Cryostation® s200 Heat Load Map

Applicable Products	Cryostation® s200		
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Purpose

This document is intended to explain the heat load vs temperature capabilities of the Cryostation® s200 when used with a Coolpak 2000e helium compressor.

Background

The tradeoff between additional heat load and base temperature of a cryostat is based on the cooling capacity (also called cooling power) of the system. Cooling capacity dictates the amount of additional wiring (DC, RF, etc.) and accessories that can be brought into the cold space while maintaining the same base temperature. The Gifford-McMahon cryocooler and the Coolpak 2000e helium compressor both help to improve the Cryostation® s200's cooling capacity with increasing heat loads. The higher the system's cooling capacity, the better it can maintain the same base temperature with an increased heat load (up to the point that the heat load exceeds the system's cooling capacity).

Applicable Theory

The Cryostation® s200 has base specifications of >75mW of cooling capacity at 4.2K. This allows for combinations of up to 25 DC lines and numerous RF lines to be used in the system, as well as a variety of sample mounts, all while maintaining a low base temperature. The s200 is highly customizable with 6 configurable vacuum feedthrough side panels. Figure 1 shows the effect additional heat load has on the base temperature of the system.

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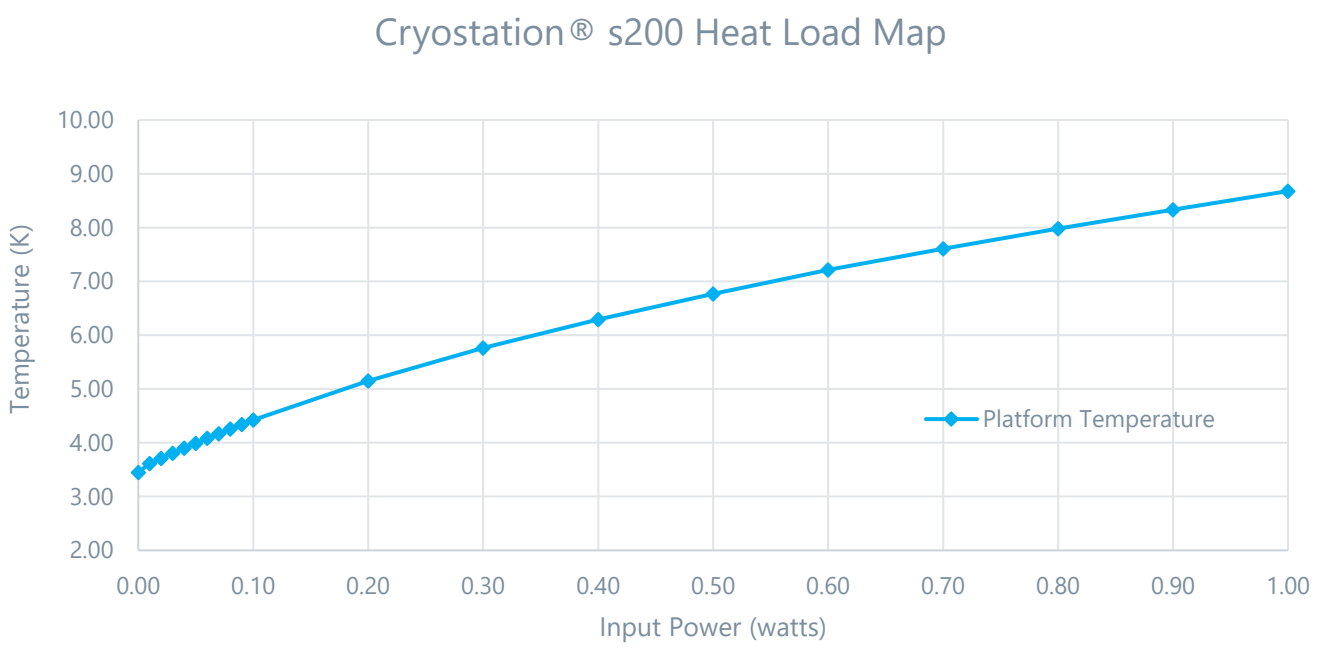


Figure 1: Heat Load vs Base Temperature on the Cryostation s200

The tradeoff for an increased heat load is an increase in base temperature. Higher temperatures can be minimized with proper wire management and routing is followed.

Summary

The Cryostation® s200 is a highly customizable 4.2K cryostat system. This allows for the addition of DC, RF, Fiber, nanopositioners, and sample mounts to be configured for the system. To learn more about the Cryostation® s200, contact a Montana Instruments sales engineer.

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