

Two-Phase Vs. Single-Phase: A Direct-to-Chip Comparison



Direct-to-chip is increasingly seen as the required standard in data center cooling. But one choice remains: single-phase or two-phase? Discover why two-phase direct-to-chip delivers the clear competitive edge for mission critical cooling across these key metrics.

Single-Phase		Two-Phase
Lower upfront cost, but requires frequent monitoring, flushing, and replenishing	Fluid Cost	Slightly higher upfront cost, but zero maintenance is required
Requires quarterly inspections and annual replacements	Filter Change	Designed to last for lifetime of CDU
Approx. 1.5LPM/kW to keep up with current-gen AI GPUs	Flow Rate	.5LPM/kW, reducing risk of corrosion and leakage caused by higher flow rates
10-20°C, on average	Cold Plate ΔT	0°C, due to phase change
Higher total cost of ownership	5-Year TCO	8-17% savings; validated by Jacobs Engineering

