



# INTELLIGENT VERTICAL SHAKER INCUBATOR

# Intelligent Vertical Shaker Incubator - ToronShake™ VI

ToronShake™ VI is a floor-standing intelligent vertical shaker incubator designed for high-throughput laboratory environments that require large-capacity orbital agitation, precision temperature control, and comprehensive data management in a single instrument. Available across three sub-series ToronShake™ VI-3 (ambient start), ToronShake™ VI-2 (refrigerated), and ToronShake™ VI-1 (refrigerated with active humidity control) and eight individual models spanning 200 L to 600 L, this laboratory shaker incubator combines the BRIGHT I intelligent control system, a 7-inch touch screen, 30-segment/999-cycle programmability, 1-million-record USB data storage, and an inverter compressor for sustained, efficient long-duration incubation shaker operation. For pharmaceutical, biotechnology, and research institutions that have outgrown benchtop shaker incubators, the ToronShake™ VI provides the capacity and intelligence to scale workflows without sacrificing precision.

The ToronShake™ VI is a large-format floor-standing vertical shaker incubator engineered for research institutions, biotechnology companies, and pharmaceutical laboratories that require sustained high-throughput orbital agitation across large sample volumes. Eight models across three sub-series ranging from 200 L to 600 L provide a scalable selection for organizations moving from benchtop lab shaker incubators to floor-standing production and research-scale platforms.

The BRIGHT I intelligent operating system governs all thermal, agitation, and humidity parameters, automatically compensating control values in response to real-time environmental changes. A 7-inch full-color touch screen displays real-time operational parameters current temperature, speed, humidity (ToronShake™ VI-1 series), elapsed time, and program status with continuous live readout throughout the run. Multi-level permission operation assigns differentiated access rights to different user roles, and an event recording function timestamps all operational events, alarm activations, and parameter changes for complete run traceability.

The 1-million-record USB data storage system is the largest in the ToronShake™ lineup ten times the capacity of the ToronShake™ IPX and supports USB drive export for audit trail documentation, regulatory submissions, and long-term data archiving. Curve and data viewing functions allow researchers to review historical run data and overlay multiple run curves directly on the touch screen without requiring a separate computer or data management software.

Each model is fitted with tempered glass doors with mechanical locks single door on ToronShake™ VI-3 and ToronShake™ VI-2 models, double door on the ToronShake™ VI-1 600 L model providing a clear view of the chamber interior during active runs without opening the door. The high-quality inverter compressor adjusts its output in response to thermal load rather than cycling on and off at full power, reducing energy consumption and acoustic output while extending compressor service life across sustained long-duration shaker incubation campaigns.

## APPLICATIONS

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### Intelligent Vertical Shaker Incubator - ToronShake™ VI Applications

The ToronShake™ VI is suited to high-throughput and large-volume B2B laboratory applications where a desktop or benchtop shaker incubator is insufficient. Its three sub-series expand its reach from standard aerobic culture through humidity-controlled fungal and environmental simulation protocols.

- Large-Scale Microbial Culture: high-throughput aerobic bacterial, yeast, and fungal culture requiring orbital agitation across hundreds of flasks simultaneously with precise temperature and on ToronShake™ VI-1 humidity control.
- Pharmaceutical Biologics: upstream bioprocess development, cell-based assay scale-up, and biologics production support requiring 1-million-record data logging and multi-level access control for GMP-adjacent environments.
- Fermentation Research: multi-flask fermentation studies requiring sustained orbital agitation, programmable temperature profiles, and long-duration unattended operation with calendar reservation scheduling.
- Environmental & Humidity Testing: ToronShake™ VI-1 series humidity-controlled incubation shaker protocols for mould propagation, environmental sample incubation, and material testing under defined temperature and RH conditions simultaneously.
- Biochemical & Enzyme Research: large-volume enzyme production, substrate reaction studies, and protein expression workflows requiring multi-segment programmable thermal profiles and high flask-count orbital agitation.
- Regulatory & Regulated Research: GLP-, GMP-, and ISO 17025-adjacent laboratory shaker incubator workflows requiring timestamped event logs, USB audit trail export, and multi-level user permission controls.



