

# BASIC HORIZONTAL SHAKER INCUBATOR



# Basic Horizontal Shaker Incubator - ToronShake™ HS-B Series

## Reliable Horizontal Shaking Incubation for the Modern Laboratory

ToronShake™ HS-B Series is a horizontal shaker incubator designed for laboratories that require consistent orbital agitation combined with precise temperature control in a single, floor-standing instrument. Available in three chamber volumes 200 L, 280 L, and 350 L this lab shaker incubator combines the BRIGHT I intelligent operating system, a 7-inch color touch screen, and a high-quality compressor-driven refrigeration system to deliver stable incubation conditions across a broad range of shaking protocols.

With a rotation rate of 30–300 rpm,  $\pm 0.3$  °C temperature fluctuation at 37 °C, and support for up to 30 programmable segments across 999 repeatable cycles, the ToronShake™ HS-B Series serves the full spectrum of laboratory shaker incubator applications from bacterial culture and enzyme kinetics to cell aeration studies and large-volume fermentation trials. An optional humidity-control configuration (ToronShake™ HS-B1 variant) extends capability to protocols requiring defined relative humidity alongside temperature and agitation control.

The ToronShake™ HS-B is offered in three sub-series to match different temperature range and refrigeration requirements. The ToronShake™ HS-B3 operates from RT+5 °C to 60 °C using compressor-free heating. The ToronShake™ HS-2B extends temperature control downward to 4 °C with full compressor refrigeration. The HS-B1 adds humidity control (ambient to 95% RH) on top of the 4–60 °C refrigerated range making it the most capable configuration in the series for moisture-sensitive incubation workflows.

All three sub-series share the same BRIGHT I control platform, orbital shaking mechanism, USB data management, and tempered glass door construction ensuring consistent build quality and operational familiarity across the range.

## APPLICATIONS

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# Basic Horizontal Shaker Incubator - ToronShake™ HS-B Series

## Applications

The ToronShake™ HS-B Series laboratory shaker incubator is suited to a wide range of B2B research, quality control, and production-support applications where controlled temperature and continuous orbital agitation are required simultaneously.

- **Microbiology & Cell Culture:** Bacterial culture incubation, yeast propagation, and cell growth studies requiring consistent aeration and temperature control throughout the incubation period. The 30–300 rpm range and large tray surface area accommodate a wide variety of flask sizes and culture volumes for both standard and high-throughput microbiological workflows.
- **Biochemical & Enzyme Research:** Enzyme kinetics studies, protein solubility assays, substrate-enzyme reaction incubation, and metabolic pathway research requiring stable, programmable temperature conditions combined with defined agitation intensity. The 30-segment programmable profile capability of this incubator shaker allows researchers to define ramp-and-soak sequences and step-change protocols without manual intervention between phases.
- **Fermentation & Bioprocess Development:** Small- to mid-scale fermentation trials, yeast and fungal propagation, and upstream bioprocess development workflows where consistent aeration, temperature uniformity, and long-duration unattended operation are all required from a single shaker incubator platform.
- **Pharmaceutical Research & QC:** Dissolution testing support, biological sample conditioning, solubility screening, and in-process quality control incubation at defined temperatures and agitation rates. The multi-level permission management and USB data export functions support audit trail requirements in regulated pharmaceutical laboratory environments.
- **Molecular Biology:** Hybridization assays, DNA/RNA precipitation, plasmid propagation, and nucleic acid extraction incubation protocols requiring gentle-to-moderate agitation at controlled temperatures across defined time intervals.
- **Food Science & Safety:** Microbiological shelf-life evaluation, spoilage organism culture, fermentation studies, and food safety incubation protocols requiring reproducible combined agitation and temperature conditions over extended timelines.
- **Environmental & Industrial Testing:** Biodegradation studies, environmental sample incubation, and industrial microbiological testing at defined temperature and agitation setpoints supported by the programmable multi-segment profile capability of the ToronShake™ HS-B lab shaker incubator.



