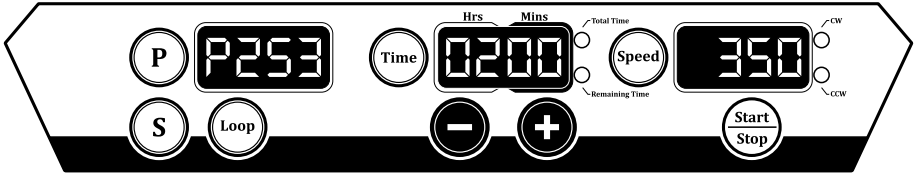
To avoid loosening of the base-mount, after adjustment to the desired position, hold the base-mount with one hand and tighten the nut of the base-mount using a spanner. Tightening of the nut is in the clockwise direction and loosening in the counter-clockwise direction. Please make sure that the instrument is level on a mounting surface for efficient and safe operation.



8. STANDARD PARTS LISTING



9. USER INTERFACE AND DISPLAY



Speed Section



Speed button, Speed value display and CW/CCW direction selection LED.

- Press “Speed” button to select and set the speed value.
- Clockwise (CW) and counter-clockwise (CCW) LEDs allow the user to select the direction of rotation. Press “Speed” button to select speed with CW direction of rotation. Press “Speed” button again to select speed with CCW direction of rotation. By default, the direction of rotation is CW

Time Section



Time button, Time value display, Total time and Remaining time indication LED.

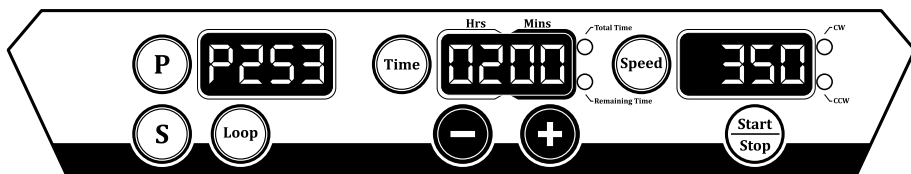
- Press “Time” button to select and set the time value in hours and minutes. The first press allows the user to select the time in “minutes” and a long press allows the user to select the time in “hours”.
- Total Time and Remaining Time LED will glow only during operation. Both LEDs will glow alternately.

(+) & (-) Section

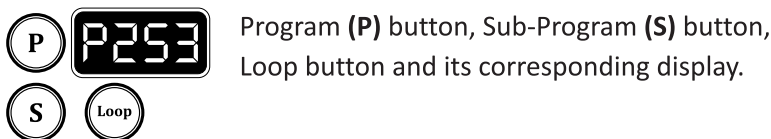


Increment and Decrement Buttons.

- Increment (+) and Decrement (-) buttons are used to increment or decrement speed, time and program value.



Program Mode Section



- Long Press “P” to enter or exit from program mode.
- Single Press “P” to select programs.
- Single Press “S” to select Sub-Programs.
- Single Press “Loop” button to Loop the sub-programs of a particular program

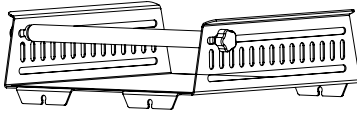
Start/Stop Button



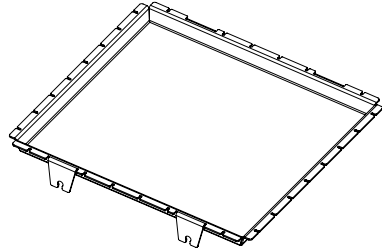
10. OPTIONAL ATTACHMENTS

Optional attachments are used for the shaking of liquids in flask, funnel, tubes, bottles etc. All of these attachments are easily placed and tightened on the shaking platform.

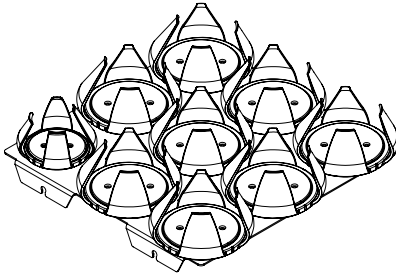
Below are images of the optional attachments, their names and usage.



