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LAB INCUBATORS 101

EVERYTHING YOU SHOULD KNOW

A WEBINAR BY

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TOPICS

- What an incubator does and why it’s important
- Different types of incubators and their uses
- Key features that matter
- Choosing the right incubator
- Best practices for maintenance

WHAT IS AN INCUBATOR?

A laboratory incubator is a controlled environment designed to support the growth and study of microorganisms and cells by maintaining precise temperature and other conditions.

WHAT IS AN INCUBATOR?

Laboratory incubators are also used for tasks like contrast warming in medical imaging.

WHY IS IT IMPORTANT?

MEDICAL RESEARCH & MICROBIOLOGY

EDUCATION

PHARMACEUTICALS

MEDICAL IMAGING

WHY IS IT IMPORTANT?

MEDICAL RESEARCH
& MICROBIOLOGY

Laboratory incubators play a crucial role in cell cultivation and disease study. They are used to:

- Support the growth of cells for research and experimentation.
- Provide controlled conditions to study diseases and their progression.
- Assist in developing new treatments and medical advancements.
- Maintain optimal temperature, humidity, and gas levels for cell viability.

WHY IS IT IMPORTANT?

EDUCATION

Laboratory incubators are essential science departments. They are used to:

- Provide a controlled environment for growing and observing bacteria.
- Support hands-on learning in microbiology experiments.
- Help students understand microbial growth, reproduction, and behaviour.
- Enhance scientific inquiry and laboratory skills through practical experience.

WHY IS IT IMPORTANT?

PHARMACEUTICALS

Laboratory incubators are essential for drug testing and development. They are used to:

- Assess the stability of drugs under controlled conditions.
- Simulate storage environments to evaluate shelf life.
- Ensure the effectiveness and safety of pharmaceutical products.
- Support research in drug formulation and quality control.

WHY IS IT IMPORTANT?

Laboratory incubators are used for contrast warming to:

- Gently heat contrast media to body temperature (37°C) before CT scans and MRIs.
- Improve patient comfort by preventing cold injections.
- Ensure smoother injections by maintaining optimal contrast media viscosity.
- Reduce the risk of adverse reactions such as extravasation or allergic-like responses.

MEDICAL IMAGING

TYPES OF LABORATORY INCUBATORS

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TYPES OF INCUBATORS

STANDARD INCUBATORS

These are the most common type, controlling temperature to create a stable environment for bacterial and fungal growth

TYPES OF INCUBATORS

CO_2 INCUBATORS

CO_2 incubators are more advanced, controlling carbon dioxide and humidity to create ideal conditions for cell cultures, commonly used in tissue engineering and medical research

TYPES OF INCUBATORS

REFRIGERATED INCUBATORS

Refrigerated incubators provide precise temperature control, including both cooling and heating, making them essential for temperature-sensitive applications such as microbial studies, enzyme reactions, food testing, and environmental research

KEY FEATURES AND HOW THEY WORK

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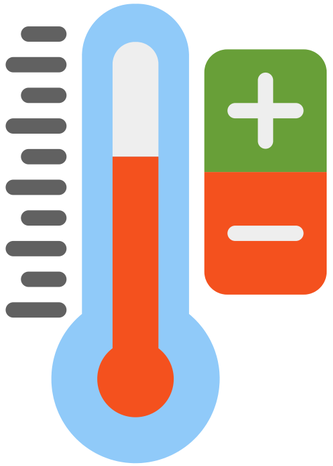
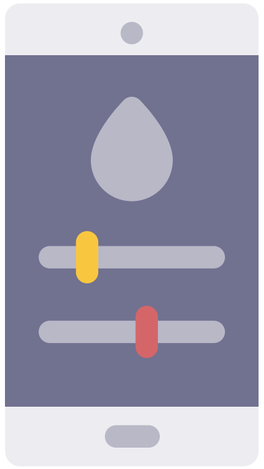
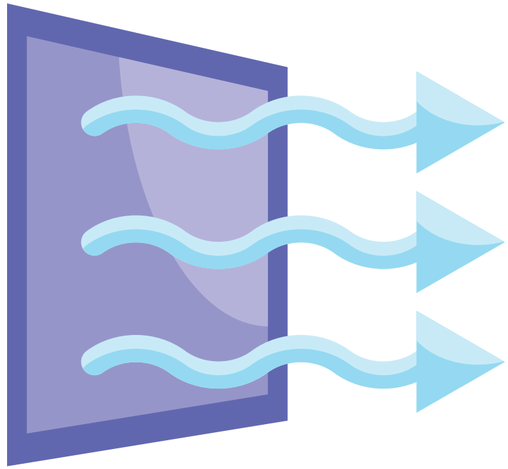
KEY FEATURES



