



STACKED SHAKER INCUBATOR

Stacked Shaker Incubator - ToronShake™ ST-S Series

Space-Efficient Stackable Shaking Incubation for High-Throughput Laboratory Workflows

ToronShake™ ST-S Series is a stackable shaker incubator engineered for laboratories that require high-throughput shaking incubation capacity without proportional increases in laboratory floor space. Available in four tray widths 175, 190, 200, and 285 and three sub-series addressing different temperature range and humidity requirements, this lab shaker incubator is designed to be stacked up to three units high on a shared mobile caster base multiplying working capacity vertically while maintaining a compact footprint that a single large horizontal shaker incubator of equivalent total volume could not match.

Each unit in the ToronShake™ ST-S Series operates as a fully independent incubator shaker with its own BRIGHT II intelligent control system, 7-inch touch screen, independent temperature and shaking setpoints, and individual USB data management. Stacking units share a common mobile caster base and structural frame but maintain completely independent environmental control, allowing different protocols to run simultaneously at different temperatures, speeds, and cycle configurations across stacked units in the same laboratory shaker incubator assembly.

The ToronShake™ ST-S Series is offered in three sub-series. The ToronShake™ ST-3S operates from RT+5 °C to 60 °C using heating-only operation without compressor refrigeration suited to protocols that operate at or above room temperature. The ToronShake™ ST-2S adds full compressor refrigeration, extending the temperature range downward to 4 °C for sub-ambient shaking incubation. The ToronShake™ ST-1S further adds humidity control from ambient levels up to 95% RH on top of the 4–60 °C refrigerated range providing the most complete environmental control in the ToronShake™ ST-S stacked laboratory shaker incubator lineup for moisture-sensitive protocols.

All three sub-series share the BRIGHT II intelligent control platform, flip-open door design with movable shaking board, one-piece toughened glass panel, SUS 304 stainless steel waterproof interior, built-in standard and UV lighting, built-in humidification tray, three selectable rotation modes, and 150,000-record USB data management delivering a consistent, full-featured control and construction platform across all stacking configurations.

Note: The standard purchase configuration is one single unit. Stacking of up to three units is supported using the shared mobile caster base. Images in this listing show a three-unit stacked configuration for illustrative purposes.

APPLICATIONS

Stacked Shaker Incubator – ToronShake™ ST-S Series Applications

The ToronShake™ ST-S Series laboratory shaker incubator is suited to research, quality control, and production-support applications where high-throughput shaking incubation capacity is required within a limited laboratory footprint.

- **High-Throughput Microbiology & Cell Culture:** The primary application for this stackable incubator shaker format is bacterial culture incubation, yeast propagation, and cell growth studies across multiple independent protocols running simultaneously in stacked units. The ability to run different temperature and speed setpoints in each stacked unit makes the ToronShake™ ST-S particularly well suited to core laboratory and shared-facility environments where multiple research groups require simultaneous access to shaking incubation capacity.
- **Parallel Screening & Combinatorial Research:** Drug screening, media optimization, growth condition screening, and combinatorial biochemical research workflows requiring large numbers of simultaneous culture conditions across a compact lab shaker incubator footprint. The multi-unit stacking capability allows significantly more parallel culture conditions to be run within a given laboratory space allocation than equivalent single-unit shaker incubator configurations.
- **Biochemical & Enzyme Research:** Enzyme kinetics assays, protein expression studies, solubility screening, and multi-phase biochemical incubator protocols requiring programmable temperature and agitation profiles across 30 segments and 99 cycles per unit. The BRIGHT II platform supports complex protocol design with independent segment programming on each stacked unit simultaneously.
- **Pharmaceutical Research & QC:** Biological sample conditioning, in-process quality control incubation, cell-based assay platforms, and compound solubility screening in regulated pharmaceutical laboratory environments. Multi-level permission management, screen saver with access control, 150,000-record USB data export, and event recording with

curve viewing support audit trail requirements across stacked lab shaker incubator configurations.

- Fermentation & Bioprocess Scale-Up Support: Parallel fermentation condition development, seed train propagation across multiple flask sizes and culture volumes, and upstream bioprocess inoculum preparation where the stackable format of this laboratory shaker incubator provides a practical approach to increasing throughput without expanding the laboratory floor plan.
- Fungal & Mould Research: Fungal cultivation, mould growth studies, and antifungal efficacy testing requiring UV sterilization capability for inter-run decontamination, built-in humidification tray support for moisture-sensitive protocols, and SUS 304 stainless steel waterproof interior construction for easy cleaning between culture runs.
- Food Science & Safety: Spoilage organism culture, shelf-life evaluation, fermentation trials, and food safety microbiological testing across multiple simultaneous conditions supported by independent temperature control on each stacked shaker incubator unit and programmable multi-segment thermal profiles.
- Academic & Institutional Core Laboratories: Shared-access research facilities, teaching laboratories, and multi-user core laboratory environments where the stackable format of the ToronShake™ ST-S provides high aggregate shaking incubation capacity within a space-constrained laboratory infrastructure with multi-level permission management and individual unit data logging to support multi-user accountability.



