



TORONTECH

HOT AND COLD THERMAL CYCLING TESTERS - TORONTCT™



Thermal Cycling Testers ToronTCT™ Series are designed to assess the leak resistance of composite pipes and fittings. These testers simulate specific cycling conditions under controlled internal pressure to ensure reliable performance.

APPLICATIONS

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Main Components

1. Sample chamber
2. Premium quality 304 SUS cold water tank (with chiller & heat exchanger)
3. 316 SUS hot water tank with good quality heating elements
4. Electric control system

5. Flow measurement (option)
6. Pre-tension loading system (option)

FEATURES

Thermal Cycling Testers ToronTCT™ Series Features

Open Structure

1. High-temperature and high-pressure water are confined to the test sample and its connected pipeline.
2. The system operates under an atmospheric container design, ensuring other circulating pipelines, valves, sensors, and components function at atmospheric pressure, promoting long-term reliability.

Fully Closed-Loop Control

1. Equipped with an advanced digital control system for precise internal pressure management.
2. Automatically adjusts parameters like liquid temperature, operation time, flow rate, circulation pump, and control valve to maintain consistent internal pressure—even during alternating cycles of cold, hot water, or water hammer—exceeding national standards.

Intelligent Switching

1. The system intelligently manages cold and hot water tank controls based on inlet/outlet temperatures, liquid levels, and switching times.

2. Efficiently redirects unused cold water back to the cold water tank during transitions, minimizing temperature fluctuations ($<5^{\circ}\text{C}$) and reducing energy consumption.

Low Noise Operation

1. Features a proprietary water flow controller to significantly reduce noise caused by high-speed water flow.

Multiple Safety Protections

1. **Liquid Level Protection:** Multi-layer safeguards in cold and hot water tanks halt operations during water shortages to prevent pump damage.
2. **Transparent Shield:** A clear enclosure ensures user safety while allowing easy observation of test samples.
3. **Enhanced Alerts:** System notifications for issues like water shortages, broken samples, or unsealed doors prevent improper operation. On-screen prompts indicate abnormalities.
4. **Efficient Switching:** Transition time between hot and cold water cycles is under 1 minute, with a temperature difference at inlets and outlets kept below 2°C .
5. **Pre-Tensioning Device (Optional):** A robust frame with real-time load display via a ratchet pre-stressing mechanism.
6. **Maintenance-Free Valves:** High-heat-resistant materials eliminate the need for frequent valve seal replacements.
7. **Smart Water Replenishment:** Automates water addition to stabilize test temperatures and avoid manual intervention.

Advanced User Experience

1. **Interactive Touchscreen:**
 1. Full-color display integrates controls for pressure, flow, temperature, and time.

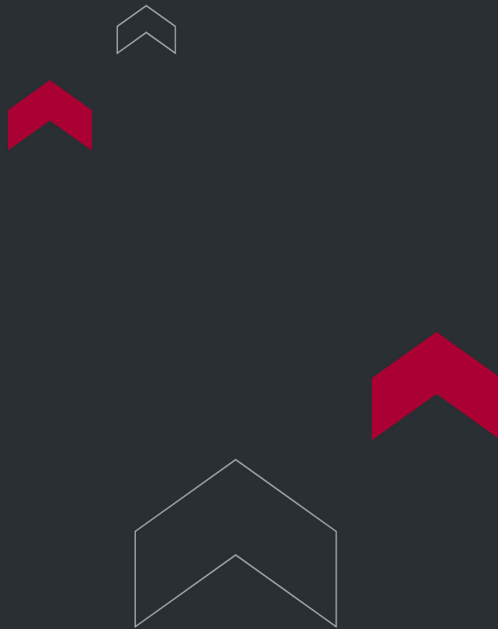
- 2. Automatically charts pressure-time, flow-time, and temperature-time curves with data stored on USB drives.
- 2. **Real-Time Data Collection:**
 - 1. Captures pressure, temperature, and flow data every 10 seconds, ensuring at least six data points during cycle transitions for precise analysis.
- 3. **Fault Detection:**
 - 1. Automatically identifies faults, highlights their locations, and provides actionable prompts.
- 4. **High Reliability:**
 - 1. Built on an industrial-grade programmable control system for superior safety and dependability in demanding environments.

TECHNICAL SPECIFICATIONS

Thermal Cycling Testers ToronTCT™ Series Technical Specifications

Specification	Details
Pressure Range	4.00 bar to 11.00 bar (0.4 MPa to 1.1 MPa)
Max. Pipe Outside Diameter	2 x 63 mm
Pressure Control Accuracy	±0.05 MPa
Number of Test Stations	6
Alternation Time Between Hot and Cold Water	No more than 1 minute
Cycle Period	300 s to 1200 s
Number of Cycles	Selectable 1-100000
Good quality 304 SUS Cold Water Tank	15°C to RT, Capacity: 800 L

Specification	Details
316 SUS Hot Water Tank	60°C to 95°C, Capacity: 800 L
Temperature Display Error	1°C
Temperature Uniformity	$\leq \pm 2^{\circ}\text{C}$



Torontech Inc.

251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada 

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC

601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA 

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE

Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE 

Phone: +971 488 19252
Email: me@torontech.com