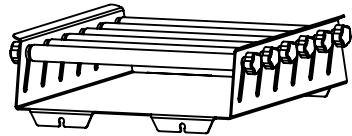
Universal Attachment



Disc Attachment



Flask Attachment

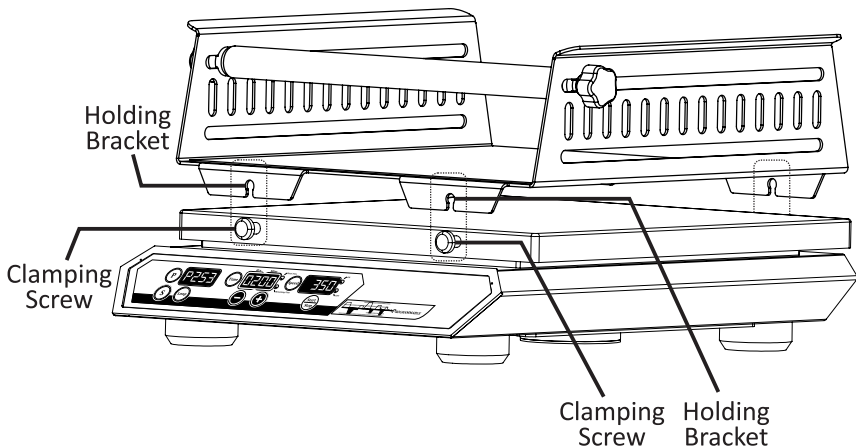


Funnel Attachment

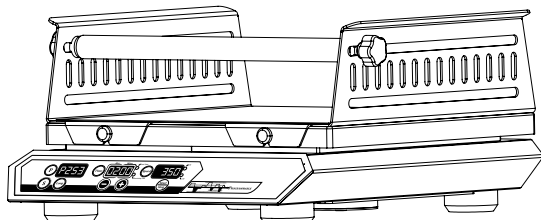
11. ATTACHMENTS INSTALLATION

11.1 INSTALLING & REMOVING UNIVERSAL ATTACHMENT

All attachments must be firmly secured on the shaking platform. Make sure that unit is OFF while you place the attachment on the platform. Holding the attachment firmly with both hands, place it on the shaking platform. Guide all four holding brackets onto their respective clamping screws. Once the attachment is placed on the clamping screws, tighten all four clamping screws securely.



To remove the attachment, loosen the clamping screws and lift the attachment up and off the clamping screws.



Note: Do not place any flask or beaker, or any liquid material on the attachment while attaching to the shaking platform. Hold the attachment carefully with gloves for user protection.

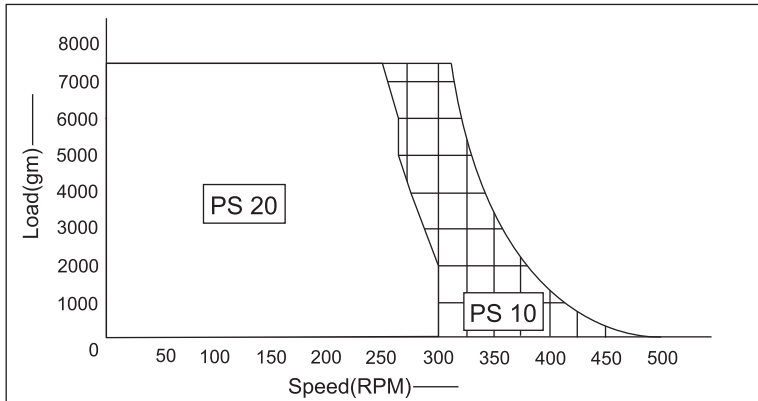
12. SUPPORTING WEIGHT ON ATTACHMENTS

To ensure safe and secure operation, the shaking platform must only be operated within the range of usable weight (load) and speed (see diagram).

Please make certain that the platform surface on which the attachment is placed is clean and level. If an attachment is secured to the platform (i.e. if the unit is integrated into a system consisting of the unit and an attachment) it should be noted that during operation, dynamic forces may arise due to unfavorable loading circumstances altering the position of the center of gravity. This may cause the equipment to vibrate uncontrollably. If you notice that the device is running unevenly, consider lowering the rotational speed until the vibration, or irregular rotation, ceases.

To best avoid this scenario, ensure that individual vessels are placed in the middle of the attachment and multiple vessels are evenly placed around the attachment. Also, ensure that all the vessels are firmly fastened to the attachment.

Load VS Speed (Universal Attachment)



50-300 RPM (20 mm Offset) 50-500 RPM (10 mm Offset)

13. OPERATION

13.1 SETTING TIME AND SPEED

Single press the “Time” button to select the time value. On the first press, the minutes value will be selected, and on the second press the

hours value will be selected. Minutes and hours values will toggle on each press. Use the increment and decrement buttons to modify and set the required time.

Once the operation is started, the timer value in the display will toggle or alternate between showing “Total Time” and “Remaining Time” once the set RPM is reached. The timer value can't be modified or change while an operation is running.

Speed, in RPM, is set in the same way as time but using the “Speed” button.

13.2 START AND STOP OPERATION

Once the required speed and time values are set, press the “Start” button to start operation. The unit will start slowly and increase in speed until the set RPM is reached. Press the “Stop” button to stop the unit. The rotational speed will reduce steadily.