FEATURES

Stacked Shaker Incubator - ToronShake™ ST-S Series Key Features

Intelligent Control System



- BRIGHT II intelligent operating system with automatic environmental compensation maintains setpoint accuracy under varying ambient laboratory conditions without manual recalibration; an upgrade from the BRIGHT I platform used in the standard horizontal shaker incubator series
- 7-inch color touch screen per unit with real-time display of temperature, shaking speed, program status, and elapsed run time
- 5 independent program slots per unit, each supporting 30 segments and 99 repeatable cycles for complex multi-phase shaking incubation protocol management
- Reservation function for delayed-start scheduling; screen saver with access control to prevent accidental parameter changes during unattended operation
- Multi-level permission management for individual user access control across each stacked unit in shared laboratory shaker incubator environments

Stackable High-Throughput Architecture

- Modular stackable design supporting up to three fully independent incubator shaker units on a shared mobile caster base multiplying shaking incubation capacity vertically without increasing laboratory floor footprint
- Each stacked unit operates completely independently with its own temperature setpoint, shaking speed, program configuration, and data log enabling simultaneous multi-protocol operation in a single stacked lab shaker incubator assembly
- Standard configuration is one single unit; stacking of up to three units supported using the shared caster base and structural frame

Shaking Performance

- Three selectable rotation modes to match agitation pattern to culture vessel type, sample viscosity, and protocol requirements
- Rotation rate range of 20–350 rpm (top position: 20–300 rpm) with ± 1 rpm accuracy across all modes
- Ø26 mm vibration amplitude for consistent orbital fluid motion across flask sizes from 250 mL to 5,000 mL
- Flip-open door design with removable, movable shaking board for straightforward sample loading and chamber access

Temperature Control & Refrigeration

- Temperature resolution of 0.1 °C across the full operating range
- Temperature fluctuation of ± 0.3 °C at 37 °C and uniformity of ± 0.6 °C at 37 °C tighter uniformity than the horizontal shaker incubator platform
- ToronShake™ ST-2S and ToronShake™ ST-1S: full compressor refrigeration enabling temperature control from 4 °C for sub-ambient shaking incubation protocols
- ToronShake™ ST-3S: heating-only operation (RT+5 to 60 °C) for protocols operating at or above room temperature

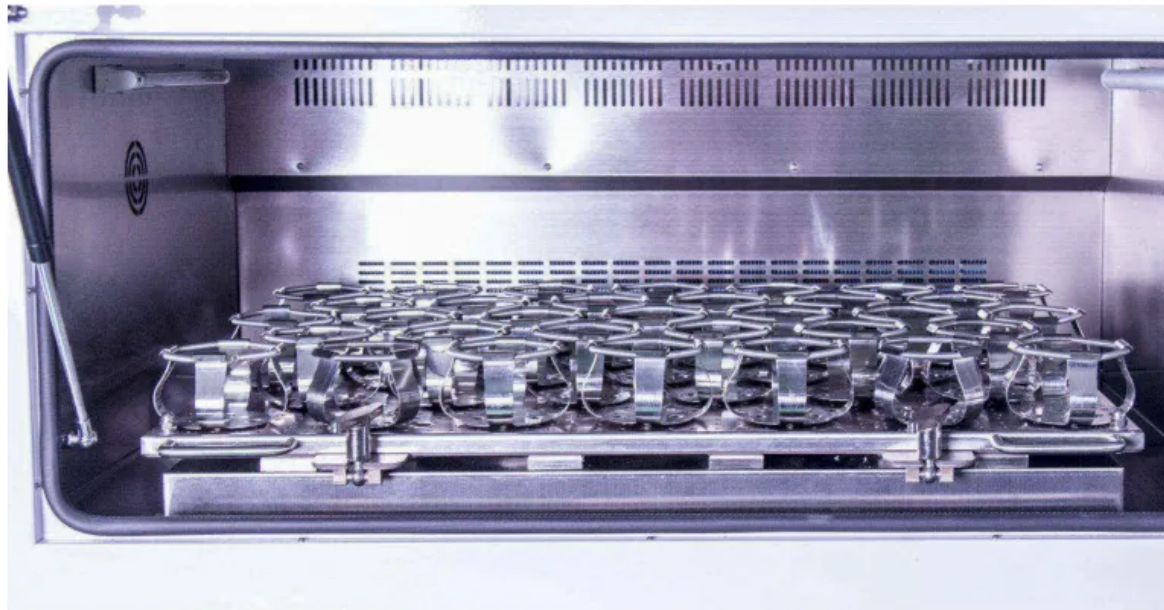
Humidity Control (ToronShake™ ST-1S)