## FEATURES

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### **Basic Horizontal Shaker Incubator - ToronShake™ HS-B Series Key Features**



## **Intelligent Control System**

- BRIGHT I intelligent operating system with automatic environmental compensation of control parameters maintains setpoint accuracy under varying ambient laboratory conditions without manual recalibration
- 7-inch color touch screen with real-time display of temperature, agitation rate, program status, and elapsed run time
- Multi-segment programmable design supporting up to 30 segments and 999 repeatable cycles for complex thermal and shaking profile protocols
- Reservation function for delayed-start scheduling of incubation cycles
- Multi-level permission management for access control in shared or regulated laboratory shaker incubator environments

## **Shaking Performance**

- Horizontal orbital shaking mechanism with a fixed Ø26 mm vibration amplitude for consistent, reproducible fluid agitation across all vessel types
- Rotation rate range of 30–300 rpm with  $\pm 1$  rpm accuracy covering gentle rocking through vigorous aeration protocols on a single incubator shaker platform
- DC motor drive for low-noise, stable long-duration shaking performance throughout extended incubation runs

## **Temperature Control**

- Temperature resolution of 0.1 °C across the full operating range
- Temperature fluctuation of  $\pm 0.3$  °C at 37 °C for consistent incubation conditions throughout the working volume
- Temperature uniformity of  $\pm 1$  °C at 37 °C across all tray positions
- High-quality compressor refrigeration (HS-B2 and HS-B1) enabling temperature control down to 4 °C for sub-ambient shaking incubation protocols

## **Humidity Control (ToronShake™ HS-1B)**

- Internal water tank-based humidification system delivering humidity control from ambient levels up to 95% RH
- Humidity fluctuation maintained within  $\pm 3\%$  RH for stable moisture conditions throughout the incubation period

## Data Management & Connectivity

- Onboard data storage supporting up to 1,000,000 records without SD card dependency
- USB interface for data export to external drives; timestamped records suitable for audit trail and compliance documentation
- Event recording function with real-time curve and data viewing directly on the touch screen display

## Chamber & Physical Design

- Tempered glass door with mechanical lock for chamber security and sample visibility between access events
- Single-tray configuration accommodating a wide range of flask and vessel sizes from 50 mL to 5,000 mL
- Three chamber volumes (200 L, 280 L, 350 L) providing scalable capacity from standard research workflows to high-throughput institutional lab shaker incubator applications
- Mobile caster base for easy repositioning within the laboratory

## THEORY & METHOD

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### Theory and Method

**Horizontal Orbital Shaking Mechanism** The ToronShake™ HS-B operates on a horizontal orbital shaking principle in which the tray platform moves in a circular, fixed-radius orbit of Ø26 mm. This orbital motion generates consistent fluid movement within culture vessels promoting dissolved oxygen transfer, nutrient distribution, and waste product removal throughout the culture volume without the mechanical disruption associated with rotary or reciprocating shaker designs. The DC motor driving the orbital mechanism delivers rotation rates from 30 to 300 rpm with an accuracy of  $\pm 1$  rpm, maintaining the programmed agitation setpoint with precision across the full speed range and throughout extended incubation runs.

**BRIGHT I Intelligent Temperature Control** Temperature is governed by the BRIGHT I intelligent operating system, which continuously monitors the internal chamber sensor and modulates output from the heating and refrigeration systems to



maintain the programmed setpoint. BRIGHT I automatically compensates control parameter values in response to real-time ambient environmental changes maintaining setpoint accuracy without manual recalibration when laboratory conditions shift. Temperature resolution is 0.1 °C across the full operating range, with fluctuation held to  $\pm 0.3$  °C and spatial uniformity within  $\pm 1$  °C, both measured at 37 °C.