## FEATURES

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# Intelligent Vertical Shaker Incubator – ToronShake™ VI Key Features

## Intelligent Control and Data Management

- BRIGHT I intelligent operating system with automatic environmental compensation of control parameters throughout active runs
- 7-inch full-color touch screen displaying real-time temperature, speed, humidity (ToronShake™ VI-1), and program status parameters
- 30-segment / 999-cycle programmable profiles for complex multi-phase agitation and temperature (and humidity) protocols
- Reservation function for scheduled delayed-start operation; 0–9999 h timer for multi-day and multi-week unattended campaigns
- 1-million-record USB data storage with USB drive export the highest data capacity in the ToronShake™ lineup
- Event recording function with timestamped logs of all parameter changes, alarm events, and operational actions for full run traceability
- Curve and historical data viewing directly on the touch screen without requiring external software
- Multi-level permission operation for differentiated user access rights prevents unauthorized changes during active large-scale shaker incubation runs

## Mechanical and Refrigeration

- High-quality inverter compressor (ToronShake™ VI-1, ToronShake™ VI-2) modulates output in response to thermal load for energy efficiency and extended service life
- DC motor orbital drive with rotation rate 30–300 rpm ( $\pm 1$  rpm accuracy) and amplitude  $\Phi 26$  mm or  $\Phi 35$  mm depending on model
- Two-tray platform design maximizes flask capacity within the vertical chamber footprint
- Tempered glass doors with mechanical locks for chamber security and clear interior observation during active runs

- Humidity control with integrated water tank on ToronShake™ VI-1 series: ambient to 95% RH, fluctuation  $\pm 3\%$  RH
- Universal adjustable casters for safe repositioning of floor-standing units within the laboratory

## THEORY & METHOD

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# Theory and Method

### **BRIGHT I Intelligent Control with Environmental Compensation**

The BRIGHT I platform monitors real-time ambient conditions and automatically adjusts temperature, humidity (ToronShake™ VI-1), and agitation control parameters to compensate for environmental fluctuations maintaining set-point accuracy without manual recalibration. All operational events, parameter changes, and alarm activations are timestamped and stored within the 1-million-record data system, providing a searchable, exportable run history via USB drive. Multi-level permission operation assigns differentiated access rights per user role, preventing unauthorized parameter changes during active large-scale shaker incubation campaigns.

### **30-Segment / 999-Cycle Programmable Profiles**

The ToronShake™ VI supports up to 30 configurable segments per program, repeatable across 999 cycles, the highest cycle count in the ToronShake™ lineup. Each segment defines target temperature, agitation speed, humidity (ToronShake™ VI-1), and duration, enabling fully automated multi-phase incubation protocols that run continuously without operator intervention between phases. A reservation function allows scheduled delayed starts, while the 0-9999 hour timer range supports multi-day and multi-week unattended shaker incubation campaigns. This programmability is particularly relevant for fermentation, large-scale protein expression, and environmental simulation protocols.

### **Inverter Compressor Refrigeration (ToronShake™ VI-1 and ToronShake™ VI-2)**

The ToronShake™ VI-1 and ToronShake™ VI-2 sub-series use a high-quality inverter compressor that modulates its output speed in response to real-time thermal load rather than cycling at full power. This variable-speed approach reduces energy consumption during low-load periods, minimizes temperature fluctuation during compressor transitions, and significantly extends compressor service life compared to fixed-speed alternatives, a meaningful operational advantage for floor-standing laboratory shaker incubators running continuous multi-week campaigns. Temperature fluctuation is rated at  $\pm 0.3$  °C at 37 °C across all sub-series.

### **Active Humidity Control ToronShake™ VI-1 Series**

The ToronShake™ VI-1 series adds active humidity regulation through an integrated water tank and humidification system. Relative humidity is controlled from ambient up to 95% RH with a fluctuation of  $\pm 3\%$  RH, allowing researchers to define and maintain both temperature and humidity set-points simultaneously throughout the shaker incubation run. This makes the ToronShake™ VI-1 the only model in the ToronShake™ lineup capable of running humidity-controlled large-volume orbital agitation protocols suited to mould propagation, fungal ecology, environmental sample incubation, and material degradation studies where RH is a controlled independent variable alongside temperature.

### **DC Motor Orbital Agitation**

All ToronShake™ VI models use a DC motor driving orbital oscillation across a two-tray platform. Rotation rate is adjustable from 30 to 300 rpm with  $\pm 1$  rpm accuracy. Vibration amplitude is  $\Phi 26$  mm for most models, with  $\Phi 35$  mm available on the 600 L ToronShake™ VI-2 and both ToronShake™ VI-1 models providing a larger orbital radius for applications that require stronger mixing intensity in larger-format flask configurations. The two-tray design maximizes flask capacity within the vertical chamber footprint, allowing simultaneous incubation of up to  $164 \times 50$  mL or  $36 \times 1000$  mL flasks in the 600 L configuration.