13.3 PROGRAM MODE

Program mode is a feature used to run the shaker in a user define mode. For Example, if a user has a requirement for a specific type of shaking mode such as:

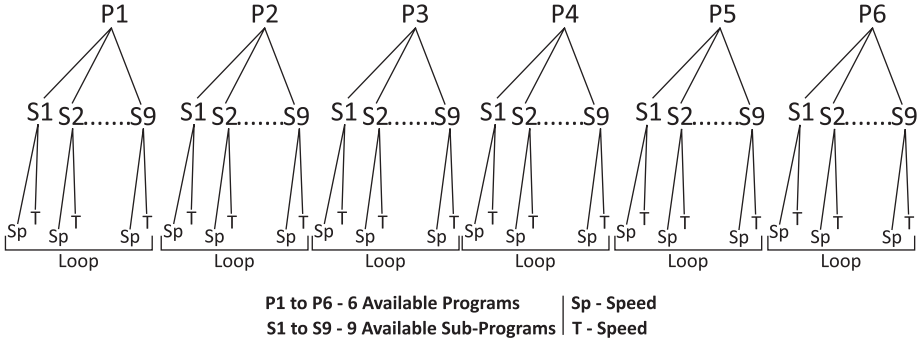
- 1) 250 RPM shaking in a clockwise direction for 2 minutes, then
- 2) Hold of 1 minute, then
- 3) 400 RPM shaking in a counter clockwise direction for 4 minutes, and so on.

This kind of specific shaking is achieved using the program mode.

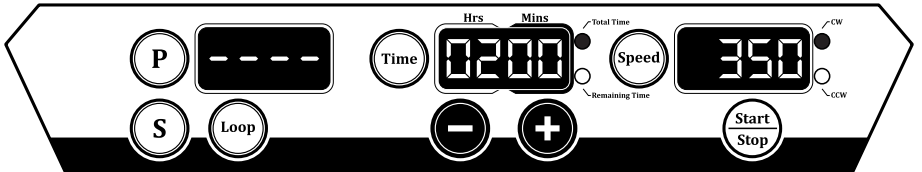
There is a total of 6 Programs available, from P1 to P6. Each of these programs has 9 sub-programs from S1 to S9, and a Loop mode for continuous or repetitive operation.

13.4 PROGRAM MODE FLOW CHART

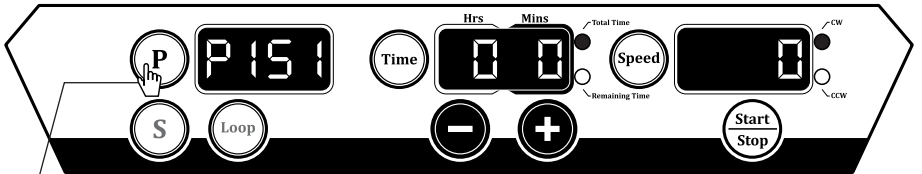
Each Program has 9 different Sub-programs, and all 9 sub-programs can have different speed and time values. Looping of each sub-program can be achieved using the “Loop” button.



Initially, there will be no display visible in the program mode, indicating that the shaker is running or operated in normal mode.



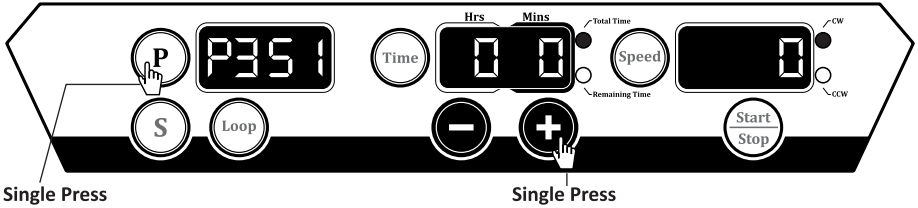
Long press “P” to select Program mode. Once selected, the below display will be observed.



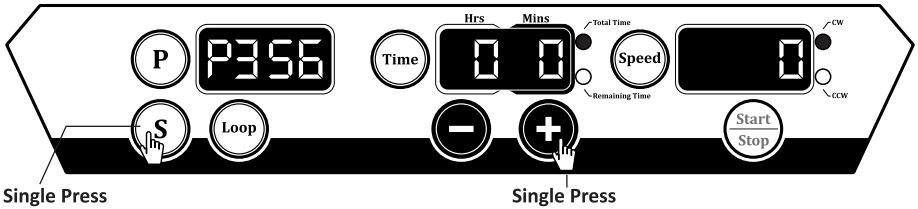
Long Press

The above image show that the shaker is in Program mode, and currently Program 1 (P1)Sub-program 1 (S1) is selected. Both speed and time values are currently zero (0) for this program.

