

MICROBIOLOGICAL INCUBATOR



Microbiological Incubator - ToronCubator™ MB-S Series

ToronCubator™ MB-S is a precision microbiological incubator designed for clean laboratory environments where advanced data management, tight temperature control, and contamination-conscious construction are all required simultaneously. Spanning five chamber volumes from 65 L to 530 L, this laboratory incubator combines a 5-inch color touchscreen, the BRIGHT II intelligent control system, and a 5 cm fully enclosed aluminum foil insulation layer delivering temperature fluctuation as tight as $\pm 0.2^{\circ}\text{C}$ at 37°C alongside the thermal isolation performance that cleanroom-adjacent laboratory settings demand.

The ToronCubator™ MB-S sits above the standard ToronCubator™ EH in the electric heating incubator lineup, adding several capabilities that directly address regulated microbiological workflows. Real-time temperature record curves and alarm history are visible directly on-screen. Data is stored internally for over 10 years and exportable via USB drive. Two RS-485 interfaces and one USB port support integration with external laboratory systems and monitoring platforms. Ten adjustable exhaust rate settings give operators control over internal atmosphere conditions, and multi-level password management restricts parameter access in shared or GMP-adjacent environments.

As a dedicated microbiological laboratory incubator, the ToronCubator™ MB-S is built for microbiology QC labs, pharmaceutical testing environments, food safety facilities, and research institutions where the combination of $\pm 0.2^{\circ}\text{C}$ thermal precision, clean laboratory construction, and long-term audit-ready data storage makes it a meaningfully different instrument from general-purpose laboratory incubators. It also serves as a capable biochemical incubator for multi-phase enzyme and metabolic studies requiring stable, programmable heating across the $\text{RT}+5^{\circ}\text{C}$ to 100°C range.

APPLICATIONS

Microbiological Incubator - ToronCubator™ MB-S Series Applications

The ToronCubator™ MB-S addresses laboratory environments where microbiological precision, data traceability, and clean construction standards are equally important:

- Microbiological Quality Control the primary application for this dedicated microbiological incubator; bacterial culture incubation, colony counting plates, environmental monitoring samples, and bioburden testing in pharmaceutical, food, and clinical QC laboratories
- Pharmaceutical Microbiology sterility testing support, microbial limits testing, and antimicrobial efficacy assay incubation in GMP and regulated laboratory incubators environments where audit-ready data records are a compliance requirement
- Biochemical Research enzyme kinetics, metabolic assays, and temperature-sensitive biochemical incubator protocols requiring tight $\pm 0.2^{\circ}\text{C}$ thermal stability across multi-segment programmed incubation runs
- Food Safety and Microbial Testing total plate count incubation, pathogen detection plate cultures, and spoilage organism growth studies at precisely controlled temperatures in accredited food safety laboratories
- Mould and Fungal Cultivation controlled thermal incubation for mould incubator applications in mycology research, antimicrobial testing, and fungal identification programs where clean-environment construction reduces cross-contamination risk
- Clinical and Diagnostic Microbiology diagnostic culture plate incubation, sensitivity testing, and clinical sample preparation in hospital and reference laboratory settings
- Environmental Monitoring settle plate and active air sampling incubation for controlled manufacturing environments, cleanrooms, and pharmaceutical aseptic processing areas
- Academic Research and Institutional Laboratories advanced general-purpose incubators for multi-user research facilities requiring data logging, access control, and long-term record retention as standard features



FEATURES

Microbiological Incubator - ToronCubator™ MB-S Series Key Features

Control System and Interface

- 5-inch color touchscreen for intuitive parameter entry and direct on-screen access to temperature curves, alarm history, and operational data
- BRIGHT II intelligent control system with automatic environmental parameter compensation for consistent setpoint accuracy under varying ambient conditions
- Real-time temperature record data and curves viewable directly on screen
- Alarm recording information stored and retrievable without external software

Data Management and Connectivity

- Internal non-volatile data storage retaining temperature records and operational data for more than 10 years without SD card dependency
- USB interface for data export to USB drive; timestamped data files for documentation and audit trail purposes
- Two RS-485 interfaces for integration with LIMS, data acquisition systems, and laboratory monitoring networks
- Reservation function for scheduled delayed-start incubation
- Multi-level password management for access control in shared, regulated, or GMP-adjacent environments
- Compatible with optional online monitoring platform for remote data access and centralized logging

Heating and Temperature Performance

- Preheating chamber design for rapid heat-up and efficient heat distribution throughout the working volume

- Temperature operating range: RT+5°C to 100°C
- Temperature fluctuation at 37°C: $\pm 0.2^{\circ}\text{C}$ tightest specification in the ToronCubator™ electric heating lineup
- Temperature uniformity at 37°C: $\pm 0.6^{\circ}\text{C}$
- Heat-up time to 60°C: 15-25 minutes depending on model
- Temperature recovery after 30-second door opening at 60°C: 10-14 minutes depending on model

Airflow and Exhaust Management



- 6-stage fan speed regulation for adjustable forced-convection heat distribution across all shelf positions
- 10 adjustable exhaust rate settings for controlled internal atmosphere management during incubation