## **TECHNICAL SPECIFICATIONS**

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# Intelligent Vertical Shaker Incubator - ToronShake™ VI Technical Specifications

Specifications are presented by sub-series. Where multiple values appear (e.g. 600/400/200), they correspond to the 600 L / 400 L / 200 L model within that sub-series.

| Parameter                  | ToronShake™ VI-3<br><br>ToronShake™ VI-3600 / ToronShake™ VI-3400 / ToronShake™ VI-3200) | ToronShake™ VI-2<br><br>(ToronShake™ VI-2600 / ToronShake™ VI-2400 / ToronShake™ VI-2200) | ToronShake™ VI-1<br><br>(ToronShake™ VI-1600 / ToronShake™ VI-1400) |
|----------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Chamber Volume             | 600 L / 400 L / 200 L                                                                    | 600 L / 400 L / 200 L                                                                     | 600 L / 400 L                                                       |
| Temperature Range          | RT+5 to 60 °C                                                                            | 4 to 60 °C                                                                                | 4 to 60 °C                                                          |
| Temperature Resolution     | 0.1 °C                                                                                   |                                                                                           |                                                                     |
| Temp. Fluctuation at 37 °C | ±0.3 °C                                                                                  |                                                                                           |                                                                     |
| Temp. Uniformity at 37 °C  | ±1.0 °C                                                                                  |                                                                                           |                                                                     |
| Humidity Range             | —                                                                                        | —                                                                                         | Ambient to 95% RH                                                   |
| Humidity Fluctuation       | —                                                                                        | —                                                                                         | ±3% RH                                                              |
| Rotation Rate              | 30–300 rpm                                                                               |                                                                                           |                                                                     |
| Rotation Accuracy          | ±1 rpm                                                                                   |                                                                                           |                                                                     |
| Vibration Amplitude        | Φ26 / Φ26 / Φ26 mm                                                                       | Φ35 / Φ26 / Φ26 mm                                                                        | Φ35 / Φ26 mm                                                        |
| Timer Range                | 0–9999 h                                                                                 |                                                                                           |                                                                     |

| Parameter                    | ToronShake™ VI-3<br><br>ToronShake™ VI-3600 / ToronShake™ VI-3400 / ToronShake™ VI-3200) | ToronShake™ VI-2<br><br>(ToronShake™ VI-2600 / ToronShake™ VI-2400 / ToronShake™ VI-2200) | ToronShake™ VI-1<br><br>(ToronShake™ VI-1600 / ToronShake™ VI-1400) |
|------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Number of Trays              | 2                                                                                        |                                                                                           |                                                                     |
| Rated Power                  | 1600 / 1400 / 1000 W                                                                     | 1800 / 1600 / 1200 W                                                                      | 2800 / 2600 W                                                       |
| Voltage                      | 220V, 50/60Hz (110V is also available)                                                   |                                                                                           |                                                                     |
| Internal Dimensions<br>W×D×H | 1100×665×830 / 860×580×800 / 630×490×640 mm                                              | 1100×665×830 / 860×580×800 / 630×490×640 mm                                               | 1100×665×830 / 860×580×800 mm                                       |
| Housing Dimensions<br>W×D×H  | 1430×825×1590 / 1200×740×1500 / 730×685×1300 mm                                          | 1430×825×1590 / 1200×740×1500 / 730×685×1300 mm                                           | 1430×825×1590 / 1200×740×1500 mm                                    |
| Tray Size W×D                | 970×560 / 755×478 / 530×410 mm                                                           | 970×560 / 755×478 / 530×410 mm                                                            | 970×560 / 755×478 mm                                                |
| Standard Configuration       | 250×35 & 500×35 / 250×52 / 250×20                                                        | 250×35 & 500×35 / 250×52 / 250×20                                                         | 250×35 & 500×35 / 250×52                                            |
| Net Weight                   | 430 / 311 / 193 kg                                                                       | 450 / 330 / 212 kg                                                                        | 468 / 348 kg                                                        |
| Gross Weight                 | 545 / 391 / 239 kg                                                                       | 565 / 410 / 258 kg                                                                        | 583 / 428 kg                                                        |
| Package Size<br>W×D×H        | 1590×995×1820 / 1350×910×1730 / 890×845×1520 mm                                          | 1590×995×1820 / 1350×910×1730 / 890×845×1520 mm                                           | 1590×995×1820 / 1350×910×1730 mm                                    |

## Full Load Flask Configuration Reference

All models support multiple flask sizes across two trays. The table below shows maximum flask capacity per chamber volume across all sub-series.

| Chamber Volume | Full Load Configuration (mL × pcs)                    |
|----------------|-------------------------------------------------------|
| 600 L          | 50×164 / 100×164 / 250×90 / 500×74 / 750×52 / 1000×36 |

| Chamber Volume                                  | Full Load Configuration (mL × pcs)                    |
|-------------------------------------------------|-------------------------------------------------------|
| 400 L                                           | 50×104 / 100×104 / 250×66 / 500×50 / 750×36 / 1000×26 |
| 200 L (ToronShake™ VI-3, ToronShake™ VI-2 only) | 50×60 / 100×60 / 250×38 / 500×26 / 750×20             |



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