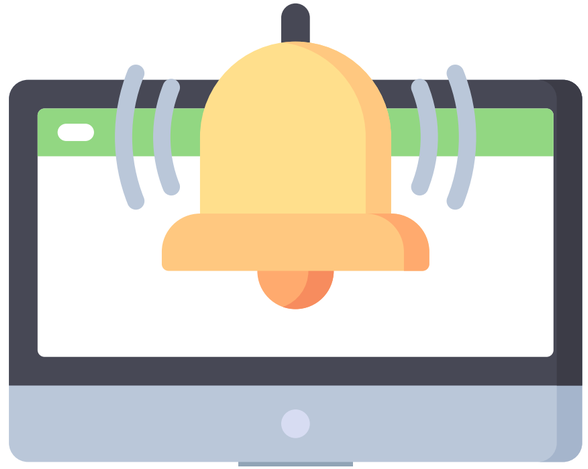
TEMPERATURE CONTROL



HUMIDITY AND GAS CONTROL

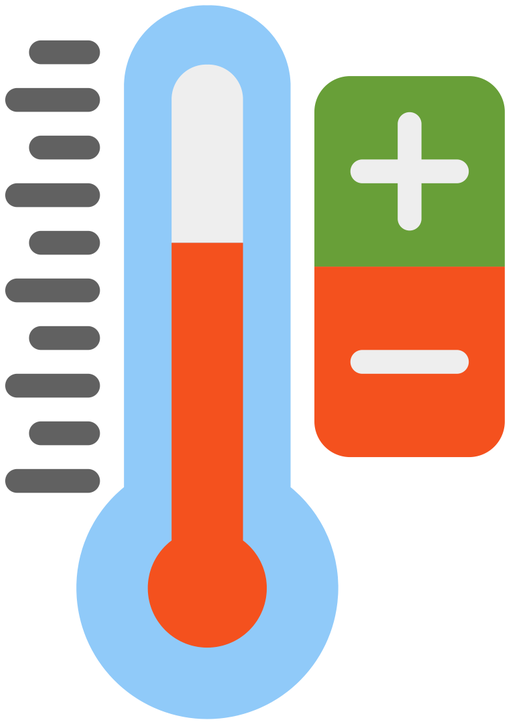


AIRFLOW AND STERILISATION



MONITOR AND ALARMS

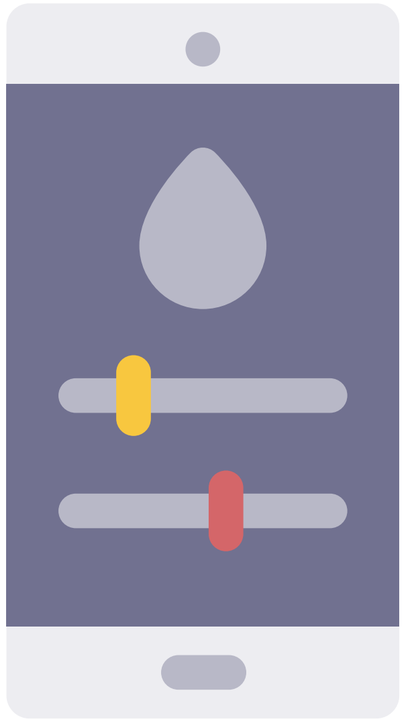
KEY FEATURES



TEMPERATURE CONTROL

- Minimal temperature fluctuations
- Precise heating systems
- Fibreglass insulation