- Built-in humidification tray for passive moisture generation within the working chamber

- Humidity control from ambient levels up to 95% RH with $\pm 5\%$ RH fluctuation
- SUS 304 stainless steel waterproof interior construction accommodates high-humidity operating conditions without corrosion

UV Sterilization & Standard Lighting



- Standard interior lighting and UV germicidal lamp included as standard on every unit not optional add-ons
- Timed UV sterilization function for inter-run chamber decontamination without liquid chemical disinfectants
- One-piece toughened glass panel with viewing window for sample observation without opening the chamber

Data Management & Connectivity

- 150,000-record onboard data storage per unit with USB export for complete timestamped operational records
- Real-time curve display, historical data viewing, and event recording directly on the 7-inch touch screen
- Event recording function with curve and data viewing for on-screen operational review without external software

Chamber & Physical Design



- SUS 304 stainless steel waterproof interior design for easy cleaning and resistance to media spills during shaking incubation
- One-piece toughened glass panel for structural integrity and clear chamber observation
- Exhaust outlet for internal atmosphere management during operation
- Gated button controls for operational safety during active shaking incubation runs
- Mobile caster base for easy repositioning of the complete stacked assembly within the laboratory

Theory and Method

Stackable Independent Shaking Incubator Architecture The ToronShake™ ST-S Series is built around a modular stacking architecture in which each unit functions as a fully independent incubator shaker with its own sealed working chamber, independent BRIGHT II control system, individual temperature and shaking setpoints, and separate data management. Units are mechanically stacked and secured on a shared structural frame mounted on a mobile caster base allowing the stack to be repositioned as a single assembly within the laboratory while each unit maintains completely independent operation.

This independence is the defining operational advantage of the stacked shaker incubator format over a single large-volume horizontal shaker: multiple protocols at different temperatures, speeds, and program states can run simultaneously within the same floor footprint, without one unit's door-opening event or setpoint change affecting adjacent units in the stack.

Three Selectable Rotation Modes The ToronShake™ ST-S provides three selectable orbital rotation modes, allowing operators to match the agitation pattern to the specific requirements of their culture vessel type, sample viscosity, and protocol. The rotation rate range is 20–350 rpm across standard shelf positions, with the top-position tray limited to 20–300 rpm to account for the mechanical dynamics of the uppermost position in a stacked configuration. Rotation accuracy is maintained at ± 1 rpm across all modes and speed settings. The $\varnothing 26$ mm vibration amplitude delivers consistent orbital fluid motion across all flask sizes from 250 mL to 5,000 mL.

BRIGHT II Intelligent Temperature Control Temperature is governed by the BRIGHT II intelligent operating system an upgrade from the BRIGHT I platform used in other ToronShake™ series which continuously monitors the internal chamber sensor and modulates output from the heating and refrigeration systems to maintain the programmed setpoint. BRIGHT II 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, with fluctuation held to ± 0.3 °C and spatial uniformity within ± 0.6 °C, both measured at 37 °C tighter uniformity than the horizontal shaker incubator platform, reflecting the compact working volume of each individual stacked unit.

Compressor Refrigeration (ToronShake™ ST-2S and ToronShake™ ST-1S) The ToronShake™ ST-2S and ToronShake™ ST-1S sub-series incorporate compressor refrigeration that extends temperature control from 4 °C enabling sub-ambient shaking incubation protocols in a stacked format. Each unit in a mixed stack can operate at a different temperature setpoint independently, making it possible to run both ambient-temperature and refrigerated protocols simultaneously within a single stacked lab shaker incubator assembly.

Humidity Control with Built-In Humidification Tray (ToronShake™ ST-1S) The ToronShake™ ST-1S configuration adds humidity control from ambient levels up to 95% RH with fluctuation maintained within $\pm 5\%$ RH. A built-in humidification tray generates moisture passively within the working chamber supporting protocols where evaporative loss from culture vessels over extended shaking incubation runs would alter media concentration or osmolality. The SUS 304 stainless steel waterproof interior construction accommodates the moisture conditions associated with high-humidity operation without corrosion or cleaning difficulty.

