TORONTECH

PRACTICAL WATER JACKET INCUBATOR

Practical Water Jacket Incubator – ToronCubator™ WJ-P

ToronCubator™ WJ-P is a water-jacket laboratory incubator engineered for applications where temperature uniformity and thermal stability take priority over refrigeration capability. Spanning four chamber volumes from 46 L to 247 L, this series of incubators uses tri-directional water-jacket heating wrapping the working chamber on both sides and the bottom to deliver exceptionally stable warmth with a temperature fluctuation of just ±0.2 °C at 60 °C.

For laboratories that culture cells, hatch specimens, or run long-duration biological assays at or near body temperature, the ToronCubator™ WJ-P provides the thermal inertia and consistency that conventional air-heated incubators cannot match.Unlike refrigerated laboratory incubators in the ToronCubator™ lineup, the WH series is a heating-only instrument. Its operating range starts from room temperature +2 °C, making it suited to warming applications rather than controlled cooling protocols.

The ToronCubator™ WJ-P is a water-jacket incubator designed for stable, uniform heating across a temperature range of RT+2 to 65 °C. The water-jacket principle surrounds the interior working chamber with a water-filled thermal buffer on both lateral walls and the base, creating a slow-response thermal mass that absorbs ambient fluctuations and door-opening events without significant set-point deviation. This makes the BG Series a reliable choice for incubation workflows where temperature spikes or drops could affect cell viability, sample integrity, or assay reproducibility.

The outer housing is constructed from cold-rolled steel with a static spray-plastic surface, while the interior working chamber uses mirror-finished stainless steel for easy cleaning and resistance to biological contaminants. Shelving positions are optionally adjustable to accommodate samples of different heights, and each model ships with a standard shelf configuration alongside a defined maximum capacity.

An LCD control panel manages both temperature set-point and run time, with an over-temperature alarm that flags exceedances before they affect samples. A low-noise fan mounted inside the working chamber supports air circulation across shelf positions for added temperature uniformity. The power recovery function retains all programmed data and run-state settings following any power interruption, protecting long-duration biological incubation runs from data loss and parameter reset.

APPLICATIONS

Practical Water Jacket Incubator – ToronCubator™ WJ-P Applications

The ToronCubator™ WJ-P is suited to heating-focused laboratory incubation applications where sustained thermal stability at or near physiological temperatures is the primary requirement. Its water-jacket design makes it particularly well-matched to protocols sensitive to short-term temperature disturbances.

- Cell & Tissue Culture: stable 37 °C incubation for mammalian cell lines, primary cultures, and tissue samples requiring minimal thermal disruption between access events.
- Microbiology: bacterial and yeast culture incubation at physiological or elevated temperatures where consistent warmth supports reproducible growth kinetics.
- Biochemical Assays: temperature-sensitive enzymatic reactions, hybridization assays, and protein folding studies that require sustained, stable heating across the full incubation period.
- Hematology & Clinical Labs: specimen warming, reagent pre-conditioning, and sample preparation at controlled temperatures for diagnostic workflows.
- Pharmaceutical Research: dissolution testing pre-warming, biological sample conditioning, and stability studies conducted at fixed physiological temperatures.
- Food Science: fermentation studies, yeast cultivation, and microbiological shelf-life testing at stable warm incubation temperatures.


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FEATURES

Practical Water Jacket Incubator – ToronCubator™ WJ-P Key Features

- Cold-rolled steel exterior with static spray-plastic finish; mirror stainless steel interior working chamber with optionally adjustable shelving
- LCD control panel for temperature set-point and run time management, with over-temperature alarm for active process monitoring
- Tri-directional water-jacket heating surrounds the working chamber on both lateral walls and the base, delivering superior thermal stability and minimal set-point deviation
- Low-noise fan mounted inside the working chamber supports uniform air circulation and consistent temperature distribution across all shelf positions
- Power recovery function retains all programmed data and run-state settings after any power interruption or system halt, protecting long-duration incubation cycles
- Temperature fluctuation of ±0.2 °C at 60 °C tighter than most air-heated laboratory incubators of comparable capacity
- Operating range of RT+2 to 65 °C covers physiological incubation through elevated-temperature biochemical assay conditions
- Four chamber sizes (46 L to 247 L) with scalable shelf configurations to match laboratory throughput requirements

THEORY & METHOD

Theory and Method

Water-Jacket Thermal Buffer Heating

The ToronCubator™ WJ-P uses a water-jacket heating principle in which a water-filled layer surrounds the working chamber on both sides and along the base. Electric heating elements warm the water, which in turn transfers heat evenly through the chamber walls. Because water has a significantly higher thermal mass than air, the water jacket acts as a thermal buffer absorbing minor temperature disturbances caused by door openings, ambient fluctuations, or varying sample loads and maintaining the internal set-point with a fluctuation of just ±0.2 °C at 60 °C. This makes the water-jacket incubator fundamentally more thermally stable than equivalent air-heated laboratory incubators of the same capacity.

LCD Temperature and Time Control

An LCD control panel governs the temperature set-point and run timer with a resolution of 0.1 °C. The display provides a real-time readout of both the current internal temperature and the elapsed or remaining run time. An over-temperature alarm activates when the chamber temperature exceeds the defined threshold, alerting operators before samples are exposed to damaging thermal excursions. The operating range of RT+2 to 65 °C covers the full spectrum of physiological incubation needs from room-temperature-adjacent sample storage to elevated-temperature biochemical assay conditions.

Fan-Assisted Air Circulation

A low-noise fan mounted within the working chamber circulates warm air across all shelf positions, supporting uniform temperature distribution throughout the interior volume. While the water jacket provides the primary thermal stability mechanism, the fan reduces residual air-layer gradients particularly relevant in larger-volume models (BG-160 and BG-270) where natural convection alone would produce greater variation between upper and lower shelf positions. The combination of water-jacket thermal mass and active fan circulation delivers consistent incubation conditions across the entire working volume.

Power Recovery and Data Protection

The BG Series includes a power recovery function that retains all programmed set-points and run-state data following an unexpected power interruption or controlled system halt. When power is restored, the incubator resumes from its last known operational state without requiring manual reprogramming. This is particularly valuable for long-duration cell culture, microbiology, or biochemical incubation runs where losing program settings mid-cycle could invalidate results or require a

complete restart.

TECHNICAL SPECIFICATIONS

Practical Water Jacket Incubator – ToronCubator™ WJ-P Technical Specifications

Parameter	ToronCubator™ WJ-46P	ToronCubator™ WJ-70P	ToronCubator™ WJ-160P	ToronCubator™ WJ-247P
Chamber Volume	46 L	70 L	160 L	247 L
Heating Method	Water-jacket (both sides + base)			
Temperature Range	RT+2 to 65 °C			
Temperature Resolution	0.1 °C			
Temp. Fluctuation at 60 °C	±0.2 °C			
Voltage	220V ±10%, 50Hz ±2% (110V is also available)			
Rated Power	430 W	630 W	1030 W	1530 W
Internal Dimensions W×D×H	310×380×450 mm	400×400×500 mm	550×500×650 mm	600×600×750 mm
Housing Dimensions W×D×H	460×510×765 mm	550×530×815 mm	700×630×965 mm	750×730×1065 mm
Shelves (Standard / Max.)	2 / 4	2 / 4	3 / 5	3 / 6
Net Weight / Gross Weight	40 / 48 kg	49 / 58 kg	80 / 98 kg	95 / 115 kg
Package Size W×D×H	580×620×910 mm	670×640×960 mm	830×750×1120 mm	890×860×1260 mm
Refrigeration	None (heating-only instrument)			

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