

Title: Standard Operating Procedure for Orbital Shaking Incubator

Basic Introduction: An orbital shaking incubator is a laboratory instrument designed to provide a controlled environment for the incubation and agitation of biological samples. It combines features of a standard incubator with a shaking mechanism, allowing researchers to grow and maintain cell cultures, conduct molecular biology experiments, and carry out other biological processes under controlled conditions. Here are key features and components commonly found in orbital shaking incubators:

1. **Temperature Control** - Orbital shaking incubators are equipped with precise temperature control systems. The temperature is usually adjustable and can be set to mimic the optimal growth conditions for specific cell types or biological processes.
2. **Shaking Mechanism** - The shaking mechanism is a crucial feature that imparts controlled, uniform agitation to the samples. The orbital motion ensures even mixing of liquids or suspension cultures. The shaking speed is adjustable to accommodate various experimental requirements.
3. **Shaking Platform** - The shaking platform is the surface on which sample containers or vessels are placed. It is designed to move in an orbital motion, providing gentle or vigorous shaking based on the user's settings. Platforms come in different sizes and can often be interchanged to accommodate various vessel types.
4. **Environmental Control** - Some incubators offer additional environmental controls, such as humidity and CO₂ regulation. These features are essential for maintaining conditions suitable for cell culture work.
5. **User Interface** - The incubator typically has a user-friendly interface that allows researchers to set and monitor temperature, shaking speed, and other parameters. Digital displays and control buttons are common features.
6. **Safety Features** - Safety features may include alarms for temperature deviations, power failures, or issues with the shaking mechanism. These alerts help prevent the loss of valuable samples due to equipment malfunctions.
7. **Access Ports** - Incubators often have access ports for introducing probes or sensors without disrupting the internal environment. This is especially useful for real-time monitoring of conditions inside the incubator.
8. **Construction Materials** - The incubator is constructed with materials that are resistant to corrosion and easy to clean. Stainless steel is a common choice for the interior, providing a sterile environment for biological samples.
9. **Optional Accessories** - Some incubators may come with additional features or accessories, such as UV lights for decontamination, adjustable shelves, or a variety of interchangeable platforms to accommodate different vessel sizes.



Orbital shaking incubator

Safety Precautions:

Ensure that the orbital shaking incubator is installed in a well-ventilated and dedicated space.

Verify that the power source meets the incubator's requirements.

Familiarize yourself with the location of emergency exits and emergency shutdown procedures.

Operating Procedures:Start-up Procedure:

- a. Ensure that the orbital shaking incubator is placed on a level surface.
- b. Check that the incubator is clean and free of any debris.
- c. Verify that the shaking platform is securely attached to the incubator.
- d. Ensure the incubator is properly connected to a power source.
- e. Turn on the power switch and allow the incubator to initiate.

Calibration:

- a. Periodically check and calibrate the temperature and speed settings according to the manufacturer's recommendations.

Sample Preparation:

- a. Prepare your samples according to your experimental requirements.
- b. Ensure that the samples are placed in appropriate containers or vessels suitable for shaking.

Loading Samples:

- a. Use appropriate containers/flasks for your samples.
- b. Ensure that the samples are securely placed on the orbital shaking platform.
- c. Close the incubator door securely.

Setting Parameters:

- a. Set the desired temperature on the incubator control panel.
- b. Set the shaking speed and duration according to the experimental requirements.
- c. Ensure that the parameters are within the specified limits for the samples being incubated.

Monitoring:

- a. Regularly monitor the temperature and shaking speed during the incubation period.
- b. Record any deviations from the set parameters and take corrective actions if necessary.

Cleaning and Maintenance:

- a. Regularly clean the incubator interior and exterior.
- b. Follow the manufacturer's guidelines for routine maintenance.
- c. Report any malfunctions or irregularities to the designated personnel.

Shutdown Procedure:

- a. Turn off the incubator using the control panel.
- b. Allow the incubator to cool down before opening the door.
- c. Remove samples carefully, ensuring proper disposal if necessary.

Emergency Procedures:

- a. In case of power outage, check the duration of the outage and take appropriate actions.
- b. Familiarize yourself with the emergency shutdown procedures in case of any malfunctions.

Documentation:

Record all relevant information, including start and stop times, temperatures, shaking speeds, and any deviations from the standard procedure.

Review:

Regularly review and update this SOP to incorporate any changes in equipment or procedures. Specific details may vary based on the model and manufacturer of your incubator, so it's essential to refer to the manufacturer's manual for precise information.