

DESKTOP INCUBATOR SHAKER



Desktop Incubator Shaker - ToronShake™ IS-D Series

ToronShake™ IS-D is a desktop incubator shaker designed for B2B laboratories that need simultaneous temperature control and orbital agitation in a single compact instrument. Available in four configurations from 18 L to 70 L, this laboratory shaker incubator delivers orbital oscillation at 30–300 rpm with infinitely adjustable amplitude up to $\Phi 40$ mm, a PID-controlled temperature range of 5–60 °C (refrigerated) or RT+5–60 °C (ambient), and a brushless DC motor for low-noise, long-life performance. For microbiology, biochemical, and cell culture workflows that require aeration, mixing, and incubation to run simultaneously, the ToronShake™ IS-D consolidates two instruments into one reliable benchtop platform.

The ToronShake™ IS-D is a compact desktop shaker incubator built for laboratory workflows where orbital agitation and temperature-controlled incubation must run concurrently. Four models (ToronShake™ IS-170D, ToronShake™ IS-270D, ToronShake™ IS-245D, and ToronShake™ IS-218D) span chamber volumes of 18 L to 70 L, with tray sizes ranging from 290×260 mm to 440×390 mm to accommodate a variety of flask and vessel configurations used in routine shaker incubator protocols.

The ToronShake™ IS-170D is a refrigerated shaker incubator with a temperature range starting at 5 °C suitable for cold-temperature culture work and applications requiring below-ambient incubation. The ToronShake™ IS-270D, ToronShake™ IS-245D, and ToronShake™ IS-218D are ambient-start models with a range of RT+5 to 60 °C, covering standard physiological and elevated-temperature incubation workflows. All four models use a single-shaft drive mechanism with orbital oscillation mode and a brushless DC motor, providing smooth, consistent platform motion across the full speed range of 30–300 rpm.

The PMMA II control system manages both temperature and oscillation parameters through an LCD display that shows both set and actual values simultaneously. Operating parameters are protected by an encryption and memory function preventing accidental modification of active run settings in shared laboratory shaker incubator environments. An intelligent audible and visual alarm system alerts operators to out-of-range conditions during active runs. The electrostatic spray-plastic housing pairs with a mirror stainless steel inner chamber and a toughened glass observation window for durability, cleanability, and clear sample visibility without opening the unit.

A fresh air inlet port supports passive gas exchange within the chamber during extended incubation runs. The power-off recovery function automatically restores all operating parameters such as speed, temperature, and timer settings. When power is reinstated after an interruption, protecting long-duration shaker incubation protocols from data loss and parameter reset.

APPLICATIONS

Desktop Incubator Shaker - ToronShake™ IS-D Series Applications

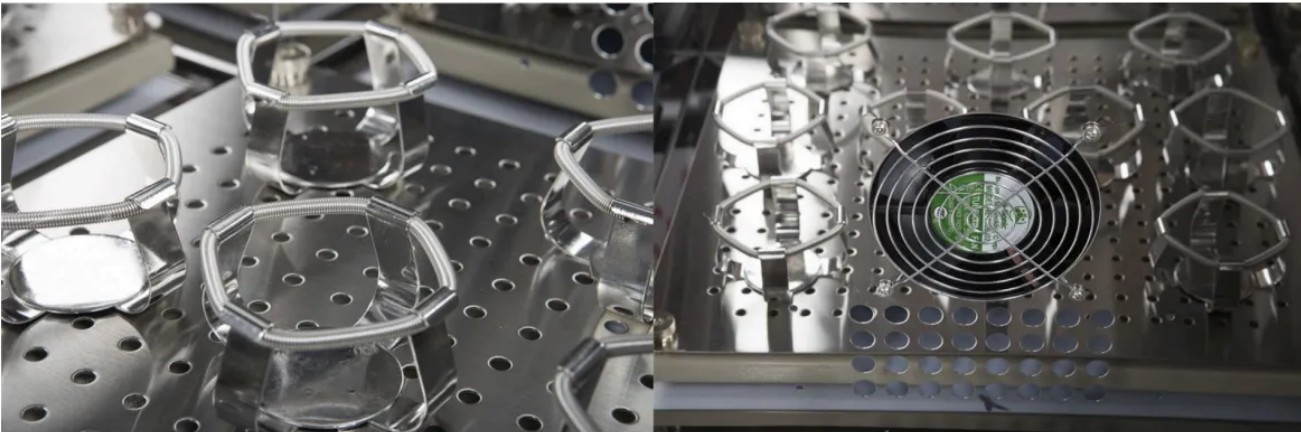
The ToronShake™ IS-D is suited to a wide range of B2B laboratory workflows where simultaneous agitation and temperature control are required. Its compact desktop footprint and broad flask compatibility make it a versatile lab shaker incubator across multiple scientific disciplines.

