



**THERMAL
SYSTEMS**

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Laird Thermal Systems' PowerCycling PCX Thermoelectric Coolers Enable Rapid PCR Point of Care Testing

PowerCycling PCX Series thermoelectric coolers provide high reliability for demanding thermal cycling applications such as point-of-care PCR testing...

May 25, 2021 – Point-of-care testing allows medical staff to accurately achieve real-time diagnostic results within an hour, rather than days. PCR-based point of care testing is considered the gold standard for diagnosing COVID-19 because it provides the fastest and most accurate test results. Portable point of care testing (POCT) equipment requires a sophisticated thermal management solution that can withstand mechanical stresses induced by rapid temperature changes. The PowerCycling PCX Series is designed to handle hundreds of thousands of thermal cycles, providing improved performance and long-life operation in PCR testing applications.



PCX Thermoelectric Coolers enable faster point of care diagnostic testing



POCT is typically accomplished using portable handheld devices or small benchtop analyzers that utilize thermoelectric coolers for precise temperature control. Modern thermocyclers used for real-time PCR testing require up to 40 thermal cycles to create millions of strands of DNA sequencing for analysis. Thermal cycling creates a harsh environment for standard thermoelectric coolers due to the mechanical stresses that occur during the heating and cooling cycles. Standard thermoelectric coolers are not designed to withstand the rapid thermal cycling, shortening the operating life of the component. The miniaturization of point of care testing devices makes thermal management even more challenging.

The PowerCycling PCX Series offers a unique robust construction with a flexible thermally conductive “soft layer” to reduce mechanical stresses in thermal cycling applications. The highly reliable PCX Series extends the mean time between failure (MTBF) of point of care equipment, lowering the total cost of ownership.

“The PCX thermoelectric cooler is assembled with next-generation materials to boost performance over standard product offerings, said Andrew Dereka, Product Director at Laird Thermal Systems. “By achieving faster temperature ramp rates, PCX thermoelectric coolers provide greater throughput and faster test results.”

The PCX Series offers high heat pumping capacities from 13 to 215 Watts in various footprints as small as 15 x 15 mm to accommodate compact point of care testing equipment. To achieve precise thermal control, an array of PCX thermoelectric coolers is installed under the sample cartridge. The thermoelectric cooler is built with enhanced process controls to operate in temperatures up to 120°C, exceeding requirements for applications like real-time PCR testing.

For more information on the PCX Series, visit

<https://www.lairdthermal.com/products/thermoelectric-cooler-modules/peltier-thermal-cycling-pcx-series>

To learn more about thermal management for PCR point of care testing equipment, download our [application note](#).

About Laird Thermal Systems

Laird Thermal Systems designs, develops and manufactures thermal management solutions for demanding applications across medical, industrial and telecommunications markets. We manufacture one of the most diverse product portfolios in the industry, ranging from active thermoelectric coolers and assemblies to temperature controllers and liquid cooling systems. With unmatched thermal management expertise, our engineers use advanced thermal modeling and management techniques to solve complex heat and temperature control problems. By offering a broad range of design, prototyping and in-house testing capabilities, we partner closely with our customers across the entire product development lifecycle to reduce risk and accelerate time-to-market. Our global design, manufacturing and support resources help customers shorten their product design cycle, maximize productivity, uptime, performance and product quality. Laird Thermal Systems is the optimum choice for standard or custom thermal solutions.

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