

ZetaFrame® Integrated with ZutaCore® HyperCool® Direct-to-Chip Liquid Cooling (HRU-Air)

ZutaCore® HyperCool® offers an innovative two-phase, direct-to-chip liquid cooling solution for high-performance AI/GPU applications, seamlessly integrated with Chatsworth Products' ZetaFrame® Cabinet System.

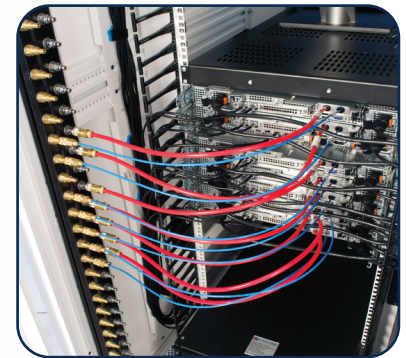
This cutting-edge combination provides precise cooling directly at the processor level, effectively managing the most demanding heat loads, including processors exceeding 2800W[†]. The system ensures optimal performance with zero throttling, enabling sustained high efficiency even under the most intensive workloads.

KEY FEATURES

- **Direct-to-Chip Technology:** Efficiently cools the most powerful processors with self-regulating, on-demand cooling.
- **Enhanced Integration:** Seamlessly integrates with CPI's ZetaFrame® Cabinet System for simplified deployment.
- **Future-Ready Capability:** Engineered to meet next-generation Thermal Design Power (TDP) requirements for high-density workloads.
- **Waterless Technology Cooling System Loop:** Closed-loop cooling system that uses a non-conductive, non-corrosive fluid to eliminate the risk of electronic damage in the event of a leak.
- **Maximized Space Utilization:** Delivers high-density performance with increased watts per square ft.
- **Optimized Energy Efficiency:** Minimizes energy consumption for sustainable and cost-effective operation.
- **Lower TCO:** Accelerates deployment time and reduces operational costs, while minimizing energy consumption, and delivering the highest sustained performance.
- **Reduced Carbon Footprint:** Lowers energy consumptions and enables 100% heat reuse, supporting sustainability and net-zero goals while significantly reducing CO2 emissions.



Front view of CPI's ZetaFrame Cabinet System integrated with ZutaCore Heat Rejection Unit (HRU-Air)