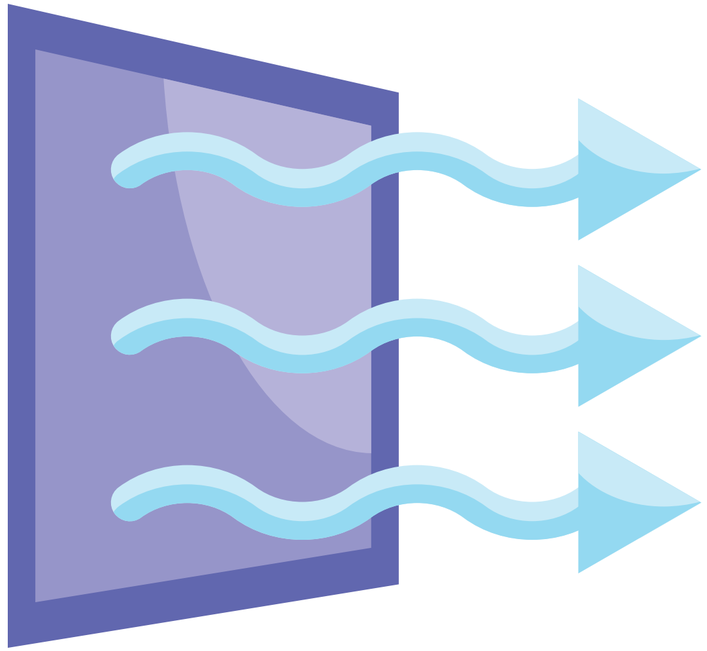
KEY FEATURES



HUMIDITY AND GAS CONTROL

- Precise humidity and gas level control
- Stable environment for healthy cell cultures
- CO_2 regulation for optimal pH balance
- Built-in sensors for automatic adjustments

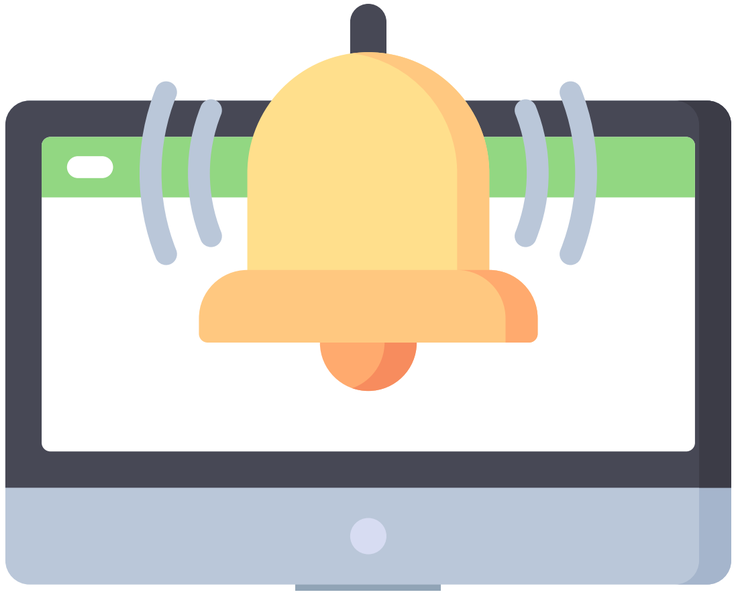
KEY FEATURES



AIRFLOW AND STERILISATION

- Natural convection or fan-forced heat distribution
- Even temperature control for reliable performance
- HEPA filters for a contaminant-free environment
- High temperature 180°C sterilisation for enhanced cleanliness

KEY FEATURES



MONITOR AND ALARMS

- Digital controls for precise adjustments
- Alarms for immediate issue detection
- Remote monitoring for real-time oversight
- Instant alerts to prevent disruptions

MAINTENANCE AND BEST PRACTICES

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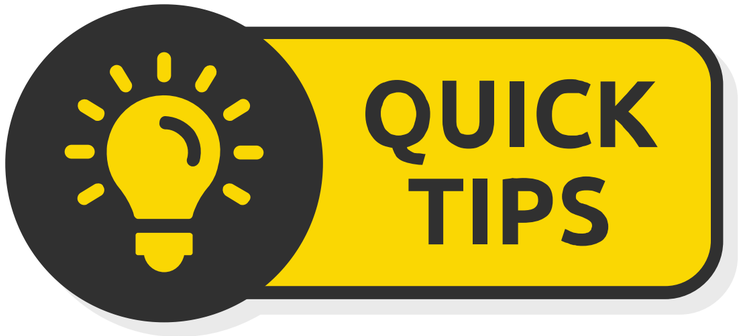
MAINTENANCE

✓ Clean it regularly to prevent contamination.

✓ Check the temperature and CO_2 sensors to make sure they're accurate.

✓ Don't overcrowd it—good airflow is key to keeping temperatures even.



MAINTENANCE

COMMON MISTAKES

❌ Storing too many samples too close together.

❌ Ignoring CO_2 and humidity levels in cell culture incubators.

❌ Not having a backup power plan—because one power failure can ruin weeks of work.

RECAP

- What an incubator does and why it’s important
- Different types of incubators and their uses
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