- Microbial Culture: aerobic bacterial and yeast culture requiring continuous orbital agitation for oxygenation and nutrient distribution alongside precise temperature control.
- Biochemical Assays: enzyme kinetics, substrate reaction assays, and protein expression studies that require mixing and controlled-temperature incubation throughout the reaction period.
- Cell Biology: suspension cell culture, cell growth studies, and hybridoma production in flasks requiring gentle but continuous orbital motion at physiological temperatures.
- Molecular Biology: hybridization, blotting, and nucleic acid preparation workflows requiring timed, temperature-controlled agitation in a laboratory shaker incubator format.
- Pharmaceutical Research
- Drug solubility screening, dissolution studies, and formulation testing requiring reproducible agitation speed and temperature across defined run times.
- Environmental & Food Testing
- BOD incubation with agitation, fermentation studies, and microbiological quality control testing where aeration and warming must occur simultaneously.



FEATURES

Desktop Incubator Shaker - ToronShake™ IS-D Series Key Features



- Single-shaft orbital drive with infinitely adjustable oscillation amplitude ($\Phi 0-40$ mm) and speed range of 30–300 rpm for versatile agitation control
- Brushless DC motor for low-noise, long-service-life orbital motion with consistent torque across the full speed range
- PID temperature control for precise, overshoot-minimized thermal management throughout active shaker incubation runs
- PMMA II control system with LCD display showing both set and actual parameters simultaneously for at-a-glance run verification
- Operating parameter encryption and memory function to prevent accidental modification of active run settings in shared laboratory environments
- Intelligent audible and visual alarm system for temperature deviation and out-of-range condition alerts during active incubation shaker runs

- Power-off recovery function automatically restores all operating parameters when power is reinstated no manual reprogramming required after interruption



- Electrostatic spray-plastic housing with mirror stainless steel inner chamber and toughened glass observation window for durability and clear sample visibility
- Fresh air inlet port for passive gas exchange during extended shaker incubator protocols requiring continuous aeration
- ToronShake™ IS-170D supports refrigerated operation from 5 °C; ToronShake™ IS-270D, ToronShake™ IS-245D, and ToronShake™ IS-218D operate from RT+5 °C

THEORY & METHOD

Theory and Method

Single-Shaft Orbital Drive Brushless DC Motor

The ToronShake™ IS-D uses a single-shaft drive mechanism to generate orbital motion across the platform tray. The oscillation mode is orbital (the platform traces a circular path in a fixed horizontal plane) which promotes efficient gas transfer and nutrient mixing in shake flasks without the violent agitation of reciprocating shakers. Rotation rate is adjustable from 30 to 300 rpm, and amplitude is infinitely adjustable from $\Phi 0$ to $\Phi 40$ mm, giving users control over both the speed and radius of the orbital path to match the agitation intensity required by their culture or assay conditions. The brushless DC motor provides low acoustic output, extended service life, and consistent torque across the full speed range without the brush wear associated with conventional motor designs.

PID Temperature Control

Temperature is regulated using a PID (Proportional-Integral-Derivative) control algorithm, which continuously calculates the difference between the measured and set-point temperatures and adjusts heating (or cooling, on the ToronShake™ IS-170D) output to minimize overshoot and steady-state error. Temperature resolution is 0.1 °C, and uniformity at 37 °C is rated at ± 1.0 °C across the platform surface. The LCD display simultaneously shows both the set temperature and the actual measured temperature, allowing users to confirm that the set-point has been reached and maintained without accessing a separate menu. The PID approach is standard for laboratory shaker incubators where temperature excursions during agitation runs could affect cell viability or reaction kinetics.