Rear View - Manifold Installation

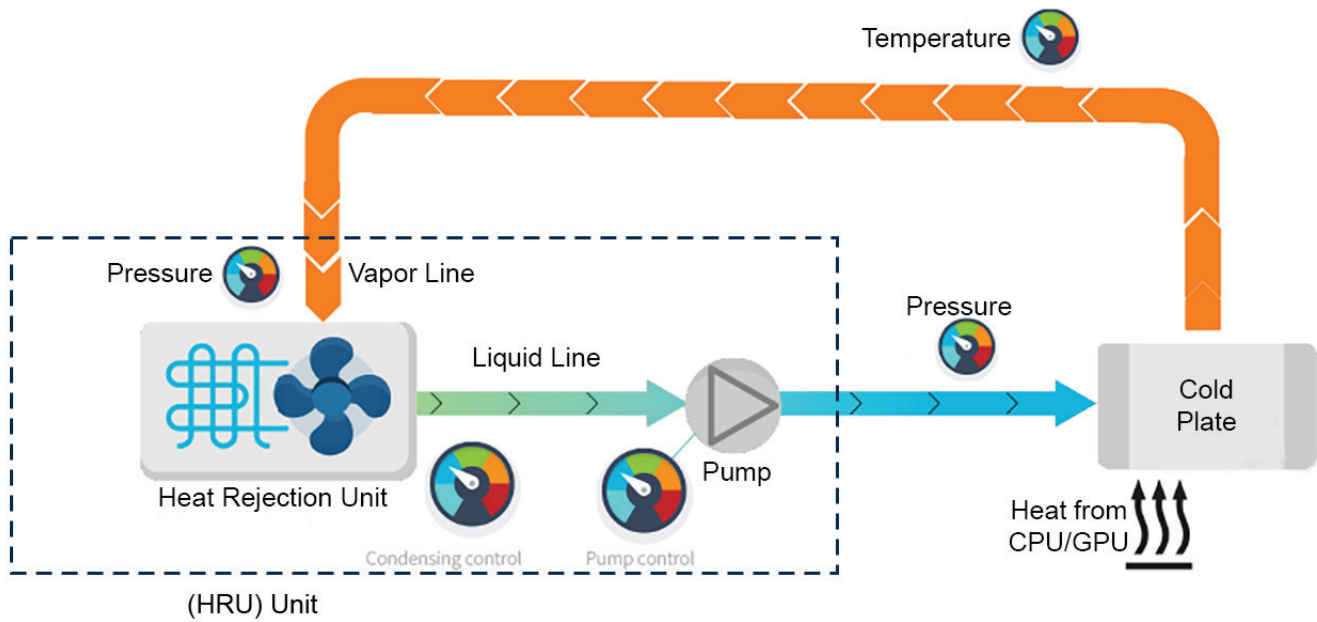


Front View - 6U HRU-Air

Availability: US, Canada, Latin America, Europe, Middle East & Africa

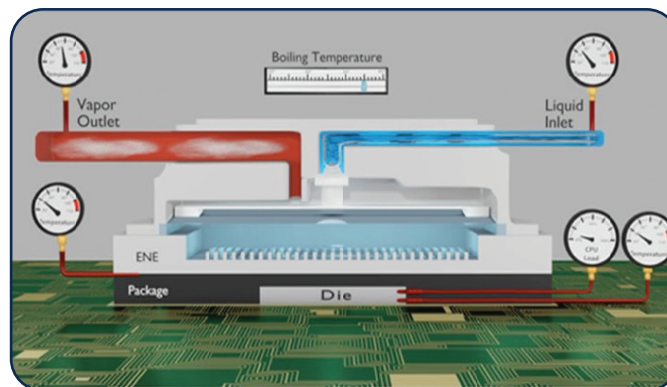
[†]Source: zutacore.com/solutions

ZUTACORE HYPERCOOL SOLUTION OVERVIEW:



ZutaCore Two-Phase Cooling Loop Features:

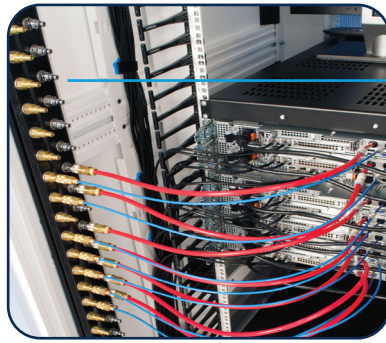
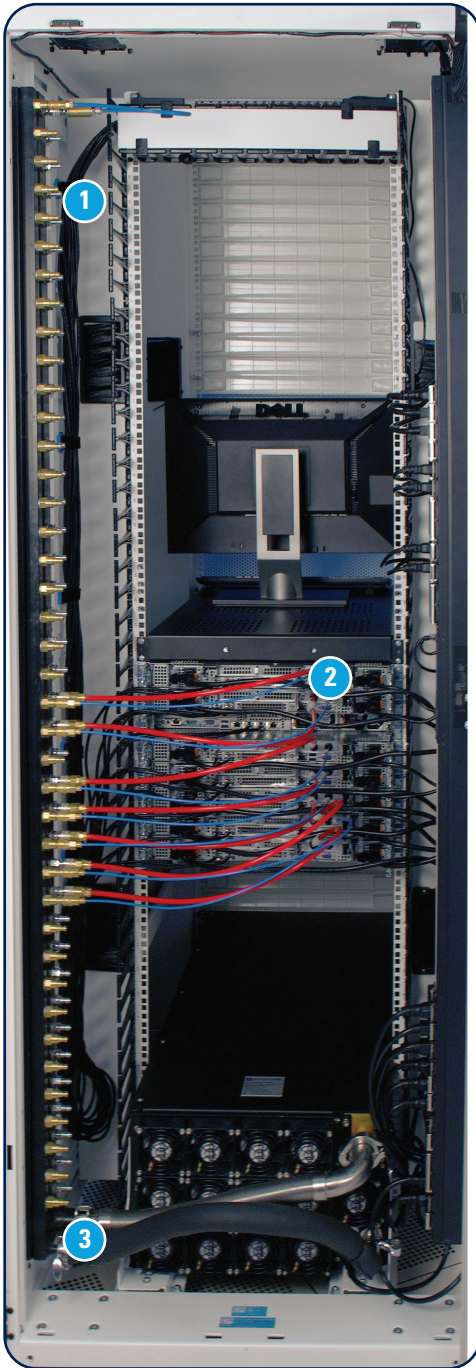
- ✓ Direct-to-chip, two-phase, on-demand cooling
- ✓ Dielectric coolant (non-conductive, non-corrosive, environmentally friendly)
- ✓ Liquid turns into vapor = 10X more efficient than single-phase LC
- ✓ Each cold plate is connected in parallel and self-regulated
- ✓ Closed-loop system
 - Controls pressure regardless of elevation
 - Significantly reduces maintenance relative to open-loop systems