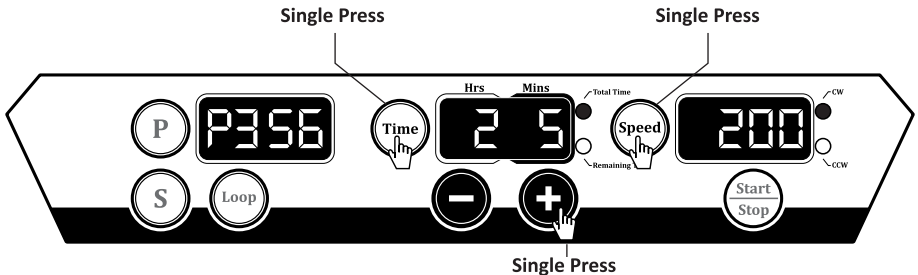
Single press the “P” button to select Program. The Program value will start blinking and the user can use increment or decrement button to select any program from the 6 available programs.



Single press the Sub-program Button “S” to select the sub-program. The sub-program value will start blinking, indicating that the user can use the increment and decrement buttons to select any sub-program from the 9 available sub-programs.

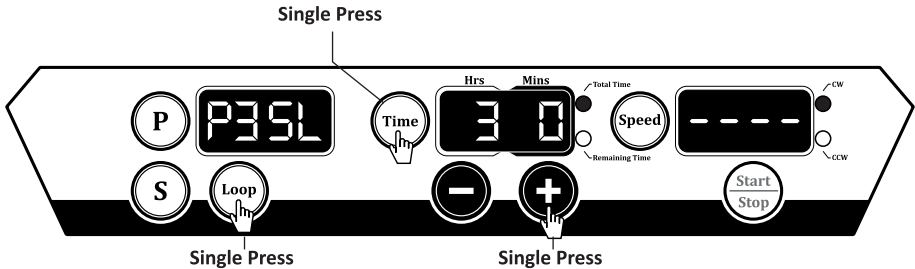


Once the required sub-program is selected, use the speed and time buttons to set the required speed and time values for that sub-program.



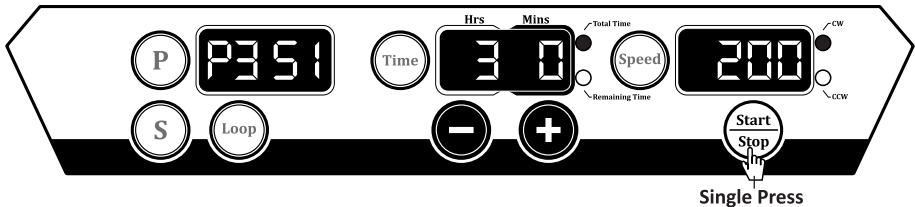
In this way, the user can set different speed and time values for different sub-programs. The user can also set a type of rotational direction (clockwise or anti-clockwise rotation) for that particular sub-program.

Press the “Loop” button to make the loop of sub-programs. The display will show “SL” indicating that Loop is selected. The user can set the total time of the Loop by pressing the “Time” button.



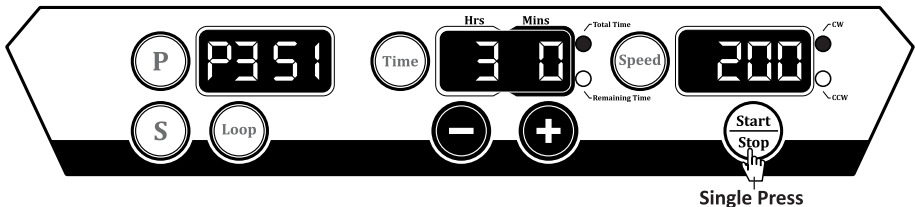
The above image shows that a loop of Program 3 “P3” is created and that loop will go on for 3 hours.

Press the start button to start the operation. The operation will start for that program from the first sub-program.



The operation starts with the first sub-program and runs through to the last sub-program that is set. The loop of sub-programs will continue for the total time set.

Press “Stop Button” to stop the program mode operation at any time.



The operation starts with the first sub-program and runs through to the

last sub-program that is set. The loop of sub-programs will continue for the total time set.

Press “Stop Button” to stop the program mode operation at any time.

14. WARRANTY STATEMENT

This product is warranted to be free from defects in material and workmanship for a period of two (2) years from date of purchase. Your product will be duly repaired upon prompt notification 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.
- 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 or use of products as well as any supervision required for safety. If requested the products must be returned to the distributor in well packed and insured 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 from the date of purchase.

For your reference, make a note of the serial number, date of purchase and supplier here.
Serial Number:
Purchase Date:
Supplier:

15. 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, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.



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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Visit www.oxfordlp.com to see the complete product offering and learn more about our products.

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

Send warranty card information to:

Oxford Lab Products
10360 Sorrento Valley Road
San Diego, CA 92121

Thank You for choosing Oxford Lab Products for your research.