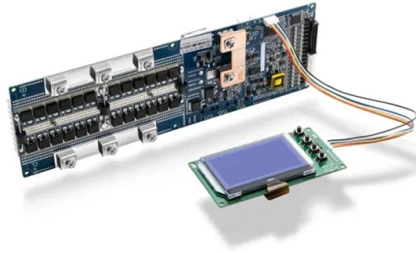


AI Server Cooling Connector



Article Overview

AI server cooling connectors are precision-engineered components that enable reliable, high-performance liquid cooling for high-density AI servers and GPU clusters.

Overview

AI server cooling connectors are critical components in liquid cooling systems designed for high-density AI and HPC environments. They ensure efficient heat dissipation from GPUs, CPUs, and other high-power components while maintaining leak-free operation under high pressure conditions. These connectors are essential in modern AI data centers where air cooling alone cannot handle power densities exceeding 100 kW per rack.

Design and Materials

- **Material:** Typically made from 316L stainless steel for superior corrosion resistance and durability.
- **Precision:** Manufactured using 5-axis CNC machining with tolerances of ± 0.005 mm on critical sealing surfaces.
- **Surface Treatment:** Passivation enhances resistance to coolant chemicals and environmental factors.
- **Thermal Performance:** Thermal conductivity around $16.2 \text{ W/(m}\cdot\text{K)}$, supporting operating temperatures from -40°C to $+120^{\circ}\text{C}$.

Functionality...

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Figure 1. Simplified AI data center liquid cooling architecture showing cold plate quick disconnects, blind-mate rack

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Executive summary Many AI servers with accelerators (e.g., GPUs) used for training LLMs (large language models) and inference

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Designing fluid connections for AI-driven data centers

Microchips are now enveloped in cold plates and connected through hoses and liquid cooling connectors to an outer

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://greatpremiersolutions.co.za>

Email: sales@greatpremiersolutions.co.za

Phone: +27 82 914 3675

Address: Unit 5, Silicon Heights, 22 Electron Avenue, Cape Town, 8001, South Africa

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