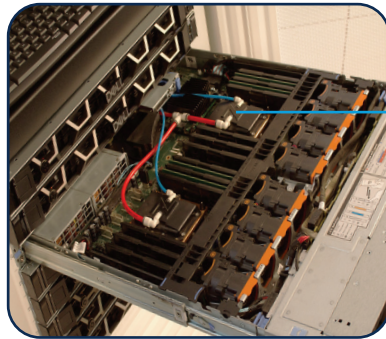
Section view of the cold plate and the chip.

KEY COMPONENTS:

ZutaCore Hypercool consists of the following sub-systems:



1 ZutaCore HyperCool Manifold:
Self-contained manifold effectively distributes heat transfer fluid between the HRU and devices.



2 ZutaCore HyperCool Cold Plate (Server Kit):
Assembled onto heat emitting components such as CPUs and GPUs.



3 ZutaCore HyperCool Heat Rejection Unit (HRU-Air): A self-contained system placed inside 19" cabinet which can manage compute densities up to 20 kW total thermal load.



4 ZutaCore HyperCool Service Unit:
Utility service unit used to pump liquid coolant into the HRU and to purge non-condensable gases out of the system.



6 ZutaCore HyperCool Support Kit:
Utility service unit used to pressure-test the system.

HEAT REJECTION UNIT (HRU-AIR) OVERVIEW:

The ZutaCore HRU-Air unit is a high-performance heat rejection solution tailored for data centers that utilize air-based cooling infrastructures and do not have access to a water loop. This innovative unit effectively dissipates heat from the liquid cooling system to the ambient air, delivering exceptional cooling performance for high-density applications. The HRU-Air is engineered to meet the needs of air-cooled facilities managing significant thermal loads that require liquid cooling for high-TDP CPU/GPU equipment, ensuring maximum energy efficiency and operational reliability. As a scalable and adaptable cooling solution, the HRU-Air unit supports modern data center requirements, enhancing overall performance while optimizing energy usage.

The 6U HRU-Air air can support up to 20 kW total rack power.

Note: The waterless technology cooling system loop between the HRU and cold plates is waterless.

