PRODUCT SPEC SHEET NeuCool[™] 2-Phase Direct-to-Chip In-Rack System (IR80)

PRODUCT OVERVIEW

The NeuCool IR80 is a highly engineered two-phase, direct-to-chip system that delivers 80kW of liquid cooling through reliably superior heat removal for current and future generations of CPUs and GPUs.

We proudly designed a product, solution, and services program that delivers peace of mind throughout the liquid cooling journey. Basically, we've thought of everything.

WE'VE GOT YOU COVERED



Today

We make every day easy.





We've thought ahead.

NeuCool's two-phase, direct-tochip technology is built for the future, handling extreme heat densities that next-generation chips demand. Tested up to 4500W per socket, it can effortlessly remove average heat fluxes of 250W/cm² and hot spot heat fluxes above 500W/cm².

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NEUCOOL.



We've got your back.

We're more than a cooling provider. With an industry-first warranty, backed by a top US insurance company, we protect you from leaks—turning potential disasters into minor inconveniences. Unlike singlephase systems, NeuCool's nonconductive fluid ensures your electronics stay safe, even when leaks occur.

SYSTEM OVERVIEW

NeuCool Reservoir

- Provides refrigerant expansion volume to respond to fluctuations in compute power
- Creates head pressure that extends pump life and prevents flow instabilities
- Redundant level sensors that enable leak detection system
- Options that mount in rack or on top of rack

NeuCool Vaporators

- Direct-to-chip system promotes nucleation (boiling) and efficient heat removal from CPUs & GPUs
- Capable of cooling 4500W per socket
- Internal hard tubing configured to popular high-performance OEM servers

NeuCool Manifolds

- Aluminum manifolds direct refrigerant between servers and NeuCool iCDU
- Split design for installation flexibility, optimized flow, and heat isolation
- Low profile for rear aisle serviceability
- Aluminum dripless quick disconnects

Intelligent Coolant Distribution Unit (iCDU)

- NeuView[™] delivers **OpenBMC-based** Embedded Controls
- Contains industrial condenser, N+1 pumps, system sensors, and touchscreen control system
- Hot-swappable pumps, power supplies, and core logic board
- Interface to facility water system or alternative waterless systems (e.g., dry tower)

ENGINEERED FOR EXCELLENCE

Key Features

- Tested up to 4500W per socket and heat fluxes up to 500W/cm²
- Non-conductive, dielectric, waterless fluid with a ~1 GWP and 0 ODP
- Thermal uniformity across chip, eliminating hot spots

More Reasons to Choose NeuCool

- Multiple redundancies with hotswappable serving
- Industrial condenser with isolated facility water loop uses warm (ASHRAE W45) or chilled water
- 7" touchscreen for monitoring and control of NeuCool system
- Multilayer nylon AC hosing from servers to manifolds
- Majority of field repairs and maintenance do not require an HVAC technician
- Standard data center compatibility means quick installation and training
- Zero risk of water coming in contact with electronics, eliminating risk to GPUs

Take A Look



PRODUCT SPECIFICATIONS

Overall System		NeuCool Vaporators	
Cooling Capacity*	80kW+ direct per rack (100kW total) 4500W+ per socket	Materials and Construction	Copper (skived) baseplate, aluminum housing
Targeted Heat Removal	All heat from CPUs & GPUs; 75-80% of total server heat	Internal Server Plumbing	Industrial-grade, rigid copper or aluminum
		Fittings	Aluminum compression fittings
Typical Thermal Resistance	<0.020 °C/W (at vaporator level)	Compatibility	Available for most high-performance CPUs and GPUs
Total System Power Consumption	<1.0kW	NeuCool Management System (NeuView [™])	
Power Supply	120/240VAC and 480VAC at 50/60 Hz, N+1 phase redundancy	Overview	Multiple system sensors deliver data, reports, alarms, and updates to NMS and DCIM
Rack/System Sizing	Compatible with 42U-52U racks, 600mm+ width x	Communications and Integrations	SNMP, IPMI, Redfish, DCIM integration
Reliability	Redundant power supplies, pumps, core logic, and sensors	Leak Detection	Multi-level leak detection and reporting (alarm, alert, or report)
Serviceability	Hot-swappable main power supply units (PSUs),	NeuCool Refrigerant	
Plumbing	Brazed/welded stainless steel or copper tubing; industrial, 5-layer nylon braided hoses; aluminum dripless quick connects	Туре	IT-safe dielectric
		Safety	ASHRAE A1 rating, non-toxic, non-flammable, non- conductive, non-corrosive
Enterprise-Grade Services	Ascent program guides customer in journey to 2PDTC cooling; NeuGuard program offers best-in- class warranty & configurable professional services programs	Sustainability	~ 1 Global Warming Potential (GWP), zero ozone depletion potential (ODP)
		Volume in System	40x less refrigerant than immersion
NeuCool iCDU		Operating Pressure and Flow Rate	Low pressure; 4-9x less flow rate than single-phase DTC
Purpose	Control unit for NeuCool system; monitors and regulates pressure, flow, temperatures, etc.	Leak Damage Potential	Zero. Dielectric will not damage servers or IT gear in unlikely event of a leak
iCDU Placement	Bottom 7U of server rack		
iCDU Dimensions	35.9"L x 19.2"W** x 12.2"H (7U) (**bezel width; chassis width is 17.4")	Facility Water (FW)	
iCDU Weight	<200 lbs (<91 kg)	Location	FW only enters the iCDU and passes through the condenser; can be replaced with refrigerant loop for waterless applications
Display and Access	7" LCD touch display for local system interface, controls, and programming	Flow Controls	Characterized Control Valve (CCV) controls flow rate of FW
Pumps	3 industrial-rated pumps with N+1 redundancy; hot- swappable	Temperature	Compatible with ASHRAE 45 and below, depending on kW load
Condenser	High-performance brazed plate heat exchanger	*Dependent on incoming facility water temperatures ranging from ASHRAE 45 and below.	

NeuGuard[™]Support & Warranty Program

Bolstered by a highly responsive network of professional service team members, our industry-first NeuGuard multi-year warranty is underwritten by one of the largest U.S. commercial property and casualty insurance companies, providing defined warranty back-up coverage during the unlikely event of a leak.

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