**Compressor Refrigeration (ToronShake™ HS-2B and ToronShake™ HS-1B)** The ToronShake™ HS-2B and ToronShake™ HS-1B sub-series incorporate a high-quality compressor refrigeration system that extends temperature control below room temperature down to 4 °C enabling incubation protocols that require controlled cooling alongside active orbital agitation. The compressor system operates in conjunction with the BRIGHT I control platform for seamless transition between heating and cooling modes without operator intervention.

**Humidity Control (ToronShake™ HS-1B)** The ToronShake™ HS-1B configuration adds an internal water tank-based humidification system that controls relative humidity from ambient levels up to 95% RH. Humidity fluctuation is maintained within  $\pm 3\%$  RH, providing a stable moisture environment for protocols where evaporative loss from culture vessels or the moisture conditions within the chamber itself affects experimental outcomes.

**Programmable Multi-Segment Profiles** The BRIGHT I platform supports up to 30 programmable segments arranged across 999 repeatable cycles. Operators can define ramp rates, target temperatures, agitation speeds, soak durations, and step transitions to create complex thermal and shaking profiles that run automatically without operator intervention between phases. The reservation function allows delayed-start scheduling, enabling incubation cycles to begin at a predetermined time without manual initiation.

**Data Management and Access Control** All operational events are recorded continuously in an onboard memory system capable of storing up to 1,000,000 data records. Real-time temperature curves, agitation data, and alarm history are viewable directly on the 7-inch touch screen. USB export transfers timestamped data files to external drives for documentation, audit trail, and compliance purposes. Multi-level permission management restricts parameter access to authorized users in shared laboratory shaker incubator environments.

## **TECHNICAL SPECIFICATIONS**

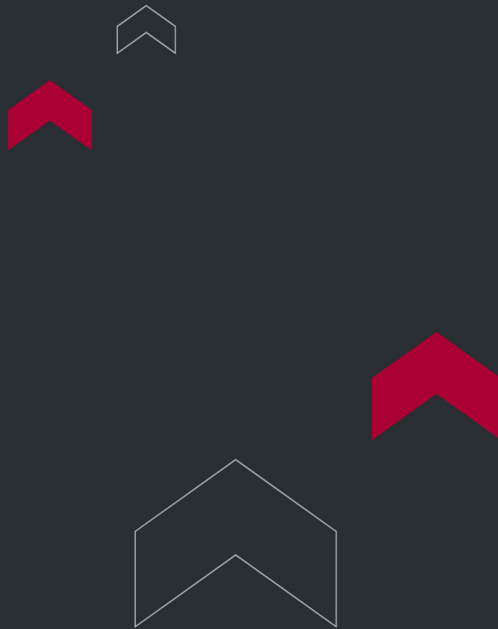
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# Basic Horizontal Shaker Incubator - ToronShake™ HS-B Series Technical Specifications

| Parameter                       | ToronShake™ HS-3350B /ToronShake™ HS-3280B/ ToronShake™ HS-3200B | ToronShake™ HS-2350B /ToronShake™ HS-2280B/ ToronShake™ HS-2200B | ToronShake™ HS-1350B /ToronShake™ HS-1280B/ |
|---------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------|
| Volume (L)                      | 350 / 280 / 200                                                  | 350 / 280 / 200                                                  | 350 / 280                                   |
| Temperature Range (°C)          | RT+5 to 60                                                       | 4 to 60                                                          | 4 to 60                                     |
| Temperature Resolution (°C)     | 0.1                                                              |                                                                  |                                             |
| Temp. Fluctuation at 37 °C (°C) | ±0.3                                                             |                                                                  |                                             |
| Temp. Uniformity at 37 °C (°C)  | ±1                                                               |                                                                  |                                             |
| Humidity Range (%)              | Ambient to 95% RH                                                |                                                                  |                                             |
| Humidity Fluctuation (%)        | ±3                                                               |                                                                  |                                             |
| Rotation Rate (rpm)             | 30–300                                                           |                                                                  |                                             |
| Rotation Accuracy (rpm)         | ±1                                                               |                                                                  |                                             |
| Vibration Amplitude (mm)        | Ø26                                                              |                                                                  |                                             |
| Timer Range (h)                 | 0–999                                                            |                                                                  |                                             |
| Number of Trays                 | 1                                                                |                                                                  |                                             |