FEATURES

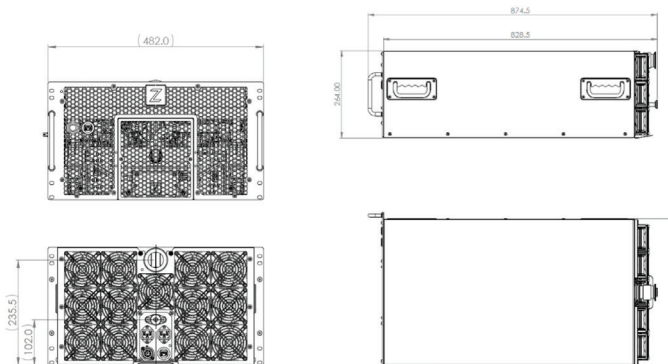
- 19" x 6U rack mountable unit
- Supports up to 20 kW rack power
- Use of a non-conductive refrigerant
- Low pressure < 3 bar
- Monitor operations and control adjustments via a touch screen interface or over the network
- N+1 redundancy of pumps
- Field replaceable option (in rack) of electronic and power components

ADVANTAGES

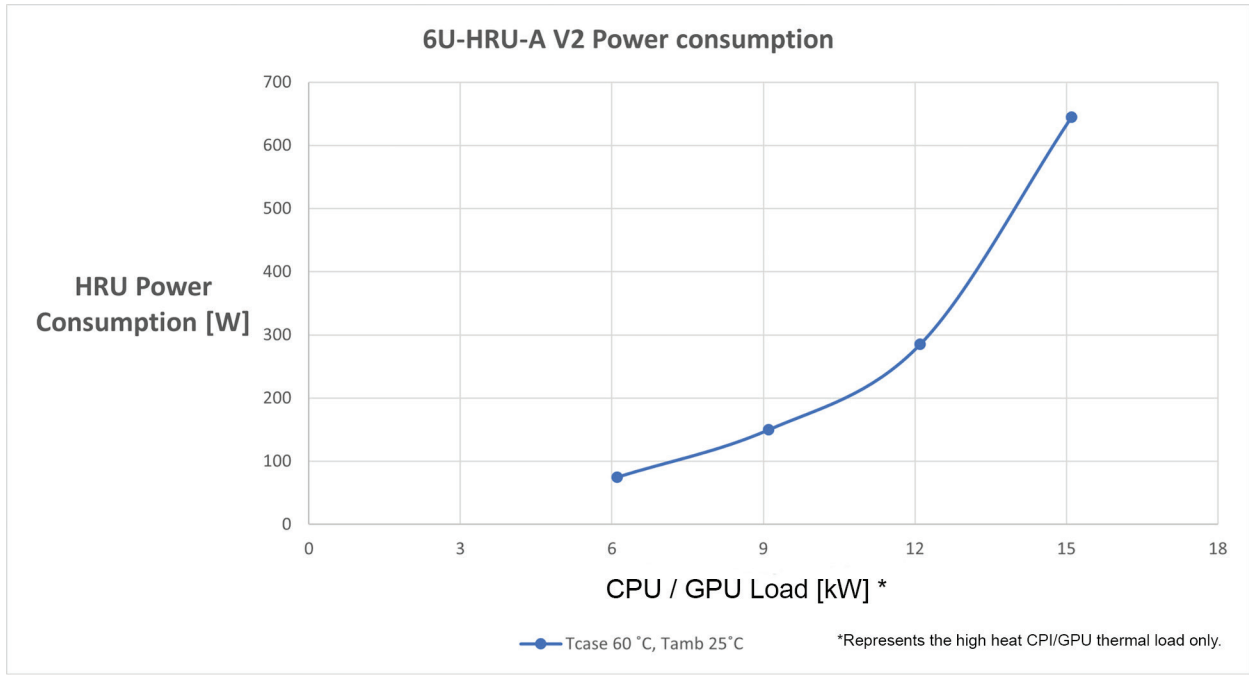
- Fully automatic operation, analysis, and adjustments
- Quick and easy installation with minimal setup
- Safe, non-conductive, non-corrosive heat transfer fluid. Additionally, it has an ozone depletion potential (ODP) of 0 and a very low global warming potential (GWP) of 2 or less, depending on fluid selection.