Clean Laboratory Construction



- 5 cm fully enclosed aluminum foil insulation layer for improved thermal efficiency and sealed chamber construction suitable for clean laboratory environments
- Double-door design with inner door maintaining chamber barrier during outer door access

Safety and Alarm Systems

- Dual over-temperature alarm protection: primary sensor-controlled alarm circuit plus independent hardware-level temperature control switch as a fully separate backup safety layer

- All alarm events logged and stored for later review on-screen or via data export

Chamber and Physical Design



- Adjustable shelving to accommodate samples of varying height and configuration across all five models
- Mechanical lock for chamber security between access events

Optional Add-Ons

- Embedded printer for on-site hardcopy data record generation
- Online monitoring platform for remote environmental data access and centralized logging
- Inlet and outlet air filter for HEPA-filtered air exchange in cleanroom-adjacent installations

Theory and Method

BRIGHT II Temperature Control and Environmental Compensation

The ToronCubator™ MB-S operates on the BRIGHT II intelligent control platform an upgrade from the BRIGHT I system used in the standard EH series. The BRIGHT II controller continuously monitors the internal chamber temperature sensor and modulates output from the electric resistance heating elements to maintain the programmed setpoint. Temperature resolution is 0.1°C, with fluctuation held to $\pm 0.2^\circ\text{C}$ at 37°C the tightest specification in the ToronCubator™ electric heating lineup. Spatial uniformity at 37°C is within $\pm 0.6^\circ\text{C}$ across the working volume.

The system automatically compensates control parameters in response to changes in ambient room temperature, maintaining setpoint stability without manual recalibration when laboratory environmental conditions shift. This adaptive compensation is particularly relevant in microbiological laboratories where seasonal temperature variation or HVAC fluctuation can affect incubator performance if the control system does not account for ambient conditions.

Preheating Architecture and Airflow Management

A dedicated preheating chamber design accelerates thermal transfer into the working volume, supporting the heat-up and temperature recovery performance specified in the technical data. Heat-up time to 60°C ranges from 15 to 25 minutes depending on model size, and temperature recovery following a 30-second door opening at 60°C is achieved within 10 to 14 minutes. The 6-stage adjustable fan speed circulates heated air throughout the chamber to maintain the $\pm 0.6^\circ\text{C}$ uniformity specification across all shelf positions. Operators select the fan speed appropriate for their sample type lower settings for open culture vessels or moisture-sensitive samples, higher settings for faster post-access recovery.

The 10 adjustable exhaust rate settings give operators additional control over internal atmosphere conditions a feature specifically relevant to microbiological applications where CO₂ buildup, volatile compound accumulation, or controlled atmosphere conditions may need to be managed during extended incubation runs.

Clean Laboratory Construction

The ToronCubator™ MB-S incorporates a 5 cm fully enclosed aluminum foil insulation layer around the working chamber. This construction approach serves two purposes in clean laboratory contexts: it improves thermal insulation efficiency, contributing to tighter temperature stability, and it provides a fully sealed thermal boundary that minimizes particulate ingress pathways into the insulation layer. The double-door design further supports clean-environment use, with the inner door maintaining a barrier between the working chamber and the laboratory space during the brief period when the outer door is open for sample access. An optional inlet and outlet air filter accessory is available for installations requiring HEPA-filtered air exchange.

Data Management and Audit Trail

All temperature records, operational data, and alarm history are stored in non-volatile internal memory with a retention period exceeding 10 years without reliance on SD cards or external storage devices. Real-time temperature curves and alarm records are viewable directly on the 5-inch touchscreen without connecting to an external system. Data export is handled via the onboard USB interface, generating timestamped data files suitable for audit trail documentation in regulated laboratory environments. Two RS-485 interfaces and one USB port support simultaneous connection to external data acquisition systems, LIMS platforms, and online monitoring solutions. Multi-level password management controls access to operational parameters across shared laboratory settings.

TECHNICAL SPECIFICATIONS

Microbiological Incubator - ToronCubator™ MB-S Series Technical Specifications

Parameter	ToronCubator™ MB-65S	ToronCubator™ MB-130S	ToronCubator™ MB-280S	ToronCubator™ MB-450S	ToronCubator™ MB-530S
Chamber Volume (L)	65	130	280	450	530

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Temp. Range (°C)	RT+5 to 100				
Temp. Fluctuation at 37°C (°C)	±0.2				
Temp. Uniformity at 37°C (°C)	±0.6				
Heat-up Time to 60°C (min)	16	20	15	25	25
Recovery After 30s Door Open at 60°C (min)	14	13	10	11	11
Rated Power (W)	550	550	1000	1500	1000
Internal Dimensions W×D×H (mm)	410×350×450	570×400×570	720×530×745	600×580×1300	1070×595×835
External Dimensions W×D×H (mm)	575×615×635	735×665×755	885×795×930	774×845×1574	1235×850×1080
Number of Shelves (Std./Max.)	2/5	2/7	3/9	4/13	3/12
Net Weight / Gross Weight (kg)	52/73	67/88	102/125	150/179	167/190
Package Size (mm)	695×768×787	855×818×907	1005×948×1082	894×1005×1724	854×965×1614



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