| Parameter                      | ToronShake™ HS-3350B /ToronShake™ HS-3280B/ ToronShake™ HS-3200B                   | ToronShake™ HS-2350B /ToronShake™ HS-2280B/ ToronShake™ HS-2200B                   | ToronShake™ HS-1350B /ToronShake™ HS-1280B/                                     |
|--------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Voltage                        | 220V, 50/60 Hz (110V is also available)                                            |                                                                                    |                                                                                 |
| Rated Power (W)                | 1,400 / 1,200 / 1,100                                                              | 1,800 / 1,600 / 1,500                                                              | 2,800 / 2,400                                                                   |
| Internal Dimensions W×D×H (mm) | 1035×675×470 / 1010×590×470 / 1010×590×310                                         | 1035×675×470 / 1010×590×470 / 1010×590×310                                         | 1035×675×470 / 1010×590×470                                                     |
| Housing Dimensions W×D×H (mm)  | 1380×800×1010 / 1350×700×1000 / 1260×730×850                                       | 1380×800×1010 / 1350×700×1000 / 1260×730×850                                       | 1380×800×1010 / 1350×700×1000                                                   |
| Tray Size W×D (mm)             | 970×605 / 950×530 / 950×530                                                        | 970×605 / 950×530 / 950×530                                                        | 970×605 / 950×530                                                               |
| Standard Configuration         | 2000 mL × 8 / 2000 mL × 6 / 500 mL × 20                                            | 2000 mL × 8 / 2000 mL × 6 / 500 mL × 20                                            | 2000 mL × 8 / 2000 mL × 6                                                       |
| Full Load Config. 350 L        | 50×103 / 100×103 / 250×63 / 500×41 / 750×32 / 1000×22 / 2000×15 / 3000×11 / 5000×7 | 50×103 / 100×103 / 250×63 / 500×41 / 750×32 / 1000×22 / 2000×15 / 3000×11 / 5000×7 | 50×71 / 100×71 / 250×45 / 500×37 / 750×29 / 1000×18 / 2000×15 / 3000×8 / 5000×7 |
| Full Load Config. 280 L        | 50×71 / 100×71 / 250×45 / 500×37 / 750×29 / 1000×18 / 2000×15 / 3000×8 / 5000×7    | 50×71 / 100×71 / 250×45 / 500×37 / 750×29 / 1000×18 / 2000×15 / 3000×8 / 5000×7    | 50×71 / 100×71 / 250×45 / 500×37 / 750×29 / 1000×18                             |
| Full Load Config. 200 L        | 50×71 / 100×71 / 250×45 / 500×37 / 750×29 / 1000×18                                | 50×71 / 100×71 / 250×45 / 500×37 / 750×29 / 1000×18                                |                                                                                 |
| Net Weight (lb)                | 595 / 533 / 482                                                                    | 613 / 578 / 503                                                                    | 622 / 587                                                                       |
| Gross Weight (lb)              | 772 / 666 / 545                                                                    | 790 / 710 / 565                                                                    | 799 / 723                                                                       |
| Package Size (in)              | 60.6×39.4×48.8 / 55.5×35.8×47.2 / 55.5×35.8×40.6                                   | 60.6×39.4×48.8 / 55.5×35.8×47.2 / 55.5×35.8×40.6                                   | 60.6×39.4×48.8 / 55.5×35.8×47.2                                                 |

Full load configuration format: flask volume (mL) × number of flasks per tray. Net and gross weights converted from kg. Package dimensions converted from mm to inches.



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