6U HRU-Air Specifications			
<ul style="list-style-type: none"> • Standalone system, no facility infrastructure needed • All wetted materials are dielectric refrigerant compatible 		<ul style="list-style-type: none"> • Cooling capacity supports up to 20 kW rack power 	
Environmental			
Overall System		Refrigerant	
Operating temperature:	5°C - 45°C (41°F - 113°F)	Type:	Dielectric Refrigerant
Max working pressure:	3.2 bar	Temperature working range:	-76°C - 65°C (-106°F - 149°F)
Humidity:	20% - 70%	Buffer tank capacity:	6L
Waterproof rating:	NEMA Type 1	Safety:	Non-conductive, non-corrosive, non-flammable, non-toxic
		Environmental properties:	Zero ozone depletion potential, low global warming potential of 2 or less
Pipe and Electrical Connections			
Vapor and Liquid Tube Connections - Type and Diameter		Electrical Connections - Electrical and Communications	
Vapor Inlet:	Tri-clamp 1½" flange	Power Connections:	N + 1 phase redundancy 120-340 VAC at 50/60 Hz (120 VAC by special order)
Liquid Inlet:	Tri-clamp ½" flange	Power Consumption:	<650W

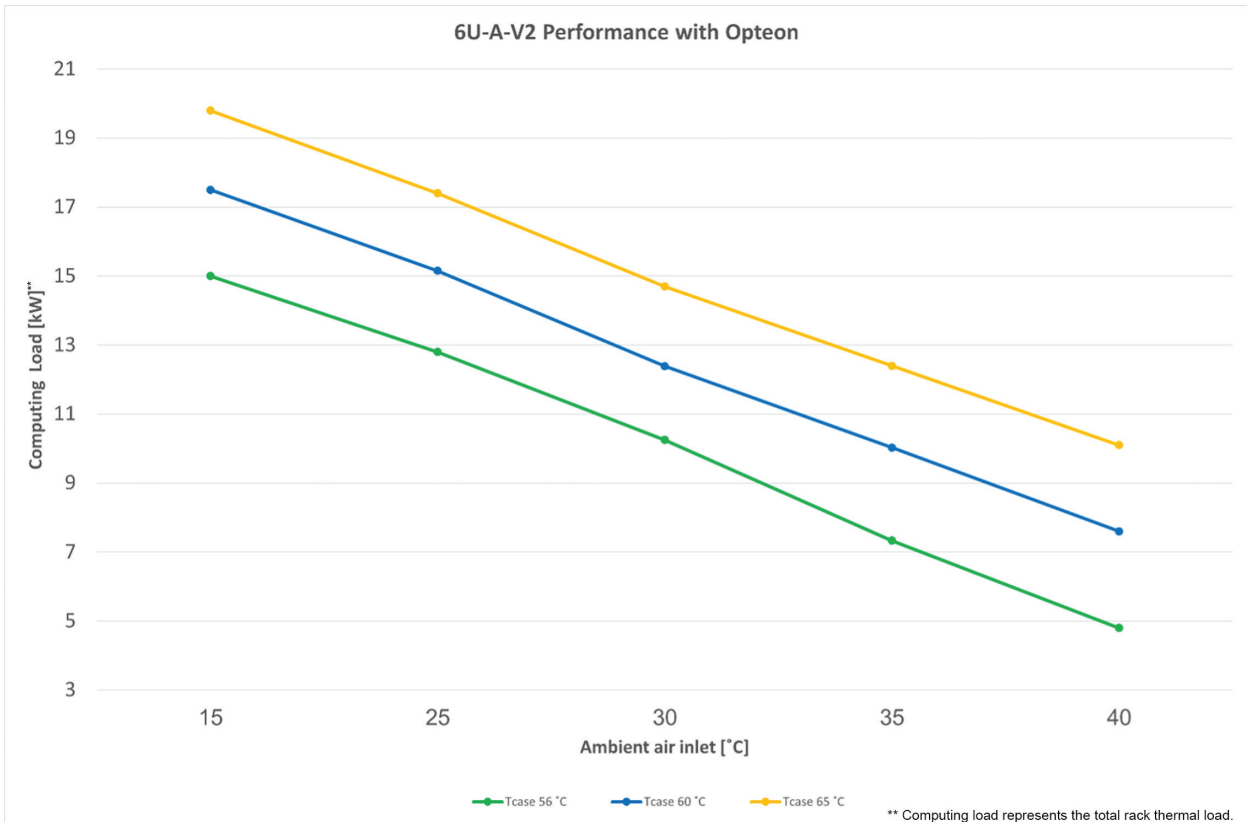
Physical Dimensions:	
Width:	482 mm (18.98")
Length:	874.5 mm (34.4")
Height:	264 mm (10.4")
Weight:	55kg (132 lbs.) dry
Certifications & Compliance:	
6U HRU-Air V2	CE and CB System certified RoHS compliant REACH compliant
Manifold	RoHS compliant REACH compliant