UV Germicidal Sterilization and Standard Lighting Every unit in the ToronShake™ ST-S Series is equipped as standard with both interior illumination lighting and a UV germicidal lamp. UV sterilization supports timed inter-run decontamination of the working chamber interior reducing microbial load on interior surfaces between culture runs without liquid chemical disinfectants. The one-piece toughened glass panel and viewing window allow sample observation without opening the chamber during active incubation and UV cycles. The flip-open door design with movable shaking board supports straightforward sample access and chamber cleaning between runs.

Programmable Multi-Segment Profiles with Reservation Scheduling The BRIGHT II platform on each unit supports 5 independent program slots, each with up to 30 configurable segments across 99 repeatable cycles providing flexible protocol design for ramp-and-soak sequences, step-change temperature profiles, and multi-phase shaking incubation programs that run automatically without operator intervention. The reservation function allows delayed-start scheduling, and the screen saver with access control prevents accidental parameter changes during unattended operation in shared laboratory environments.

Data Management and Access Control Operational events on each individual unit are recorded continuously in onboard memory supporting 150,000 data records. Real-time curves, historical data, and event logs are viewable directly on the 7-inch touch screen. USB export transfers complete timestamped data files for documentation, audit trail, and compliance

purposes. Multi-level permission management restricts parameter access across each unit independently supporting individual user accountability in shared or regulated laboratory shaker incubator environments.

TECHNICAL SPECIFICATIONS

Stacked Shaker Incubator – ToronShake™ ST-S Series Technical Specifications

ToronShake™ ST-3S Series Heating Only (RT+5 to 60 °C)

Parameter	ToronShake™ ST-3285S	ToronShake™ ST-3200S	ToronShake™ ST-3190S	ToronShake™ ST-3275S
Temperature Range (°F / °C)	RT+9 to 140 °F (RT+5 to 60 °C)			
Temperature Resolution (°F / °C)	0.18 °F (0.1 °C)			
Temp. Fluctuation at 37 °C (°F / °C)	±0.54 °F (±0.3 °C)			
Temp. Uniformity at 37 °C (°F / °C)	±1.08 °F (±0.6 °C)			
Rotation Rate (rpm)	20–350 (top: 20–300)			
Rotation Accuracy (rpm)	±1			
Vibration Amplitude (in / mm)	1.02 in (Ø26 mm)			
Timer Range (h)	0–999			
Voltage	220V, 50/60 Hz (110V is also available)			
Rated Power (W)	1,600	550	1,000	550
Internal Dimensions W×D×H (in)	38.0×24.8×18.1	24.0×23.2×21.9	28.3×22.4×18.1	24.0×23.2×18.9

Parameter	ToronShake™ ST-3285S	ToronShake™ ST-3200S	ToronShake™ ST-3190S	ToronShake™ ST-3275S
Housing Dimensions W×D×H (in)	53.5×32.7×24.4	34.3×29.7×28.7	44.1×31.1×24.4	35.0×30.0×25.6
Tray Size W×D (in)	32.9×20.3	18.9×18.5	24.2×18.3	18.9×18.5
Standard Config. (single layer)	500 mL×33	500 mL×16	500 mL×21	500 mL×16
Net Weight (lb)	573	320	485	353
Gross Weight (lb)	750	496	661	529

ToronShake™ ST-2S Series Refrigerated, No Humidity (4-60 °C)

Parameter	ToronShake™ ST-2285S	ToronShake™ ST-2200S	ToronShake™ ST-2190S	ToronShake™ ST-2275S
Temperature Range (°F / °C)	39–140 °F (4–60 °C)			
Temperature Resolution (°F / °C)	0.18 °F (0.1 °C)			
Temp. Fluctuation at 37 °C	±0.54 °F (±0.3 °C)			
Temp. Uniformity at 37 °C	±1.08 °F (±0.6 °C)			
Rotation Rate (rpm)	20–350 (top: 20–300)			
Rotation Accuracy (rpm)	±1			
Vibration Amplitude (in / mm)	1.02 in (Ø26 mm)			
Timer Range (h)	0–999			
Voltage	220V, 50/60 Hz (110V is also available)			
Rated Power (W)	1,800	650	1,200	650
Internal Dimensions W×D×H (in)	38.0×24.8×18.1	24.0×23.2×21.9	28.3×22.4×18.1	24.0×23.2×18.9
Housing Dimensions W×D×H (in)	53.5×32.7×24.4	34.3×29.7×28.7	44.1×31.1×24.4	35.0×30.0×25.6