PMMA II Parameter Management and Security

The PMMA II control system manages all operating parameters such as temperature set-point, oscillation speed, amplitude, and timer also presents both configured and real-time measured values on the LCD display simultaneously. An encryption and memory function protects active parameter configurations from accidental modification during runs, a practical safeguard in shared laboratory shaker incubator environments where multiple users access the same instrument. All parameters are retained in memory between power cycles. The intelligent audible and visual alarm system triggers alerts for

temperature deviations and other out-of-range conditions, notifying operators immediately rather than relying on manual monitoring of the LCD display.

Power-Off Recovery

The power-off recovery function restores all operating parameters automatically when power is reinstated after any interruption. The incubator shaker resumes its previous temperature set-point, oscillation speed, and timer state without requiring manual reprogramming protecting long-duration microbial culture, biochemical assay, and fermentation runs from the restart delays and protocol deviations that would otherwise result from an unplanned power event. This function is particularly important for overnight or multi-day shaker incubation protocols where operator attendance is minimal.

TECHNICAL SPECIFICATIONS

Desktop Incubator Shaker - ToronShake™ IS-D Series Technical Specifications

Parameter	ToronShake™ IS-170D	ToronShake™ IS-270D	ToronShake™ IS-245D	ToronShake™ IS-218D
Chamber Volume	70 L	70 L	45 L	18 L
Control Mode	P.I.D			
Display	LCD (set and actual values)			
Drive Mode	Single Shaft Drive			
Oscillation Mode	Orbital			
Driving Motor	Brushless DC Motor			
Temperature Range	5-60 °C	RT+5 to 60 °C		

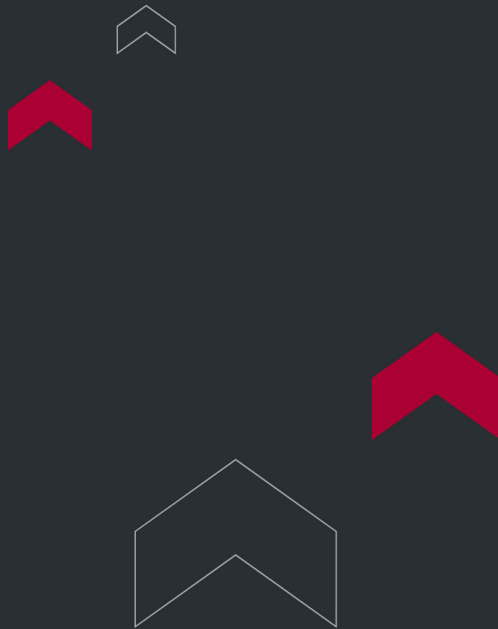
Parameter	ToronShake™ IS-170D	ToronShake™ IS-270D	ToronShake™ IS-245D	ToronShake™ IS-218D
Temperature Resolution	0.1 °C			
Temp. Uniformity at 37 °C	±1.0 °C			
Rotation Rate	30–300 rpm			
Amplitude	Φ0–40 mm (infinitely adjustable)			
Timer Range	0–999 min/h			
Rated Power	800 W	700 W	700 W	400 W
Housing Dimensions W×D×H	750×750×510 mm	750×750×510 mm	620×600×520 mm	470×450×420 mm
Tray Size W×D	440×390 mm	440×390 mm	400×370 mm	290×260 mm
Standard Configuration	250 mL × 10	250 mL × 10	250 mL × 8	250 mL × 5
Gross Weight	125 kg	115 kg	100 kg	59 kg
Net Weight	91 kg	81 kg	72 kg	44 kg
Packing Size W×D×H	890×910×720 mm	890×910×720 mm	800×800×710 mm	610×590×560 mm
Inner Chamber Material	Mirror Stainless Steel			
Observation Window	Toughened glass			
Alarm System	Intelligent audible and visual alarm			
Power-Off Recovery	Yes automatic parameter restore on power reinstatement			

Flask Configuration Reference

All models support multiple flask sizes. The table below lists standard and full-load configurations for each model.

Model	Standard Config (ml × pcs)	Full Load Configuration (ml × pcs)
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ToronShake™ IS-170D	250 × 10	50×31 / 100×31 / 250×15 / 500×10 / 750×8 / 1000×6
ToronShake™ IS-270D	250 × 10	50×31 / 100×31 / 250×15 / 500×10 / 750×8 / 1000×6
ToronShake™ IS-245D	250 × 8	50×23 / 100×23 / 250×13 / 500×9 / 750×6 / 1000×4
ToronShake™ IS-218D	250 × 5	50×9 / 100×9 / 250×6



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