POWER CONSUMPTION GRAPH:



MAXIMUM COMPUTING POWER GRAPH:



HOW TO BUILD: CPI Integration

ZetaFrame Cabinet configured with:

- High power eConnect PDUs
- Monitoring and access control
- Cable Management
- ZutaCore Heat Rejection Unit (HRU)
- Manifold(s)
- Liquid and Vapor Lines
- Shock Pallet and Packaging Kit

HOW TO BUY: Sample Bill of Material

Example Bill Of Materials (BOM)			
Item	Part Number	Description	Qty.
1	TSxxxxx1	ZetaFrame Cabinet; 48U X 800W X 1200D; Two Pair 19" EIA Square-Punched Rails; Top Panel; Caster Kit; Leveler Kit; Perforated Metal Door, Single-Point Swing Handle Latch; Double Perforated Metal Door; Three Point Swing Handle Latch; Solid Side Panels; Air Dam Kit; Solid Bottom and Support Kit for ZutaCore System; (2) Short Finger Vertical Cable Managers: Rear-Right and Left; (2) Cable Lashing Panels, 2.75"W (70MM) with Cable Bundle Swivels Install; Rear-Left & Right; (1) Switched eConnect PDU, Black Finish, 220- 240/380-415V, 60/63A, IEC 60309 60/63A 3P+N+E Input Plug with 10' Power Cord, 34.5KW, (30) C13 +(12) C19, Secure Array IP Consolidation, Phase Balance Locking Outlets, Field Replaceable Controller Install: Rear Left (Cord up); (1) Switched eConnect PDU, Glacier White Finish, 220- 240/380-415V, 60/63A, IEC 60309 60/63A 3P+N+E Input Plug with 10' Power Cord, 34.5KW, (30) C13 + (12) C19, Secure Array IP Consolidation, Phase-Balanced Locking Outlets, Field Replaceable Controller Install: Rear Right (Cord up); (2) Full Height PDU Mounting Brackets Left and Right; (1) ZutaCore Manifold 42U Length Installed Right Rear Corner; (1) 6U-ZutaCore HRU-W Option Installed; Packaging Kit with Shock Pallet	10
2	TSxxxxx2	ZutaCore Accessory OPTEON SF33 Specialty Fluid Drum 23 KG	10
3	TSxxxxx3	Support Kit Unit	1
4	TSxxxxx4	Service Unit	1
5	TSxxxxx5	Server Kit, DELL XE9680, SPRX2, H100X8, NVLINKX4	10
6	TSxxxxx6	Server Kit, DELL R660, SPRX2	100
7	TSxxxxx7	SDC BASE License for HRU Monitoring	10
Recommended Accessories			
8	34538-E02	Snap-In Filler Panel, 2U, Glacier White, 50 Pack	4
9	34537-E02	Snap-In Filler Panel, 1U, Glacier White, 50 Pack	1
10	39150-001	Leveling Feet Height Adjustment Tool, 5 mm Hex Ball Driver, 12" L	1

SAMPLE

The advanced features of the ZutaCore and ZetaFrame solutions work together to address the evolving challenges of data center cooling and performance. With the right infrastructure in place, your data center will be equipped for higher efficiency, greater density, and future growth.

For more information, please contact us:

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