Parameter	ToronShake™ ST-2285S	ToronShake™ ST-2200S	ToronShake™ ST-2190S	ToronShake™ ST-2275S
Tray Size W×D (in)	32.9×20.3	18.9×18.5	24.2×18.3	18.9×18.5
Standard Config. (single layer)	500 mL×33	500 mL×16	500 mL×21	500 mL×16
Net Weight (lb)	595	364	507	353
Gross Weight (lb)	772	540	683	529

ToronShake™ ST-1S Series Refrigerated with Humidity Control (4-60 °C, up to 95% RH)

Parameter	ToronShake™ ST-1285S	ToronShake™ ST-1200S	ToronShake™ ST-1190S	ToronShake™ ST-1275S
Temperature Range (°F / °C)	39–140 °F (4–60 °C)			
Temperature Resolution (°F / °C)	0.18 °F (0.1 °C)			
Temp. Fluctuation at 37 °C	±0.54 °F (±0.3 °C)			
Temp. Uniformity at 37 °C	±1.08 °F (±0.6 °C)			
Humidity Range (%)	Ambient to 95% RH			
Humidity Fluctuation (%)	±5			
Rotation Rate (rpm)	20–350 (top: 20–300)			
Rotation Accuracy (rpm)	±1			
Vibration Amplitude (in / mm)	1.02 in (Ø26 mm)			
Timer Range (h)	0–999			
Voltage	220V, 50/60 Hz (110V is also available)			
Rated Power (W)	1,850	700	1,250	700
Internal Dimensions W×D×H (in)	38.0×24.8×18.1	24.0×23.2×21.9	28.3×22.4×18.1	24.0×23.2×18.9

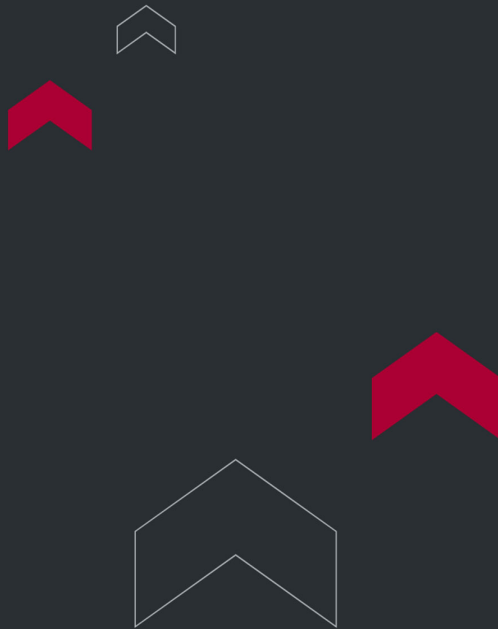
Parameter	ToronShake™ ST-1285S	ToronShake™ ST-1200S	ToronShake™ ST-1190S	ToronShake™ ST-1275S
Housing Dimensions W×D×H (in)	53.5×32.7×24.4	34.3×29.7×28.7	44.1×31.1×24.4	35.0×30.0×25.6
Tray Size W×D (in)	32.9×20.3	18.9×18.5	24.2×18.3	18.9×18.5
Standard Config. (single layer)	500 mL×33	500 mL×16	500 mL×21	500 mL×16
Net Weight (lb)	606	375	518	364
Gross Weight (lb)	783	771	694	540

Full Load Configuration (Single Layer) All Sub-Series

Tray Width	Full Load Configuration (mL × flasks)
285	250×60 / 500×40 / 1000×20 / 2000×11 or 250×55 / 500×33 / 1000×18 / 2000×15
200	250×25 / 500×16 / 1000×9 / 2000×5 / 3000×5 / 5000×4 or 250×25 / 500×16 / 1000×9 / 2000×5 / 3000×4 / 5000×2
190	250×32 / 500×21 / 1000×13 / 2000×7 or 250×32 / 500×20 / 1000×12 / 2000×8
175	250×25 / 500×16 / 1000×9 / 2000×5 or 250×25 / 500×16 / 1000×9 / 2000×5

Package Dimensions All Models

Configuration	Package Size (in)
285-tray models	1518.9 × 990.6 × 830.6
200-tray models	929.6 × 1021.1 × 929.6
190-tray models	1285.2 × 950.0 × 810.3
175-tray models	929.6 × 1021.1 × 850.9



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